THE LANCET

RNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS,
OLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

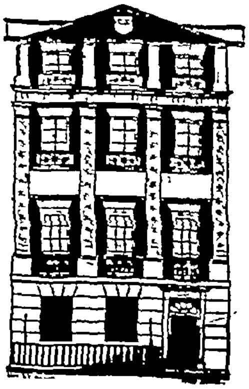
FOUNDED BY THOMAS WAKLEY IN 1823

VOL. No. CCLI

VOLUME TWO
JULY-DECEMBER
1946

EDITOR
T. F. FOX, M.D., F.R.C.P.

ASSISTANT EDITOR
E. CLAYTON-JONES, M.B.



PUBLISHED BY
THE LANCET LIMITED
7 ADAM STREET, ADELPHI, LONDON

CONCORDANCE

To enable the reader to determine at a glance the date and serial number of the issue of THE LANCET containing the required page reference

Pages	Date of Issue	No.
1– 36	July 6	6410
37– 72	„ 13	6411
73–108	„ 20	6412
109–148	„ 27	6413
149–184	Aug. 3	6414
185–220	„ 10	6415
221–256	„ 17	6416
257–292	„ 24	6417
293–332	„ 31	6418

Pages	Date of Issue	No.
333–368	Sept. 7	6419
369–404	„ 14	6420
405–440	„ 21	6421
441–476	„ 28	6422
477–512	Oct. 5	6423
513–550	„ 12	6424
551–586	„ 19	6425
587–626	„ 26	6426

Pages	Date of Issue
627–662	Nov. 2
663–702	„ 9
703–738	„ 16
739–778	„ 23
779–814	„ 30
815–854	Dec. 7
[illegible]55–890	„ 14
891–930	„ 21
931–966	„ 28

DEMOCRATIC NURSING

SOL. M. COHEN

M A. Cape Town, F.R.C.S.

It is one of the paradoxes of war that from its ughter, its cruelties, and its misery there often erges a new desire for freedom, tolerance, and equal portunity. This last war has made it vividly clear Government and people that if we are to get the st out of the worker, conditions in industry must be ppy.

Ours, in the phrase of Mr. T. B. Layton, is an "industry health." We have come more than ever to regard e sick man as a diseased individual, rather than as a se of the disease. We have come to accept, too, that e care of the patient needs team-work: doctor, nurse, d patient have their parts to play. In this paper hope to show that great changes are needed in the tlook and the rôle of the nursing staff if the best is to achieved.

The lack of nurses has drawn attention to this aspect our work, and the recent nursing charter is an attempt attract them into the profession by dangling in front them prospects of greater salaries and increased social enities. These are in themselves commendable, but my talks with large numbers of nurses and sisters have been impressed with the fact that they all feel at it is not the money which keeps the average girl om joining the profession. They don't even mind e discipline; women, in fact, seem to enjoy discipline; ey have entered with great zest into the marching and illing and routine disciplined life of the Services. ut they fear, in nursing, the cold unsympathetic ceptance of their aid by doctors and sisters: they e not welcomed in the true sense as part of a team. he very fact that the nurses do not urge their own ters and school colleagues to join them is our clearest idence of their dissatisfaction with their work.

I contend that the doctors are much to blame for the esent conditions; and the nursing profession, too, e not without their faults. There is some difference opinion these days as to what we mean by democracy, t for most of us in this country Plato's conception democracy still holds: "Every citizen has an equal ht to take a personal part in the government through assembly." That is team-work, and that is what ery nurse should feel she is engaged in.

OPINION OF THE DOCTORS

We doctors seldom bother to discuss with the nursing aff our proposed régime of treatment for the patient, to explain how we have arrived at our decisions. We eat them very much as if they were fools, incapable of derstanding, merely there to take orders and not to estion them. Our attitude is aloof, and our decisions e wrapped in mystery, as if we were inspired or super-tively clever. They are not admitted as true colleagues, esumably interested in the welfare of the case. Of urse this habit has spread to our treatment of the tients themselves, and there has recently been a timely tery against the growing practice of avoiding discussion sensible explanation to the patient of his troubles.

Nothing will fortify a patient more for his gastrectomy other abdominal operation than the reassurance of e nurse as she prepares him; but her talk must be unded on knowledge, otherwise it is [illegible] bluff prattle. Yet how little we tell the [illegible] most them do not even know what a modern gastrectomy ks like, nor how long it takes the stomach wound heal, though they are asked to arrange the post-erative feeding, and are ordered to give drugs, without ving learned much about their action, or of what [illegible] to watch for or to fear. Again, we are damnably inconsistent, and not so clever as we think. For years we filled people with intravenous salines, and no case of accident or major operation died without the use of a saline drip: now we think we may have killed some of them. We tanned all burns: now we think we were poisoning them. We gave everybody sulphonamides; now we suddenly find they are not quite miraculous. No wonder some of the girls think—but they seem scared to say it—that our opinions are often like soap-bubbles, one moment reflecting all earthly opinion, the next shattered into thin air.

TEACHING THE NURSE

Nor do we regard the teaching of the nursing staff as part of our duties. I believe that a doctor in a ward should know his nurses' names, just as the chief in the teaching hospital knows his ward clerks. They will feel that an interest is being taken in them, that their work is appreciated; and it will give them a desire to excel.

The nurse, like the doctor in training, needs teaching at the bedside. Senses, to become sensible, need the regular discipline of constant clinical teaching. Systematic teaching is something apart. The nurses have a legitimate grouse here too when they say that many of their medical teachers show apathy and lack of interest. Lecturing, particularly on anatomy and physiology, is palmed off on busy junior medical officers, who regard it as a nuisance and thank heaven when it is over. They deliver dry-as-dust lectures, straight from the nurses' standard textbooks, with nothing to enliven them but an ancient anatomical chart, and the usual skeleton dangling in its cupboard. When nurses are learning anatomy, visits to anatomical departments and teaching on the cadaver are essential. Lectures on medicine and surgery need more up-to-date methods. Many of the girls have never seen a gastric ulcer, have not the foggiest notion of the appearances of the ulcerated or carcinomatous colon, and have only seen the pneumonic lung in pictures. They need to see pathological specimens, lantern slides, and cinema films. First-class material of this kind should be obtainable from central depots. Their medical teacher should take them to see suitable cases illustrating his lectures; and the sister-tutor should be kept informed of the cases available, and should be able to take nurses into the wards to see such conditions as jaundice, uræmia, or meningitis. The nurses need to be taught more about the underlying principles of our treatment. Many of them—especially in these days when patients are grouped for convenience—spend months working only in medical gastric wards, carrying routine feeds and dishing out medicines, with no notion of the scientific reasons for this treatment. For a nurse to insist effectively that a patient must not smoke, she must know why smoking is forbidden and must be able to explain the reasons intelligently. We doctors seldom explain that point to the patient, as we should—but I need not confess to all our sins.

Teaching is time-consuming, and the teacher should be properly paid. True, Hippocrates enjoined us "to teach the art to such of them as wish to learn it, without payment or agreement"; but Hippocrates did not anticipate the rise and growth of our income-tax.

We must have a care in front of nurses. The doctor's life these days is busy, and bad habits and irritable moods grow like weeds on such a soil. The modern outpatient department, with its one great long rush, can be soul-destroying; the nurses find themselves used as valets handing the doctor his towels or other personal wants, and serving merely as a "standby" for female patients. They have no personal contact with the patient, there is rarely time to teach them anything, and they don't feel part of the team. Many outpatients are not in urgent need of attention, and we should adopt more generally a **system of sorting**, giving priority to urgent cases as was **done so** successfully on the battlefield. Some doctors have themselves to blame for much of their overwork. Outpatient medical staffs need to be larger and there are many willing to join the team if they are only given an opportunity.

We must control our bad clinical habits in front of the nurses: as a surgeon I can say that "wound peeping" and "wound squeezing" are catching. The custom of giving sleeping-draughts and aperients in hospital as a routine is to some extent responsible for the growing practice among the public of taking purges and sleeping-draughts (particularly barbiturates) regularly when they have no need of them. No wonder they gollop aspirin as if it were popcorn.

Finally, a busy life is apt to destroy tenderness and sensibility. We seem to be ashamed to show sentiment, and old-fashioned kindliness is looked down on; to fear for the patient courts the rebuke of timidity. This is a time of stocktaking in human values. To the young nurse, a human immediate personal approach to her patient is the very all: we must have a care not to blunt her natural tenderness.

SISTERS

We all of us honour the sisters of former times, who scorned delights and lived laborious days. They have been great under great difficulties—they were on the side of the angels, women of great character. Time and again one has heard of a sister the remark "she would have made a good wife." But it is not fair to expect women to sacrifice their whole existence and deny themselves the happiness of married life, and the happiness of children. In order to marry, however, they must have opportunities to find their mates; and though we need not act as marriage brokers, we must see to it that these girls have such opportunities in their social life. Marriage has hitherto robbed us of their hard-gained experience, judgment, and wisdom. It is always argued against their employment in hospitals after marriage, that in nursing "the night is joint labourer with the day." That is true; but if a doctor can work all day in hospital and go home to his fireside and his family, so can the sister of the ward.

The nursing charter has recognised this; under it, nurses will be getting good salaries, and will be able to afford extra help at home to attend to the house. A married sister could serve fully in the operating-theatre; and we all know how many years it takes to train that valuable member of the surgical team. Married sisters could also work in health centres, and I would urge that some of them should be trained in the simple routine duties of a laboratory technician. It will take them but a few months to learn to do hæmoglobin estimations, blood-counts, blood-ureas, and sedimentation-rates, and to examine urines and sputa microscopically. It is absurd to suppose that the testing of a urine is the only thing a highly intelligent girl is capable of. Is there any reason why sisters should not take routine blood-pressures? In fact, as our nursing staff increases (and I am optimistic) some of these technical duties could well become part of the ward sister's routine; it would broaden her interests.

In the outpatient department married sisters will be able to serve particularly well; they will know more about home conditions than single girls, and as mothers will sympathise with the woman who is fearing grave news, or wondering whether the doctor is going to order some fearful operation for her child.

Here I must cast a small kindly pebble at the sisters themselves. I would like to see them cast aside the present barrier of authority between themselves and the nurses. The girls are afraid of them—that is what they tell me. I would like to see a more *friendly* spirit and not a martial pose. I say "pose" because their mind in stern tradition's clothes when on their uniforms, as if that were the only authority. It is the way of the world to down the many facets of human character uniformity. But I am convinced that one dignity with the junior staff and at the friendly. One sees it time and again with surgeon, when he is laughing and joking, dining with his most junior medical officers, *on all the little things in life;* yet they will him and for him, and there is a fine team sp

"No star or planet has any cover before it," sa Aurelius.

I would like to see these sisters have tea girls, take them at least twice a day round fr bed, tell them about each of the patients, them the way to talk to sick people. It is thing to have to say that some of these sisters selves out of date, and that they don't rel of close questioning. That is not surprising, of them, after years of, say, fever or other special find themselves having to do general nursing, techniques, its advances, and altered methods ment. They are the first to admit that the welcome refresher courses, and one would more such courses arranged for them. The sister should be interchanged or encouraged to postgraduate or other teaching hospitals, so th come back refreshed with new ideas and bring to her hospital. There are scholarships for travel to other countries, and sisters sho similar opportunities. They need to have meetings, and to write papers (and many of *delightful sensitive* pens).

Of course, they need more freedom in their ow *the sisters seldom have opportunities of going* theatre and seeing what, for instance, the gastrectomy looks like. How can they nurse th really intelligently if they cannot even ima state of affairs within his abdomen? How many have been taught intelligently how wounds when an anastomosis within the peritoneum and completely healed? Nor am I in any way their good work when I say also that I should professional moat which encloses their care of th filled up—their growing belief that nursing is apart, and that the doctor should not intrude. tain that the doctor *ought* to know how to arrange how to give enemas, when to give aperients, how after backs. I hold up the words of Paré, "I a apothecary, and cook to my patient." The knows that to give a large enema, as is common can blow a purse-string on the cæcum or anastomosis. For many years, until Hurst in the enema tube was traditionally passed a long into the rectum where it merely coiled. The *enema—still so popular*—we now know stip mucosa with hæmorrhages and makes it swollen, angry. Even the ordinary soap enema of t as THE LANCET recently pointed out, has no ad whatever over water from the tap. The knee which a surgeon introduced some 20 years now know may be responsible for that great the pulmonary embolus.

These criticisms of traditional nursing techn no way detract from the great contributions to of the [illegible] made by the sisters themselves, es wherever there has been close team-work. know how much the changed methods of nursing head injury and the chest owe to the joint work o and surgeons. We all acknowledge the contrib the sisters in advancing theatre asepsis and tech and their great assistance in formulating the of ward dressing. I only want to point out that industry and accurate transcription of doctors' is not enough. They must be kept abreast of t advances.

THE TRAINING OF THE JUNIOR NURSE

ere was a time when nursing was regarded as a vocation, or the result of an antenatal urge for ort of work. Some there are with shallow surface who still maintain that if the nurse hasn't this al urge we don't want her. But my belief, after g to these girls, is that they hear the call of talent: have an innate knowledge of what they will excel what will give them pleasure and joy—and that all is the final test of achievement in any activity. uld deny that they are less sincere than their fore- rs in their tenderness and sympathy; they are red to work as hard for the very ill, and in my ience their desire to serve is as great.

e must remember they enter the wards young. t do they meet? Their welcome is certainly not rm one. Hardly ever introduced to the doctors, are handed the most menial of duties. come antly under the tongue of criticism, and are ulously sensitive lest they displease the doctor or Scorn and indifference can kill the sweetest and enthusiastic of souls; it is frost to the flower. have too much work to do to enjoy the pleasures e personal nursing of the patient. The nurse *must* time to linger, to talk and even gossip: that is way she will get to know the little whims, gather fears. Honest reassurance is a fundamental step estoring the patient's health: how much do we h her about how to talk to the patient—when to e him, when to encourage him, and even when to her part? We rely on her feminine intuition— tever that may be—in the handling of men. No can really talk intelligently and with assurance to patient unless she understands something of the ss. That is where we doctors have been so neglectful. do *not* explain to her in detail what is wrong, and t we want her to do; we are apt to chatter that a e learning may be dangerous, and that the girls ht be tempted to take on too much. The best way ure irresponsibility is to give responsibility.

should be our aim to attract the best types of girls, luding university graduates. The mould of their ure teaching is now being cast. I feel that in some ticulars the training of the nurse should be similar to t of doctors. Each junior nurse should have about personal patients per ward. She should write her n histories, and have full access to the doctor's notes; should not, as at present, have to scan them secretly. e patient is hers as much as ours. She should have add her comments—saying why she thought the liver ection was given, explaining the purpose of the fluid- rt, the significance of the vomiting. The sister-tutor uld correct these histories, and in the course of train- the student nurse would cover most types of case. take the history closely would not only teach her much out the disease but would stimulate her to turn to oks for a fuller account; she would no longer be ntent with the sketchy details given in some of her rrent textbooks. Besides, such histories would be great value to the doctor. The new patient is often mnoxed, and forgets to tell him many things; and ctors are not always able to see the relatives, particu- ly of children. If the nurses were trained to write tories, how helpful they could be.

As the doctor does his round, the junior nurse in charge each patient should be at the bedside; he could do ch to encourage her by telling her how neat the ient was, how happy he was with the care of the , so that she would get some satisfaction out of her work. "When men give up saying what is charming, they give up thinking what is charming."

The junior nurse should not be kept for many months in one ward, with one type of case. Museum methods of nursing treatment should not be taught nowadays, and examiners should certainly avoid them. The nurse can always look up antiquated methods, if they are demanded. The nursing and weekly medical journals should be readily available to her. She should be able to approach the doctor direct without quaking, and should be accepted as part of his society. Some nursing conditions seem to be unnecessarily unpleasant; we had better admit that some of the work we ask nurses to do we would not do ourselves. Ask the doctor to see a bedpan in a sluice-room and see how quickly he hops out; yet we expect these girls to accept old-fashioned equipment and unpleasant smells, and if they object, we taunt them with lacking the nurse's soul. We need to introduce generally—not, as at present, in relatively few hospitals—decent ways of disposing of the excreta, and proper equipment for the washing of the bedpans. Engineers would readily design apparatus to flush pans, and to do away with the need for all this hand-washing. Even the methods of ward cleaning are absurd in 1946, when every puny hotel has its vacuum cleaners. Floor-scrubbing machines are available and save much labour. Wards of 50 patients often have only one bath, which has to be shared by the patients with fistula-in-ano and many others with discharging and healing wounds. We are very much to blame for our facile acceptance and moral approval of these primitive methods.

ADMINISTRATION

It is a pity that the reward of good nursing is an administrative appointment. Administrators are a necessity, but with the years their administration is apt to become of the armchair type. The clinical workers may justifiably grouse that they are rarely consulted. Who but the surgeon can know whether his theatre nurse is suitable, amiable, and capable of adapting herself to the team? We learnt well in the war how much the man on the job can contribute. I need only quote the words of Disraeli: "Great minds have failed because they have wanted to think alone, and disdain the study of the mass of men."

There is need for regular round-table administrative meetings with sisters' and nurses' representatives present. Let them feel that they are taking an equal part in the running of the hospital; they will be proud of its good name, and do all they can not to let their side down. Such conferences will besides offer an outlet for their grievances. They would also settle the nurses' ward appointments, and decide on those to be promoted to be sisters. This is especially important now that sisters' salaries are to be raised, and appointments should not be decided by the matron alone. The meetings would help the matron, and ease her administrative worries. Voluntary reports collected from hospital workers by their trade-union inveigh heavily against the "all powerful" dominion of the superintendent and matron. Actually their autocracy varies a great deal and there are plenty of good ones; but it would be well to remember the saying that "all power corrupts, absolute power corrupts absolutely."

THE SOCIAL SIDE

The nurses are reaping the benefits of the facilities for reabling now provided in most hospitals. They have concerts, musical evenings, plays, and play-readings, and a good number of dances. The nursing charter promises them many more things; but Cicero looks over my shoulder and reminds me that "a favour slow in being conferred causes ingratitude." The main cities need centres where the nurses can gather, entertain their friends for tea, and stay for the night or the week-end. The homes of many of the girls are far from their hospitals, and a complete change from hospital atmosphere is good for all. At these centres, too, there could be museums and exhibits of the latest ideas. Theatre tickets could be supplied and visits to art galleries, cathedrals, and other places of interest arranged from these centres. The plan would broaden their outlook and add many joys to their lives. Rest-homes near the sea are much needed, especially for the more elderly sisters.

LITTLE THINGS

"Life is a bundle of little things," said the *Poet at the Breakfast Table*, and some of these can be annoying. Nurses working in the outer hospitals have been promised extra transport facilities; but it is often expensive for them to come up to London. Like the Service man they have to live away from home and should be allowed Service fares. They dislike their present uniforms: these are not well cut, and matrons are hardly the people to design them. Some of the assistant nurses have a uniform which looks like a maternity gown. Young girls like to show their figures, and surely we are past thinking that is wrong. In more recent times they have had to lose their aprons; they want them back, for nothing freshens them more before a meal, after having nursed a heavy case, than a change of apron. Lastly, they feel that the dances are their own affairs, and the eye of authority watching them closely as they mince around is disturbing. Matrons are welcome, but need not sit, in uniform, on the rostrum.

Doctors seldom write or concern themselves overmuch with the details of the nursing problems; it has been left to the editorial pen to stir up opinion for improvement. "Progress," wrote Herbert Spencer, "is not an accident." With a changed outlook we may expect to attract many girls, including some university graduates with a powerful contribution to make. When they find themselves welcomed as intelligent members of a team, sympathetically helped over their toddling days, and given time for the joys of personal nursing they will be on fire with ambition. There will be no need for daily advertisements. They will say to themselves that doctors and sisters "are what they are; they wear no masks for me."

Our brains are stored with second-hand thoughts. This thought was set a-galloping by a short talk, on some advances in psychiatric methods of nursing, by Dr. Maxwell Jones.

"... Before this year ends, the schools of medicine in this country will have graduated some 25,000 physicians whose school training has been compressed into three years of 12 months each instead of the usual four years of 9 months each. About 20,000 of these men, enrolled for military service, received an additional 600 hours of training in military affairs—a burden added to the full medical curriculum—and were subjected to the restrictions of partially regimented living. I have calculated that these figures mean that, as of the present and as of years to come, at least 30 per cent. of our physicians who are under 45 years of age, i.e., the most energetic fraction of the profession and that to which we look for the urge which drives medicine forward, are men whose training has perforce resulted in greater superficiality in learning, less tenacity of retention of what was learned, and a minimum of that contemplation and discussion from which spring habits of independent thought. ... The system of accelerated medical education which was forced upon us and which was not adopted by any other of the countries at war seems to me to have had an impact which may prove to have been calamitous. Its effect may perhaps be partially neutralised if the damage is recognised and if we force ourselves to construct and organise facilities for advanced training not only for the near, but also for the long, future."—A. N. RICHARDS, vice president of the University of Pennsylvania. *Science*, May 10, 1946, p. 575.

ACCIDENTAL LABORATORY INFEC WITH TSUTSUGAMUSHI RICKE

M. VAN DEN ENDE *
M.B. Cape Town
MEMBER OF SCIENTIFIC STAFF OF NATIONAL INSTITUTE FOR MEDICAL RESEARCH

S. LOCKET
M.R.C.P.
ASSISTANT PHYSICIAN, HOSPITAL, PEMBURY,

W. H. HARGREAVES
O.B.E., M.R.C.P.
LIEUT.-COLONEL R.A.M.C.

J. NIVEN
M.D. Glasg.
MAJOR R.A.M.C.

L. LENNHOFF, M.B.
SENIOR MEDICAL OFFICER, INFECTIOUS DISEASES HC
BRIGHTON

FOR the large-scale production of scrub-typhus from cotton-rats (Fulton and Joyner 1945, Bu al. 1945) the intranasal route of inoculation was extensively. The risk to the laboratory personnel this technique has been shown by accidental in laboratories working with murine typhus Ende et al. 1943). This risk, which depends largely on the dissemination of droplets from the tory tract of the animals during and for an hour inoculation, can be prevented by the use of inoculation cabinets (van den Ende and Hubbard

The laboratories constructed for the large-scale p tion of scrub-typhus vaccine were equipped with cabinets for the inoculation of animals and for all manipulations of infective material from which d dissemination could be anticipated. As a further guard, lactic acid aerosols (Lovelock et al. 1944) provided in *all* rooms where even the *slightest* r accidental contamination of the air existed. In add all members of the staff wore gowns, rubber gloves, respirators, and eyeshields, when these were appro for the particular work being done.

In spite of the elaborate precautions and the instructions given to every member of the staff, m whom were conspicuously conscientious throug four cases of accidental laboratory infection one of them during the preliminary work at the Na Institute for Medical Research, and the others large-scale vaccine production. In two of the infection followed accidents which were not fo in the third the source of infection has not been estab with certainty, but in retrospect an inhalation seems most likely. The fourth case was due to acci infection from *contaminated laboratory glassware* could have been prevented. The cases are of furth in that they occurred in persons who had received courses of immunising injections of Fulton and J (1945) vaccine, and all four made complete recoveries. salient features are summarised in the accompanying

CASE 1.—A woman, aged 42, who had previously laboratory infection with murine typhus (OX19 in D 1943), accidentally received what was probably an en inoculum on Feb. 16, 1945. She was bitten on her left by a cotton-rat, which came round from its an unexpectedly, after intranasal inoculation with a of scrub-typhus rickettsiæ. The cotton-rat hung on or two minutes before she could shake it off. She wound bleed freely and soaked her hand in strong solution for some five minutes.

Before this she had received four inoculations of 1 of scrub-typhus vaccine. These had been given on 14, and 28, 1944, and Jan. 5, 1945. A fifth dose of 1 was given on Feb. 27, eleven days after the accident.

Fourteen days after the rat-bite she developed a generalised headache and had several rigors, her temp rising to 103° F. The site of the last vaccine ino in the left upper arm became tender and swollen. N the scar of the rat-bite on her left thumb became painful, and she had pain and tenderness in the left axilla. She was then admitted to hospital.

---

* Seconded to the Wellcome Foundation by the Medical Council.

She was rather flushed, temperature 99·8° F and pulse-rate 84 per min. On the left thumb there was a small, injected, and slightly raised scar. There were local induration and tenderness at the site of the recent inoculation in the left upper arm, and a few small tender glands were palpable in the left axilla. Routine examination showed nothing else abnormal. The urine was normal on routine and microscopical examination. The leucocyte count was 6000 per c.mm., with a normal differential count.

For twelve days there were frequent rigors, sometimes accompanied by mild delirium. Headache was persistent. On the third day patient developed a dry cough, with moist sounds at both bases. She became critically ill on the sixth day, with a faint heliotrope cyanosis and a typical mild typhus rash consisting of subcuticular mottling, faint macules, and petechiæ on the limbs and trunk. This began to fade after two days and disappeared on the tenth day. Except in the left axilla, there was no glandular enlargement, and the spleen was never palpable.

On the seventh day of the fever *Proteus* OXK was agglutinated by her serum in a dilution of 1/160. On the thirteenth day the titre had risen to 1/50,000.

The treatment was symptomatic, abundant fluids with glucose being given throughout. Patient was well aware of the nature of her illness from its onset and coöperated excellently.

After the fourteenth day she was apyrexial, and her general condition improved dramatically. The headache disappeared, and after four days she was well enought to sit up in a chair. Two weeks later she left hospital, and after five weeks' convalescence she was perfectly well.

CASE 2.—A man, aged 28, a highly skilled technician who had previously had a laboratory infection of murine typhus in 1942, became ill with severe headache and malaise on June 6, 1945. He was concerned with the preparation of " seed " suspensions of scrub-typhus rickettsiæ from mouse lungs. These suspensions, which contained large numbers of virulent rickettsiæ, were being prepared for the inoculation of cotton-rats for the production of vaccine. His daily routine included the transfer of all suspensions, immediately after preparation, from centrifuge tubes to special ampoules, in which they were frozen and stored. Samples from each suspension were also plated on blood agar. For all the transfers of the material pasteur pipettes were used. A respirator and eyeshield were not worn.

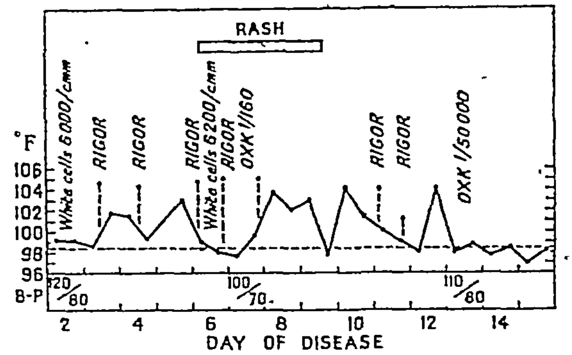


Chart of case 1.

It has been established since the onset of his illness that during such transfer bubbling is almost unavoidable. The breaking of such bubbles, especially in an open petri dish, causes a splash of droplets, often over a distance of several inches. It is highly probable that the infection resulted from the inhalation of such droplets. Patient had received five doses of 1 c.cm. of scrub-typhus vaccine on Jan. 11, 18, and 25, April 6, and June 2. He was admitted to hospital on June 9.

On admission he complained of severe headache, particularly over his eyeballs, but his general condition was very good. Examination showed a faint rosy macular rash on the trunk, slight conjunctivitis, and a faintly coated tongue. His heart, lungs, and abdomen appeared normal.

As his illness progressed the rash became more marked, particularly on the palms, and the conjunctival infection persisted. His temperature was intermittent, with numerous rigors. Six days after admission he complained of tightness in his chest, but nothing could be found on clinical examination. Delirium was slight, with some disorientation.

His blood-urea level, which was 30 mg. per 100 c.cm. on the third day after admission, rose to 60 mg. per 100 c.cm. on the tenth, and then began to fall. His blood-pressure, which was 120/80 on the third day, fell to 95/60 on the eighth day and then rose to normal levels. The rash disappeared on the eighth day after his admission.

Agglutinins for *Proteus* OXK were present in his serum to a titre of 1/160 during the first ten days of his illness; on the thirteenth day it had risen to 1/320, and on the sixteenth to 1/640.

SALIENT CLINICAL FEATURES

Clinical features	Case 1	Case 2	Case 3	Case 4
Age (yr.)	42	28	24	26
Sex	Female	Male	Female	Female
Duration from infection to onset of pyrexia	14 days	Unknown	11 days	? 17 days
Duration of pyrexia ..	14 days	16 days	15 days	? 23 days (definitely 19 days)
Rigors	Numerous	Numerous	At onset only	Nil
Day of onset of rash ..	6th	Unknown	5th	6th
Duration of rash (days) ..	4	More than 8	3	9
Severity of rash	Slight	Severe	Slight	Very severe
Delirium	Mild	Slight	Very slight	Severe
Chest signs and symptoms	3rd day : cough, râles, cyanosis	8th day : cough, no physical signs	6th day : cough, râles	6th day : cough, no physical signs
Onset symptoms	Headache, rigors, pyrexia	Headache, rigors, pyrexia, nasal catarrh	Headache, rigors, pyrexia, nasal catarrh, earache	Headache, pyrexia
Onset of local lesion from date of infection	15th day	None	10th day	Unknown
Adenitis	Local (left axilla)	..	Nil	Submental ; right axilla (severe)
Splenomegaly	Nil	..	Nil	Nil
White cells per c.mm. ..	2nd day 6000 6th day 6200	..	4th day 4200 11th day 5300	11th day 11,200
Maximal blood-urea level (mg. per 100 c.cm.)	..	60 on 13th day	35 on 3rd day	38 on 10th day
Minimal blood-pressure (mm. Hg)	100/70 on 7th day	95/60 on 11th day	90/55 on 10th day	95/60 on 14th day, on admission 90/60

CASE 3.—A woman, aged 24, was preparing for the intranasal inoculation of cotton-rats in an inoculation cabinet, when a graduated pasteur pipette, which had just been emptied of a highly virulent suspension of *R. orientalis*, accidentally broke. The broken end of the pipette pierced the rubber glove and injured the skin on the medial aspect of the left index finger.

A tourniquet of string was applied to the base of the finger within thirty seconds of the accident. The wound was excised immediately (within five minutes), free bleeding promoted, and an antiseptic applied. The wound healed almost completely with local application of sulphathiazole and dry dressings.

An injection of 1 c.cm. of scrub-typhus vaccine was given immediately after the accident, and on the same day 10 c.cm., in divided doses, of a phenolised serum from a rabbit convalescent from scrub-typhus. Next day she received intramuscularly 12 c.cm. of phenolised serum taken from case 2 during the third week of convalescence.

She fell ill with headache and rigors on the eleventh day after her accident and was admitted to hospital on July 25, 1945, the third day of her illness.

On admission she complained of severe headache, particularly over her eyeballs. She appeared seriously ill, with intense photophobia and conjunctival injection. Temperature 104° F and pulse-rate 84 per min.—a relative bradycardia for the temperature. Her chest was normal, and clinical examination of her heart showed nothing abnormal; blood-pressure 130/80. Abdomen normal; spleen not palpable; no lymph-gland enlargement. Tongue dry and slightly furred and breath foul. There was no visible rash, but there was a small papule about 1 cm. in diameter on the left index finger. This lesion was red and tender and involved the area which had been excised at the time of the accidental inoculation.

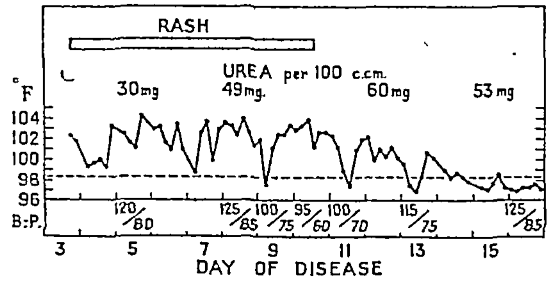


Chart of case 2.

The day after admission the urine contained a few pus cells and a light cloud of albumin. Blood-urea 39 mg. per 100 c.cm. and a blood-count showed Hb 72% (Haldane scale), with colour-index 0·76, white cells 4200 per c.mm., with a normal differential count.

The rash began to appear two days after admission (fifth day of illness) and consisted of faint pink macules 0·5–1·0 cm. in diameter, involving first the lower part of the trunk and later both arms and hands, including the palms, and both legs and shins. It was very faint and had entirely disappeared in three days. At the time of appearance of the rash her face was very suffused, eyes bloodshot, photophobia severe, tongue heavily coated, dry, dark brown, and very tremulous. Nausea, abdominal discomfort, and anorexia were pronounced, and she vomited twice. However, delirium was not severe and was present only at night. By day she was bright and cheerful and at times even euphoric. She coöperated well with the nursing staff throughout her illness.

Her blood-pressure fell steadily to 90/55 on the eighth day of admission and then began to rise. At no time was her blood-urea level above 35 mg. per 100 c.cm. On the day of admission the OXK agglutination test was positive at 1/40, next day (fourth day of illness) 1/160, and on Aug. 8, two days after her temperature had returned to normal, the titre had dropped to 1/80.

Treatment consisted of light diet and fluids by mouth ad lib. 'Pethidine' 100 mg. by injection was very effective in alleviating headache. She was discharged to a convalescent home five weeks after admission to hospital.

CASE 4.—A woman, aged 26, who, about three weeks before admission to hospital, washed some petri dishes which had contained scrub-typhus infected cotton-rat lungs and were therefore heavily contaminated with rickettsiæ. According to the rules of the laboratory these should not have been touched by hand until they had been autoclaved. She realised her error but did not report the accident. The exact which this happened is unknown but was, according to account, about seventeen days before the onset of malaise which marked the beginning of her illness. She admitted to hospital on Nov. 3, 1945, the fourth day illness.

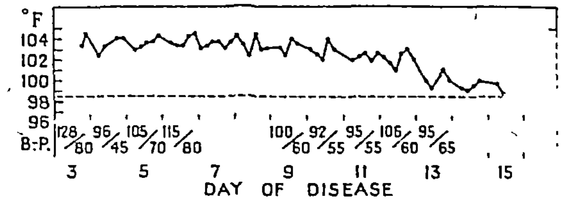


Chart of case 3.

On admission she was very ill, drowsy, and dis
There was no rash and no splenic enlargement. Heart lungs were normal. There was a small soft abrasion lower lip, which she had had for some time, but on the m finger of her right hand there was a recent small raised lesion about 1 cm. in diameter. Later there was a tender mass of glands in the right axilla, and it is certain that the site of infection was an abrasion at the of the finger-nail. Her blood-pressure on admission was

Her condition steadily deteriorated, though her b pressure rose after admission and did not fall again after the first week of her stay in hospital.

The rash appeared on Nov. 5 (sixth day of illness) consisted of deep subcuticular mottling, with maculæ petechiæ. As her mental and physical conditions deteriorating, and she was unable to take fluid by m a slow intravenous glucose saline was started on No In the next forty-eight hours she was given 90 oz. of gl saline and 20 oz. of plasma intravenously.

Her temperature was 101° F on admission, reached 1 on Nov. 7, and stayed at this level until the 15th, was intermittent until the 22nd, after which it remained no Her pulse-rate, which appeared to be a more accurate ind of her general condition, was maximal at 130 per min. o 14th and 15th and then fell steadily, reaching 80 on 22nd. A dry unproductive cough began on the sixth the illness (Nov. 5), when her respiration-rate rose to 30 min., but no physical signs could be found in the chest.

On the seventh and tenth days of illness her serum titre was nil; but it rose to 1/1280 on the twenty day and 1/3000 on the twenty-fourth.

During the early part of her illness her urine con a fair amount of albumin and a trace of blood, but this disappeared by the eighteenth day. She made a com recovery.

The diagnosis was in all cases established by Weil-Felix test—*Proteus* OXK agglutinin appearing a titre of 1/160 or higher during the illness. In t cases the test was repeated at short intervals. In on these the diagnostic serological response developed on fourth day, but in the others it was delayed beyond tenth day. In the case showing the early response maximal recorded titre was only 1/160, but the dia was confirmed by the isolation of the causal rickettsi

In cases 3 and 4 the isolation of *R. orientalis* attempted. In case 3, on the second day of her ill fresh venous blood was injected intraperitoneally 3 guineapigs (1–5 c.cm.) and 6 mice (0·1–0·5 c at the bedside. About 1 c.cm. of blood was also allo to clot. Half an hour later the whole clot was up in normal horse-serum broth and used in 0·1 c.cm. to inoculate 20 mice intranasally under ether-chlorof anæsthesia.

The guineapigs showed no pyrexial response, 1 of them which was killed on the fifteenth day showed peritoneal and pleural effusions, and ricke were demonstrable in smears of the spleen. The toneal fluid from this animal was injected peritoneally into 2 other guineapigs; 1 of t developed fever of 105·8° F on the eighth day. With next passage of the peritoneal fluid a fatal fe (105·8° F and 106·2° F) illness was produced in animals injected.

passage of brain, whole blood, or blood-clot of the guineapig to other animals did not result in the lishment of the strain.

mice that had received fresh blood intraperitoneally all severely ill on the twelfth day. They were from the twelfth to fourteenth day after inoculation. opsy all showed characteristic pleural and peri-al effusions, and rickettsiæ were demonstrable in rs of the spleens. It has been possible to maintain strain by serial passage of peritoneal fluid or spleen lsions. Deaths in later passages regularly occurred on tenth to fourteenth day after infection. An emulsion e brain of a mouse of the second passage was capable fecting further mice when injected intracerebrally.

illness following intracerebral inoculation was, ever, seldom fatal.

f the 20 mice inoculated intranasally, 6 died early n first to fourth day), and these deaths were regarded robably non-specific ; the remainder were ill by the to seventh day after inoculation. Mice killed on of the days from the fifth to seventh showed com-e or almost complete consolidation of the lungs, the presence of rickettsiæ in impression smears was btful. The consolidated lungs were emulsified in e-serum broth and used for inoculation of further e. The passages could thereafter be maintained in roken series. By the third passage mice were dying the fifth to sixth day with complete lung consolidation so many rickettsiæ in the smears that they could used for the preparation of seed suspensions in the ge-scale manufacture of vaccine.

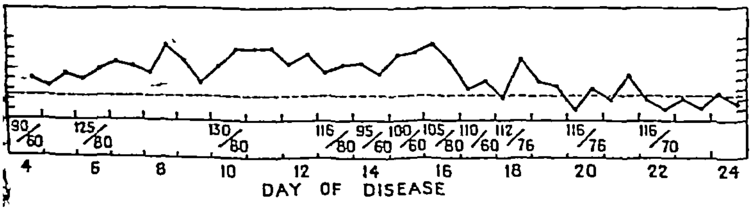


Chart of case 4.

R. *orientalis* was also isolated from the blood of case 4 the sixth day of her illness. Fresh whole blood cted intraperitoneally into guineapigs caused peri-itis in one of them, and *R. orientalis* could be demon-ted in smears. One of 6 mice which received whole od of the patient intraperitoneally was ill after eight ys. It was killed and necropsy showed the charac-istic peritoneal effusion of scrub-typhus infection, enomegaly, and rickettsiæ in spleen smears. Isolation mice inoculated by the intranasal route was not empted in this case.

Complement-fixation tests with formolised cotton-rat ng scrub-typhus vaccine as antigen (Henderson-Begg d Fulton 1946) were performed with serum samples of patients.

DISCUSSION

These cases of accidental laboratory infection are portant because they demonstrate where the pre-utions taken in the laboratory were inadequate. Two the accidents that led to infection were unforeseen—bite from an infected rat and an injury from a broken pette. It has been possible to avoid the repetition the former accident by adopting single wire-mesh ges, which were not initially available, to house the s. Into these the rats were placed immediately after culation and before recovery from the anæsthetic. e complete avoidance of accidental breakages of fected glassware has been impossible, but the care ded especially with the manipulation of fragile ettes should be emphasised repeatedly.

The infection of case 4 was avoidable, and in fact expo-re to infection in this case resulted from a breakdown of regulations. The subject, aware of her error, failed to notify the accident, so that prophylactic treatment could not be attempted.

Case 2 was probably infected by the inhalation of droplets disseminated by breaking of bubbles during pipetting. This danger, which should be obvious when highly infective material is handled, had not been sufficiently realised. It has since been possible to avoid repetition of the accident by instructing the workers to wear rubber gloves, dust respirators, and eye-shields.

All the patients had received full immunising courses of Fulton and Joyner's scrub-typhus vaccine. The vaccination has not afforded absolute protection. It is, however, likely that the infecting doses acquired in the laboratory were far larger than those encountered during natural infection from the mite. In fact, previously reported laboratory infections with *R. orientalis* have been fatal in 3 of 5 cases (unpublished observations). The vaccine may, therefore, have afforded a significant degree of protection.

The isolation of the causal rickettsiæ by three different methods from case 3 is of interest particularly because of the case with which the ætiological agent was recovered in the lungs of mice after intranasal inoculation. This may have been because the infection was acquired from rickettsiæ adapted to mouse lung by repeated passage or simply because of the large numbers which were present in the circulating blood of the patient. The isolation of *R. prowazeki* from the blood of patients suffering from classical or murine typhus after previous immunisation with purified vaccines has been shown to be difficult. The ease of isolation in cases 3 and 4 may therefore indicate relatively ineffective immunisation. It may, on the other hand, indicate that the blood-stream infection is greater in scrub-typhus than in classical typhus, or simply that the guinea-pig and mouse are more susceptible to infection with *R. orientalis* than with *R. prowazeki*.

SUMMARY

Four cases of accidental laboratory infection with scrub-typhus are reported. Their occurrence in relation to precautionary measures taken in the laboratory is discussed.

From two cases the causal rickettsia was isolated in mice and guineapigs by intraperitoneal inoculation. In one of them isolation succeeded also in mice which received ground blood-clot intranasally.

The diagnosis could be established by *Proteus* OXK agglutination tests and complement fixation with formolised scrub-typhus antigen.

All the patients had previously received immunising injections of scrub-typhus vaccine prepared from cotton-rats. Their complete recovery suggests that the vaccine had some protective value.

We wish to thank Major A. Henderson-Begg for his help especially for performing the complement-fixation test; Major-General A. G. Biggam, C.B. ; Major-General L. T. Poole, C.B. ; Dr. F. Fulton and Captain A. Dudgeon for their assistance ; Dr. E. R. Jones, of the Kent county laboratory, Maidstone, for OXK agglutination tests in cases 3 and 4; Dr. W. M. Ramsden and Dr. S. J. Firth, for permission to include two of the cases, and the staffs of the various hospitals, whose interest and attention ensured the speedy recovery of the patients.

REFERENCES

Buckland, F. E., Dudgeon, A., Edward, D. G. ff., Henderson-Begg, A., MacCallum, F. O., Niven, J. S. F., Rowlands, I. W., van den Ende, M., Bargmann, H. E., Curtis, E. E., Shepherd, M. A. (1945) *Lancet*, ii, 734.
Fulton, F., Joyner, L. (1945) *Ibid*, p. 729.
Henderson-Begg, A., Fulton, F. (1946) *J. Path. Bact*. (In the press).
Lovelock, J. E., Lidwell, O. M., Raymond, W. F. (1944) *Nature, Lond.* 153, 20, 743.
van den Ende, M., Hubbard, A. J. G. (1943) *J. Hyg., Camb.* 43, 180.
— Stuart-Harris, C. H., Harries, E. H. R., Steigman, A. J., Cruickshank, R. (1943) *Lancet*, i, 328.

THE CONTROL OF POLIOMYELITIS

JAMES DEENY
M.D. Belf., F.R.C.P.I.

JOHN D. MACCORMACK
M.C., M.Sc. N.U.I., L.R.C.P.I.

From the Department of Local Government and Public Health, Dublin

RECENT attempts to determine the mode of transmission of poliomyelitis have yielded results which suggest the possibility of limiting outbreaks of the disease by the application of preventive measures. Such a possibility is particularly welcome to public-health authorities, who have hitherto been helpless in combating the disease.

The studies of Pearson and Rendtorff (1945a and b), Pearson et al. (1945), Paul et al. (1940), and other investigators have shown that the virus responsible for poliomyelitis can be recovered from the stools of patients in the infective stage, from abortive cases, and from healthy contacts. Kling et al. (1939) found the virus in drinking-water, and there is evidence that the disease can be transmitted by infected food. Sabin and Ward (1942), Paul and Trask (1941), and Toomey et al. (1941) have definitely incriminated the house-fly as a further means of spread. Howard and Clark (1912), summarising experiments on the transmission of poliomyelitis by insects, excluded mosquitoes and lice but stated that bed-bugs took up the virus from the blood of infected monkeys and maintained it in a living state for seven days. The house-fly (*Musca domestica*) carried the virus in an active state for several days on the body surface and for several hours in the intestinal tract. Bang and Glaser (1943) have found, however, that the virus tends to disappear from the bodies of flies rather than to multiply.

As a result of the study of these findings an experimental scheme for the epidemiological control of poliomyelitis was devised. Briefly the procedure consisted of:

1. Immediate isolation of cases in hospital, with thorough disinfection of their homes, &c.
2. Quarantine of family contacts for a week, and partial quarantine for two weeks thereafter.
3. Information to doctors and the public in the area affected, so that all cases of pyrexial illness might be seen at once.
4. Exclusion, from schools and other public places, of the children from the area.
5. Propaganda by radio, press, and leaflets, with follow-up by public-health personnel, advising (*a*) care in the handling of food, especially in its protection from fly contamination, (*b*) the boiling of milk, and (*c*) frequent careful washing of the hands in running water, especially after visiting the lavatory and particularly by those handling and preparing food.
6. In districts where a piped water-supply is not available, water used for all domestic purposes to be boiled.
7. Treatment of fæces with disinfectants. (In rural districts fæces to be covered with fresh earth to prevent access by flies.)
8. Destruction of flies in the area with D.D.T.
9. Notification of all cases by wire or telephone, and progress reports to the Department of Local Government and Public Health, Dublin.

The occurrence of a small outbreak of the disease in county Dublin, with an extension to county Clare, presented an opportunity of testing the application of this technique.

COUNTY DUBLIN AREA NO. 1

The outbreak began on Sept. 15, 1945, when five cases were notified from a residential area in the Dublin suburbs. The cases all showed definite symptoms of acute poliomyelitis, with onset in the same week—i.e., Sept. 15–22. The patients all lived within a short distance of one another but had no other contact. Preliminary investigations revealed a common milk-supply to the homes of the five patients, but the apparent significance of this fact was largely discounted because the dairy concerned supplied 80% of the houses in the Four of the patients were males, aged 15 years, 32 (died), 16 years, and 30 years, and one was a girl 4 years. The area is sharply defined and is abo square miles in extent. The measures previousl lined in the experimental scheme of control were

The method of employing D.D.T. was as follows: preparation was used in a kerosene solution. Pa attention was paid to the five houses affected, were treated thoroughly inside with a 2% sol The gardens and grounds were also carefully sprayed a 5% solution. Every house in the area was with D.D.T. spray in a somewhat less elaborate than in houses in which cases had occurred, but compost heap, manure heap, or refuse dump, flies could breed, was sprayed. Some ponds were treated with the oily solution. Special attentic given to dairy premises, where a 5% solution was throughout buildings and on manure heaps. bellies of cows were sprayed, as they are a fa feeding-ground of stomoxys.

Specimens of dead flies were collected from selected houses after the D.D.T. spraying. Only the common varieties of house-fly were found: *M. domestica* and *Fannia canicularis*. In one house a beetle was recovered with the dead flies from a kit showing a direct connexion with a garden manure Since facilities for virus examination were not av search for a positive source of infection was not out.

COUNTY CLARE

ON Sept. 15, 1945, notification of a case of pol was received by wire from the county medical o of county Clare. The patient was a domestic aged 20, who worked in a house close to the ho the other cases in county Dublin area no. 1. She had to Clare, almost 200 miles away, on holiday and actually incubating the disease during her jo The first signs of illness had developed on Aug. 29, she was not seen by a doctor until Sept. 12, when had become evident. This case was followed by others, two (females, aged 32 and 11 years) being in same rural district, and two outside the district (1 aged 7½ years, and 1 female, aged 7 years). No d connexion was established between any of the five c

Dr. G. P. McCarthy, county medical officer of Clare, applied, in the districts concerned, measures similar to those instituted in county Dublin no. 1. The areas being rural, additional precautions advised, including the boiling of all water before domestic use, and the disinfection and covering earth of all excreta. The disinfectants used chloride of lime or coal-tar derivatives.

COUNTY DUBLIN AREA NO. 2

On Sept. 22, 1945, notification was received of a poliomyelitis in a boy, aged 2 years, a patient in Irish Red-Cross tuberculosis preventorium. The had been in the institution for over five weeks, except for a visit from two aunts from England about days before the development of his symptoms, had no outside contacts. Similar preventive measures adopted. These included thorough treatment of institution with D.D.T. spray and of the surroun farmhouses and of manure heaps within a radius of a mile. The nurses were warned to take preca against the possible spread of the disease by d infection, including contamination of the hands guarding coughs and sneezes.

COUNTY DUBLIN AREA NO. 3

On Sept. 29, 1945, a case was notified from a thic populated residential area. Precautionary m were immediately applied in each house on the road which the case had occurred and throughout the adj district ($^3/_4$ mile square). This included, in close mity, a boarding-school for young boys, which been affected in a previous epidemic of poliomyelitis 1942–43. Special instructions, similar to those in the st case, were given to the headmaster of this school.

COUNTY DUBLIN AREA NO. 4

On Oct. 19, 1945, a case was notified from a large lic boarding-school situated in the Dublin mountains the same rural district as the preventorium (case 3). he patient, a boy aged $15^1/_2$ years, had not left the school r some weeks and was not in contact with any known se. He was isolated at once and the control scheme plied, with the following additional provisions :

All table and cooking utensils were immersed in heavily chlorinated water before being put through the washing machine.

Drinking-water, which came from a private reservoir, was chlorinated.

All nose, throat, and dental operations were postponed.

All visits to boys were forbidden for three weeks.

Any additional strain from games or farm work (a feature of the school) was avoided in the case of the less robust boys. Further instructions were given to the teachers, who lived outside the school, to enable them to avoid carrying infection either to their homes or into the school. Their homes were visited and sprayed with D.D.T.

Leaflet instruction, which included information on prevention of droplet infection, was also given to the boys.

In addition, the area within a mile of the school was isited by D.D.T. squads, and houses, privies, and manure eaps were sprayed. Leaflet instruction was also given o householders in this area.

COMMENT

Poliomyelitis is so universally dreaded that the public will submit to any scheme, no matter how troublesome, f they think that it will afford protection. In our xperience the public-health personnel were made welcome, and the utmost coöperation was afforded everywhere. As it was impossible to carry out a control xperiment, and in view of the epidemiological nature of the disease, the results, though encouraging, are not regarded as any proof of the success of the method. The technique which we have outlined and the account of its application are published as evidence of the practicability of such a measure, but no claim is being made regarding its efficacy. The reassuring effect of the measures on the community established their psychological worth. It is hoped that other trials of this procedure, preferably with variations, will be carried out under differing conditions.

The scheme was made possible because of a plentiful supply of D.D.T. This had been manufactured in Ireland for the Department of Local Government and Public Health and had been available for public-health purposes for many months. The health department of the Dublin Corporation coöperated by furnishing the squads of trained D.D.T. operators for work in county Dublin. This test was carried out by the Department of Local Government and Public Health (field work being supervised by J. D. M.), since the central health authority could mploy a wider approach than that possible for a smaller public-health unit.

Since the experiment was finished a circular has been sent to each city and county medical officer in Eire oncerning the technique, and approval has been given or the free provision of a D.D.T. service and disinfectants, uch as chloride of lime, potassium permanganate, &c., or use on excrement Sanitary squads in Irish cities nd in many counties are already trained in D.D.T. echnique as part of their routine public-health work. ersonnel not already trained are being given courses.

The detailed study by Pearson et al. (1945), of the niversity of Michigan, on outbreaks of sporadic cases in farms, villages, and small towns, and on an epidemic in a large town, has shown that the virus has been isolated most frequently from the fæces of persons who were close family contacts with a known paralytic case ; less frequently from those with more remote contact ; and very seldom among those who had no connexion with such a case. They were convinced that infection was from case to case, whether clinical or sub-clinical, and that the control of the disease depended on early diagnosis and the management of contacts. These findings, with the added possibility of fly-borne and other modes of infection, show clearly that control measures must not overlook any possible means of spread (*Lancet* 1945). It is suggested that the procedure at present applicable throughout Eire attempts to cover practically every means of transmission now known.

SUMMARY

An experimental procedure devised for the control of poliomyelitis has been applied during a small epidemic.

The results, though encouraging, do not establish any claim for the efficacy of the procedure.

We wish to thank Dr. F. C. Ward, parliamentary secretary to the Minister for Local Government and Public Health, for permission to publish this paper ; Dr. G. P. McCarthy, county medical officer of health, county Clare, Commissioner D. J. O'Donovan, of the Dublin county council, and Dr. J. A. Harbison, medical officer of county Dublin, for their help ; Dr. P. J. Hernon, city manager, Dublin, Dr. M. J. Russell, city medical officer, Dublin, and the sanitary squads of Dublin Corporation Health Department, for their coöperation ; and Dr. B. P. Beirne, of the department of zoology, Dublin University, for entomological advice and assistance.

REFERENCES

Bang, F. B., Glaser, R. W. (1943) *Amer. J. Hyg.* **37**, 320.
Howard, R. A., Clark, B. (1912) *J. exp. Med.* **16**, 850.
Kling, C. (1939) *Int. Bull. econ. med. Res.* A **40**, 161.
— Olin, G., Magnusson, J. H., Gard, S. (1939) *Bull. Acad. Méd. Paris*, **121**, 826.
Lancet (1945) ii, 278.
Paul, J. R., Trask, J. D. (1941) *J. exp. Med.* **73**, 453.
— — Gard, S. (1940) *Ibid*, **71**, 765.
Pearson, H. E., Rendtorff, R. C. (1945a) *Amer. J. Hyg.* **41**, 164.
— — (1945b) *Ibid*, p. 179.
— — Brown, A. B. (1945) *Ibid*, **41**, 188.
Sabin, A. B., Ward, R. (1942) *Science*, **94**, 590 ; **95**, 300.
Toomey, J. A., Takacs, W. S., Tischer, L. A. (1941) *Proc. Soc. exp. Biol., N.Y.* **48**, 637.

PIN AND GRAFT ARTHRODESIS FOR OSTEO-ARTHRITIS OF THE HIP *

JAMES PATRICK
M.B. Edin., F.R.C.S.
ORTHOPÆDIC SURGEON, GLASGOW ROYAL INFIRMARY

SUBTROCHANTERIC osteotomy, arthroplasty, and arthrodesis are the three popular surgical procedures in the treatment of osteo-arthritis of the hip.

McMurray's subtrochanteric osteotomy has the advantage of simplicity and is associated with little shock, and for elderly people it has been regarded as the treatment of choice. It has, however, the disadvantages which are associated with the wearing of a long plaster spica, not the least of which is knee stiffness, which often ensues in old people. Also, though the pain in the hip can often be relieved, such relief is commonly only temporary, and within a year or two pain may recur.

Bony arthrodesis of the hip is the one treatment certain to cure the hip pain permanently, but owing to the severity of the operation one hesitates to perform it in anyone aged over 60. Simple fixation of the hip with a large Smith-Petersen nail is sometimes done in these elderly people, but even with an inert metal the adjacent bone is absorbed owing to the physical pressure exerted by the nail, and soon hip movement and pain recur.

---

* Based on a clinical lecture to Glasgow Medico-Chirurgical Society on Oct. 26, 1945.

After experience gained in the use of a fibular graft combined with a Smith-Petersen nail in intracapsular fracture of the neck of the femur, it occurred to me that a similar technique might be applied to produce an arthrodesis of the hip in old people. Such an operation—namely, fixation of the hip with a Smith-Petersen nail and fibular graft alone—has now been done in 25 cases of osteo-arthritis of the hip during the last four years. All the patients had advanced osteo-arthritis of one hip, and in some a McMurray's osteotomy had previously been done, with temporary alleviation of the pain. All the patients were regarded as unsuitable for open arthrodesis, and their ages ranged from 51 to 84.

Work on similar lines has been carried on simultaneously by Harris,[1] of Toronto, who published a description of a similar technique of arthrodesis of the hip in 1943. Harris, however, used twin tibial grafts side by side placed above the nail.

TECHNIQUE OF OPERATION

To begin with, errors in technique and in after-treatment were made, but the following procedure has now been adopted.

The patient's skin is prepared from the waist to the foot on the affected side. A spinal anæsthetic of 'Nupercaine' 3 c.cm. is given, and the patient is then placed on an orthopædic table with the legs bound to the foot-pieces. The hip deformity is corrected so far as possible, external rotation being the one deformity which nearly always remains. A halfpenny is held against the trochanter during the preliminary radiography. The 1-in. diameter of the halfpenny is seen magnified on the anteroposterior radiogram; therefore a corresponding magnification of the bone shadows can be allowed for. An assistant calculates how far from the vastus lateralis ridge at the base of the greater trochanter the preliminary hole in the centre of the femur has to be made. A guide wire is then inserted; and, when it is correctly placed low in the neck of the femur, a stainless-steel Smith-Petersen arthrodesis nail of appropriate length is inserted. The ideal position of the nail is where it just penetrates through the inner table of the pelvis. Owing to the impossibility of internally rotating the femur in most cases one has generally little choice but to do this.

While radiograms are being taken and developed the fibular graft is cut. It should be taken from the lower half of the shaft to avoid excessive bleeding. If directly with bone shears the fibula generally so the shaft should be weakened beforehand by three holes fanwise at either line of section. The should be about as long as the nail—usually 6 in.

With the nail in place, a guide wire is placed in hollow axis to act as a guide for the drill which i make the tunnel for the graft. Three diamet twist drill, $^1/_2$ in., $^7/_{16}$ in., and $^3/_8$ in., are needed to co spond to the possible variations in size of the fib Each drill is 9 in. long, so that the handle of the b is not blocked by the thigh as the instrument is rota A collar on the drill is fixed to mark the desired de of penetration, which should correspond exactly to length of the nail. The drill is inserted above the exactly parallel to the guide wire until the collar on drill is at the level of the head of the nail. In w drawing the drill it should still be rotated in a clock fashion so that no bone drillings are left behind.

The crucial part of the operation is the inser of the fibular graft intact along this tunnel. As bone near the osteo-arthritic hip is exceedingly dens slight misfit will lead to shattering of the graft, an bony fusion will not be obtained.

Before the graft is inserted, the ridges on the fi are removed with a sharp gouge and hammer until whole graft can be just passed through a hole in a ga consisting of a piece of 'Perspex' or metal $^3/_{16}$ in. t in which three holes are drilled corresponding to three sizes of drill used.

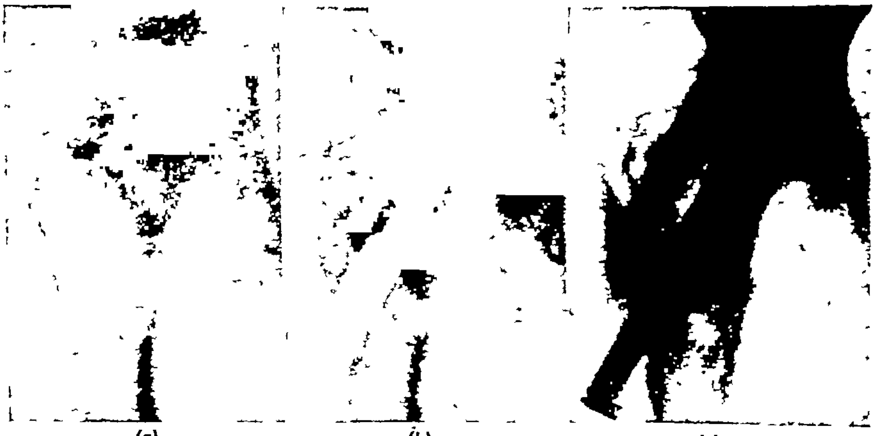
Once an accurate fit of the graft is assured, it be tapped along the tunnel, the guide wire still b retained in place to indicate the line of insertion. desirable to insert a cross-pin to prevent extru of the nail. The wound is then closed and the pat returned to bed.

Two or three days after the operation a short s plaster is applied and knee movements are begun. patient is allowed up on crutches on the fifth day. plaster and crutches are retained for three months, thereafter weight-bearing is allowed. By this time movement of the hip is possible and pain is abs though it takes about a year for the patient to recove his former activity and strength. The gratitude pensioner who has thus been relieved of his pain ha be seen to be believed.

Even with a short plaster spica flexion of the beyond a right angle is difficult, but the full ra of knee movement soon ret if the first 90° of movemen kept up from the start.

In some of the early c certain errors were made. Ow to the density of the head guide wire may bend as i inserted. Undue force sho not be used in placing the w and it should be withdr once the nail has been drive about 2 in. The accurate fit of the graft is undoubtedly critical part of the operat In some cases where a ga was not used the graft shatter and, though the broken fr ments of graft were pus across the joint, bony fusion not take place, and some de of movement and pain develop

During the first few weeks t nail holds the hip firmly; me time the graft is relatively lo As the nail loosens its g the graft becomes firm


(a) (b) (c)

Osteo-arthritis of hip, with old deformed head of femur, in a woman aged 64: (a) before operation; (b) 3 months after insertion of Smith-Petersen nail and fibular graft; note absorption of bone round nail in contrast with graft, which shows no such reaction; nail penetrates inner cortex of pelvis, but this is demonstrable only in an oblique view; (c) 3 years after operation; note persistent absorption of bone round nail and some extrusion of nail; graft is now an integral part of local bony structure; though complete bony fusion of hip appears to have taken place, bony arthrodesis is probably confined to upper part of hip near graft.

---

[1] Harris, R. J. *Surg. Clin. N. Amer.* 1943, 23, 1412.

akes over the function originally assigned to the nail. During this period of transference of responsibility from the nail to the graft there is a danger of too much mobility of the hip developing, and for this reason a short spica plaster is desirable. In one case treated without a spica there was no fusion.

A fibular graft is preferable to a tibial graft, for the former is easily rounded to a cylindrical shape; and, as it contains all the elements of bone and has not the dense cortical structure of the tibia, it makes and behaves as an ideal graft. In old people regeneration in the gap left in the fibula does not occur, but the loss of this part of the fibula seems to cause no weakness. Some œdema of the ankle lasts for a few months and is controlled with an elastic stocking.

CONTRA-INDICATIONS

These are similar to those for an ordinary open arthrodesis—namely, severe arthritis of both hips and severe lumbar arthritis. There is also a limit to the weight of the patient whose hip can be successfully fixed by a pin and fibular graft. A woman weighing 19 st. was treated in this way, but within six months the pin was loose, and the graft was broken and partly absorbed.

INDICATIONS

This operation is specially indicated for osteo-arthritis of the hip in any elderly patient. It can also be used in cases in which an unsuccessful open arthrodesis has been done, and in pinned fractures of the neck of the femur which have developed aseptic necrosis and painful arthritis.

RESULTS

In the past four years I have treated 25 cases of steo-arthritis of the hip by arthrodesis with a Smith-etersen pin and fibular graft. No attempt has been ade to assess the results on a percentage basis, for the rocedure was new and experimental, and technical rors were made in the early cases. Where the pro-edure described was followed out, however, all cases eveloped a solid fusion, except the above-mentioned atient who weighed 19 st. There was no mortality nd no infection in any of the cases.

SURVIVAL OF PENICILLIN-SENSITIVE ORGANISMS IN DRIED PENICILLIN

H. Proom
B.Sc. Lond.

From the Wellcome Physiological Research Laboratories, Beckenham, Kent

The sterility testing of penicillin has all the difficulties associated with the testing of a highly bacteriostatic substance. The Therapeutic Substances Act Regulations, 1944, do not give any directions in this matter but leave much to the discretion of the manufacturer. Since organisms exist which have all degrees of penicillin-sensitivity from completely susceptible to completely resistant it is advisable—in fact essential—to include in the medium used for these tests a penicillin-inactivating substance. Perhaps the most suitable is penicillinase, more particularly since strains of *B. subtilis* have been isolated which regularly produce in broth-culture filtrates a high concentration of penicillinase, 1 ml. of filtrate inactivating upwards of 200,000 units of penicillin.

The production of penicillin in the dried form either as powder or tablets offers, as has previously been pointed out,[1] an additional problem, since it is possible that penicillin-sensitive pathogenic organisms may survive in contact with dry penicillin and may, when the drug is dissolved, survive for a short period in contact with the penicillin solution. The reduction of the concentration of penicillin after injection into the body, due to dilution and excretion, may reduce the concentration to a level which will enable the organisms to multiply. This note will describe some experiments designed to show whether dried sensitive organisms will survive in contact with commercial dried penicillin, and whether under any conditions this mixture when dissolved and injected parenterally can infect animals.

EFFECT OF INJECTING A SOLUTION OF A MIXTURE OF DRIED PENICILLIN AND CULTURE INTRAVENOUSLY INTO RABBITS

Rabbit	Rabbit injected intravenously with 1 ml. of—	Minutes between solution and injection	Day of death
1	One dried culture of type I pneumococcus CN 33 reconstituted in 50 ml. broth	20	2*
2, 3, 4	One tablet of penicillin containing 10,000 units ground with one dried culture CN 33 and dissolved in 50 ml. broth	1	6
5, 6	One tablet of penicillin containing 10,000 units ground with one dried culture CN 33, 1 ml. penicillinase added, and dissolved in 50 ml. broth	1	3
7	Ditto	1	7
8	One tablet of penicillin containing 10,000 units ground with one dried culture CN 33, dissolved in 2 ml. distilled water; 1 ml. added to 25 ml. broth	20	Survived
9	Remaining 1 ml. added to 25 ml. broth containing 1 ml. penicillinase	20	Survived

* Postmortem examination of all rabbits dying showed typical septicæmia due to type I pneumococcus.

Viability of Dried Pneumococcus Mixed with Dry Penicillin.—0·2 ml. amounts of a broth suspension of virulent penicillin-sensitive type I pneumococcus, strain CN 33, were distributed into small glass tubes and dried by the freeze-dry method. Four tablets of the calcium salt of penicillin, each tablet containing 10,000 units, were ground in a sterile mortar. The dried culture from two tubes was added and the mixtures further ground and distributed into six small sterile glass tubes plugged with cotton wool. The tubes were placed in a desiccator over P_2O_5 and stored at room temperature. Tubes were removed at intervals from the desiccator and the contents emulsified in 10 ml. of broth containing 1 ml. of penicillinase, sufficient to inactivate 64,000 units of penicillin, and incubated at 37° C overnight. Growth of pneumococcus occurred overnight up to a storage interval of ten weeks, the longest interval tested.

It is evident that dried pathogenic penicillin-sensitive organisms may remain viable for a considerable time in contact with dry penicillin.

Effect of Injecting a Solution of a Mixture of Dried Penicillin and Pneumococci Intravenously into Rabbits.—One tablet of the calcium salt of penicillin, containing 10,000 units, was ground in a sterile mortar with the contents of one tube of dried pneumococcus culture CN 33. The mixture was dissolved in 50 ml. of broth and 1 ml. of solution was injected intravenously into a rabbit. This dilution is such that 1 ml. contains approximately 200 units of penicillin, which, when injected into a 2 kg. rabbit, gives an initial concentration of penicillin of the same order as with the usual human therapeutic dose. The experiment was repeated several times, penicillinase being added in some cases to inactivate the penicillin. Attention was paid to the time interval between dissolving the mixture and injecting the dilution into a rabbit. The results are shown in the table.

It is apparent that in this particular instance the mixture of organisms and penicillin injected into a rabbit within as short a period as possible after solution will uniformly kill the rabbit; if, however, the penicillin and organisms are left standing for a short time the rabbit will survive.

---

[1] Proom, H. *Brit. J. exp. Path.* 1945, 26, 98.

DISCUSSION

These few experiments show that penicillin-sensitive organisms may survive in contact with commercial dried penicillin for a considerable time. Also that, under certain conditions, these mixtures when dissolved and injected into animals may cause a fatal infection. In this particular case when the solution had been allowed to stand for a short time the mixture was no longer infective, but other pathogenic species or strains more resistant to penicillin may remain viable for longer periods.

It is not suggested that the survival of organisms present in the material is a serious risk in the use of penicillin; experience has shown that this is not the case. However, to eliminate as far as possible all risk, it is advisable to use a sterility test which will indicate the presence of any viable penicillin-sensitive organisms in the dried penicillin. Also, it is clearly necessary for the clinician to use the same aseptic precautions for dried penicillin as for any other substance for parenteral injection.

SUMMARY

Dried pathogenic penicillin-sensitive organisms may remain viable for a considerable period—at least 10 weeks—in contact with commercial dried penicillin. This mixture when dissolved and injected into animals may cause infection.

In practice the risk of infection from contaminated dried penicillin is small, but it is sufficient to make it advisable to test the sterility of dried penicillin before use.

Reviews of Books

Topley and Wilson's Principles of Bacteriology and Immunity

(3rd ed.) Revised by G. S. WILSON, M.D., F.R.C.P., K.H.P., professor of bacteriology as applied to hygiene in the University of London at the London School of Hygiene and Tropical Medicine, director of the Public Health Laboratory Service; A. A. MILES, M.A., F.R.C.P., professor of bacteriology in the University of London at University College Hospital medical school. London: Edward Arnold. Pp. 2054. 2 vols. 60s.

"Topley and Wilson" (now happily back to the two volumes of the first edition) has become the standard work of reference for most laboratory workers and all interested in medical bacteriology and its application to the public health. Topley's assumption of the secretaryship of the Agricultural Research Council in 1941 and his death in 1944 placed on his colleague the task of bringing the book up to date; fortunately in Professor Miles, whose keenly critical mind and lively phraseology can be appreciated in the new edition, he found a worthy successor to Topley. Recent literature has been thoroughly combed, abstracted and digested, and presented to the reader in an assimilable form. Indeed, many of the chapters are concise monographs, whether the subject be the tubercle bacillus or the disease tuberculosis, the genus Shigella or bacillary dysentery, the bacteriology of milk or of water. Special mention may be made of the reviews on bacterial metabolism and bacterial variation, the new chapter on chemotherapy, the extension in our knowledge of anaerobes (a fuller discussion on the place of antitoxin in the prophylaxis and treatment of gas gangrene would have been welcome), new data on the salmonella family with a brief mention of the evidence incriminating dried egg for the introduction of fresh American types of salmonella to this country, the critical—perhaps over-critical—analysis of B.C.G. vaccination, and the chapter on the bacteriology of air and the control of respiratory infections. The authors must be admired for their industry and unfailing accuracy, for their critical analyses and sound judgment, for their courage and skill in tackling such topics as bacterial metabolism, disinfection, and statistical methods, and for devoting what spare time they had during the war to this task. It is pleasant, too, to be able to congratulate the publishers on the form and materials of the book.

Textbook of Ophthalmology

(3rd ed.) SANFORD GIFFORD, M.D., F.A.C.S., professo of ophthalmology, Northwestern University, Chicag London: W. B. Saunders. Pp. 457. 20s.

THE revision of this book, in which the essentia of ophthalmology are compressed into 400 pages, wa completed by the author just before his death; ha he lived, he would undoubtedly have added a chapte on penicillin in ophthalmology. In every other way th book is up to date. The many colour-photographs external eye conditions are an advance on anythin the artist's brush can produce, though for fundus illu trations colour-photography still leaves something to b desired. Professor Gifford was widely known for his san views on debated subjects, and the chapter on the trea ment and correction of myopia states outstandingly h common-sense opinions. Neither glasses nor exercise are curative of this condition, and it does no harm t say so in direct language. Because of its handy siz lucid text, and fine pictures, Professor Gifford's textboo must be considered one of the best students' manual on the eye ever written.

Selected Papers from the Royal Cancer Hospital an the Chester Beatty Research Institute

Vol. III. London. Pp. 345. 18s.

THE third volume of selected papers contains its ow warrant for collecting and reprinting these contribution to 16 different publications. Professor Kennaway' notes on the current literature of cancer research revea how widely the papers are scattered and with how muc irrelevant matter they are confused. Since his appea was first made for more system both in publishing an abstracting cancer literature no move appears to hav been made in this direction. Scattering is almos inevitable as the present volume shows. The subjec has ramifications into several basic and applied sciences The collection, classification, cataloguing, and abstractio of all that appears seems to be an obvious activity fo the swollen funds available for cancer research. In th meantime we have here in pleasant and convenien form some papers that are especially valuable for medi cal readers. The aims and methods of measurement o radiation for medical purposes are lucidly set forth b Professor Mayneord. Articles on treatment of specia sites and many papers on experimental research don in 1941–42 are included.

Everybody's Way to Health and Fitness

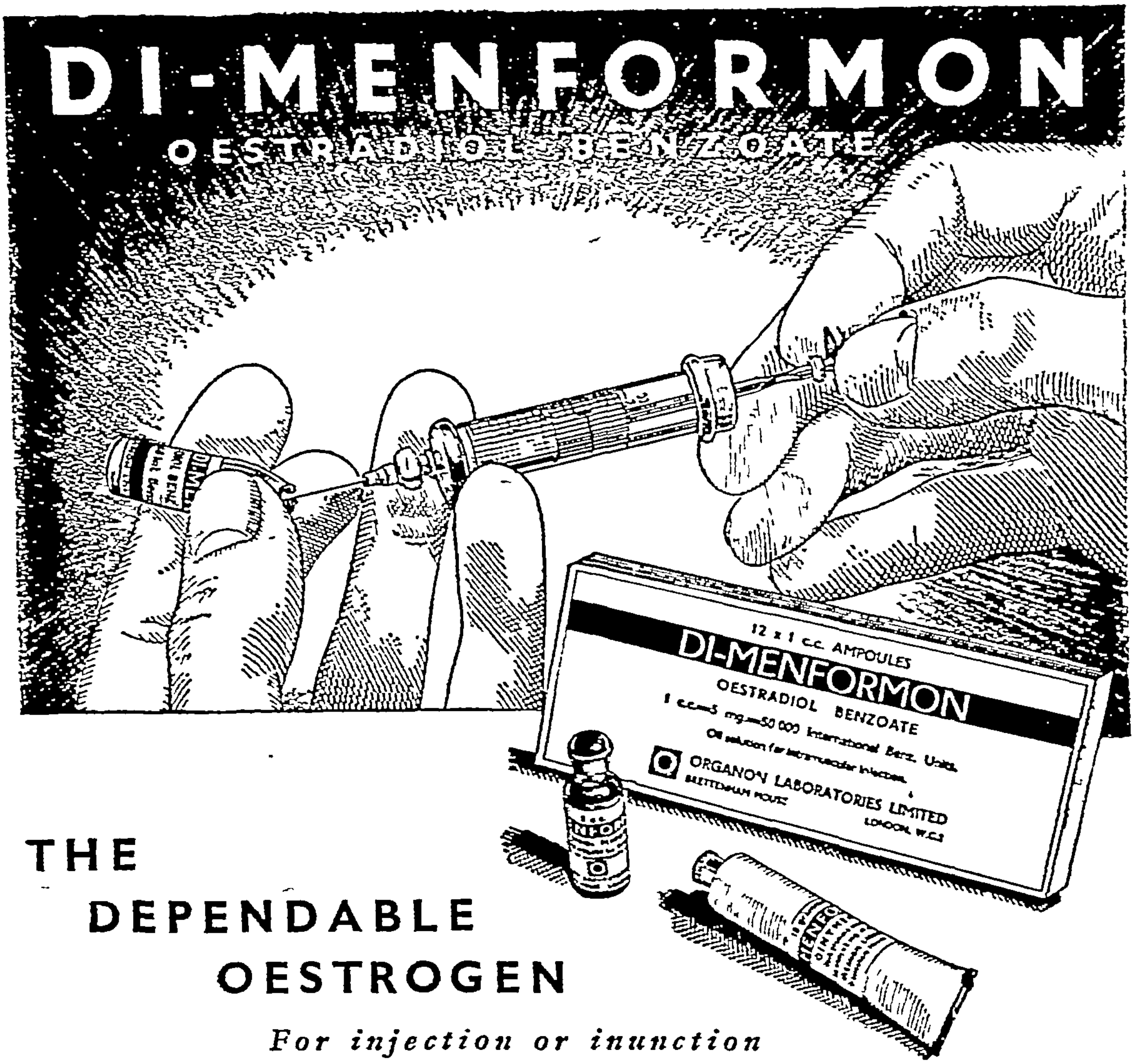
T. R. TOGNA. *Published by author.* Obtainable from W. H. Smith & Son. Pp. 48. 3s. 6d.

THE author gives a clear description and illustrates i detail the technique of the exercises which he uses t improve the circulation. The guiding principle is the provision of a sequence of rhythmical movements of the main skeletal muscles with minimum expenditure o nervous and muscular energy. Clinical experiments have shown that the oxygen requirement in water is only a half to a third of that for the same exercises performed in the air. The buoyancy of the water is used to lessen the work done against gravity when lifting the limbs and trunk. Mr. Togna has devised a system of muscular exercises which can be carried out in an ordinary bath with the body submerged in the water up to the neck The temperature is 94°–96° F. The time taken is 15–30 min., preferably on getting up in the morning, or in the evening before dinner. This is a simple and convenient form of hydrotherapy which can be carried out at home by healthy people who are getting on in years and are doing sedentary work, and by people who are suffering from articular rheumatism, and need help in maintaining the mobility of their joints.

Polipos Cervicais e Afecções Polipoides do Colo do Útero

LICINIO H. DUTRA. Sao Paulo, Brasil: Livraria Tecnica. Pp. 64 Cr. 30,00.

ONLY an experienced linguist will get the most out of this short publication, but some excellent illustrations with photomicrographs demonstrate the histology of benign and malignant cervical polypi in great detail. The author's observations are followed by 36 illustrative cases and there is an English summary at the end of the book which is well worth reading.


DI-MENFORMON
OESTRADIOL BENZOATE
12 x 1 c.c. AMPOULES
DI-MENFORMON
OESTRADIOL BENZOATE
1 c.c.=5 mg.=50 000 International Benz. Units
Oil solution for intramuscular injection
ORGANON LABORATORIES LIMITED
BRETTENHAM HOUSE
LONDON, W.C.2

THE DEPENDABLE OESTROGEN

For injection or inunction

AMENORRHŒA · CLIMACTERIC SYNDROME AND DEPRESSION · DYSMENORRHŒA · ENDOMETRITIS INFANTILISM · INHIBITION OF LACTATION JUVENILE MENORRHAGIA · KRAUROSIS VULVAE MAMMARY UNDERDEVELOPMENT · MASTOPATHIA · MENOPAUSAL ARTHRITIS · PRIMARY UTERINE INERTIA · STERILITY · UTERINE AND TUBAL HYPOPLASIA

AMPOULES AND VIALS 10,000 AND 50,000 I.B.U./CC.

OINTMENT 20,000 I.B.U./GM.

LITERATURE ON REQUEST

ORGANON

BRETTENHAM HOUSE, LONDON, W.C.2

TELEPHONE: TEMPLE BAR 6785 *TELEGRAMS. MENFORMON, RAND, LONDON*

DISCUSSION

These few experiments show that penicillin-sensitive organisms may survive in contact with commercial dried penicillin for a considerable time. Also that, under certain conditions, these mixtures when dissolved and injected into animals may cause a fatal infection. In this particular case when the solution had been allowed to stand for a short time the mixture was no longer infective, but other pathogenic species or strains more resistant to penicillin may remain viable for longer periods.

It is not suggested that the survival of organisms present in the material is a serious risk in the use of penicillin; experience has shown that this is not the case. However, to eliminate as far as possible all risk, it is advisable to use a sterility test which will indicate the presence of any viable penicillin-sensitive organisms in the dried penicillin. Also, it is clearly necessary for the clinician to use the same aseptic precautions for dried penicillin as for any other substance for parenteral injection.

SUMMARY

Dried pathogenic penicillin-sensitive organisms may remain viable for a considerable period—at least 10 weeks—in contact with commercial dried penicillin. This mixture when dissolved and injected into animals may cause infection.

In practice the risk of infection from contaminated dried penicillin is small, but it is sufficient to make it advisable to test the sterility of dried penicillin before use.

Reviews of Books

Topley and Wilson's Principles of Bacteriology and Immunity

(3rd ed.) Revised by G. S. WILSON, M.D., F.R.C.P., K.H.P., professor of bacteriology as applied to hygiene in the University of London at the London School of Hygiene and Tropical Medicine, director of the Public Health Laboratory Service; A. A. MILES, M.A., F.R.C.P., professor of bacteriology in the University of London at University College Hospital medical school. London: Edward Arnold. Pp. 2054. 2 vols. 60*s.*

"Topley and Wilson" (now happily back to the two volumes of the first edition) has become the standard work of reference for most laboratory workers and all interested in medical bacteriology and its application to the public health. Topley's assumption of the secretaryship of the Agricultural Research Council in 1941 and his death in 1944 placed on his colleague the task of bringing the book up to date; fortunately in Professor Miles, whose keenly critical mind and lively phraseology can be appreciated in the new edition, he found a worthy successor to Topley. Recent literature has been thoroughly combed, abstracted and digested, and presented to the reader in an assimilable form. Indeed, many of the chapters are concise monographs, whether the subject be the tubercle bacillus or the disease tuberculosis, the genus *Shigella* or bacillary dysentery, the bacteriology of milk or of water. Special mention may be made of the reviews on bacterial metabolism and bacterial variation, the new chapter on chemotherapy, the extension in our knowledge of anaerobes (a fuller discussion on the place of antitoxin in the prophylaxis and treatment of gas gangrene would have been welcome), new data on the salmonella family with a brief mention of the evidence incriminating dried egg for the introduction of fresh American types of salmonella to this country, the critical—perhaps over-critical—analysis of B.C.G. vaccination, and the chapter on the bacteriology of air and the control of respiratory infections. The authors must be admired for their industry and unfailing accuracy, for their critical analyses and sound judgment, for their courage and skill in tackling such topics as bacterial metabolism, disinfection, and statistical methods, and for devoting what spare time they had during the war to this task. It is pleasant, too, to be able to congratulate the publishers on the form and materials of the book.

Textbook of Ophthalmology

(3rd ed.) SANFORD GIFFORD, M.D., F.A.C.S., professo of ophthalmology, Northwestern University, Chicago London: W. B. Saunders. Pp. 457. 20*s.*

THE revision of this book, in which the essential of ophthalmology are compressed into 400 pages, wa completed by the author just before his death; ha he lived, he would undoubtedly have added a chapte on penicillin in ophthalmology. In every other way th book is up to date. The many colour-photographs o external eye conditions are an advance on anythin the artist's brush can produce, though for fundus illustrations colour-photography still leaves something to be desired. Professor Gifford was widely known for his sane views on debated subjects, and the chapter on the treatment and correction of myopia states outstandingly his common-sense opinions. Neither glasses nor exercises are curative of this condition, and it does no harm to say so in direct language. Because of its handy size, lucid text, and fine pictures, Professor Gifford's textbook must be considered one of the best students' manuals on the eye ever written.

Selected Papers from the Royal Cancer Hospital and the Chester Beatty Research Institute

Vol. III. London. Pp. 345. 16*s.*

THE third volume of selected papers contains its own warrant for collecting and reprinting these contributions to 16 different publications. Professor Kennaway's notes on the current literature of cancer research reveal how widely the papers are scattered and with how much irrelevant matter they are confused. Since his appeal was first made for more system both in publishing and abstracting cancer literature no move appears to have been made in this direction. Scattering is almost inevitable as the present volume shows. The subject has ramifications into several basic and applied sciences. The collection, classification, cataloguing, and abstraction of all that appears seems to be an obvious activity for the swollen funds available for cancer research. In the meantime we have here in pleasant and convenient form some papers that are especially valuable for medical readers. The aims and methods of measurement of radiation for medical purposes are lucidly set forth by Professor Mayneord. Articles on treatment of special sites and many papers on experimental research done in 1941–42 are included.

Everybody's Way to Health and Fitness

T. R. TOGNA. Published by author. Obtainable from W. H. Smith & Son. Pp. 48. 3*s.* 6*d.*

THE author gives a clear description and illustrates in detail the technique of the exercises which he uses to improve the circulation. The guiding principle is the provision of a sequence of rhythmical movements of the main skeletal muscles with minimum expenditure of nervous and muscular energy. Clinical experiments have shown that the oxygen requirement in water is only a half to a third of that for the same exercises performed in the air. The buoyancy of the water is used to lessen the work done against gravity when lifting the limbs and trunk. Mr. Togna has devised a system of muscular exercises which can be carried out in an ordinary bath with the body submerged in the water up to the neck. The temperature is 94°–96° F. The time taken is 15–30 min., preferably on getting up in the morning, or in the evening before dinner. This is a simple and convenient form of hydrotherapy which can be carried out at home by healthy people who are getting on in years and are doing sedentary work, and by people who are suffering from articular rheumatism, and need help in maintaining the mobility of their joints.

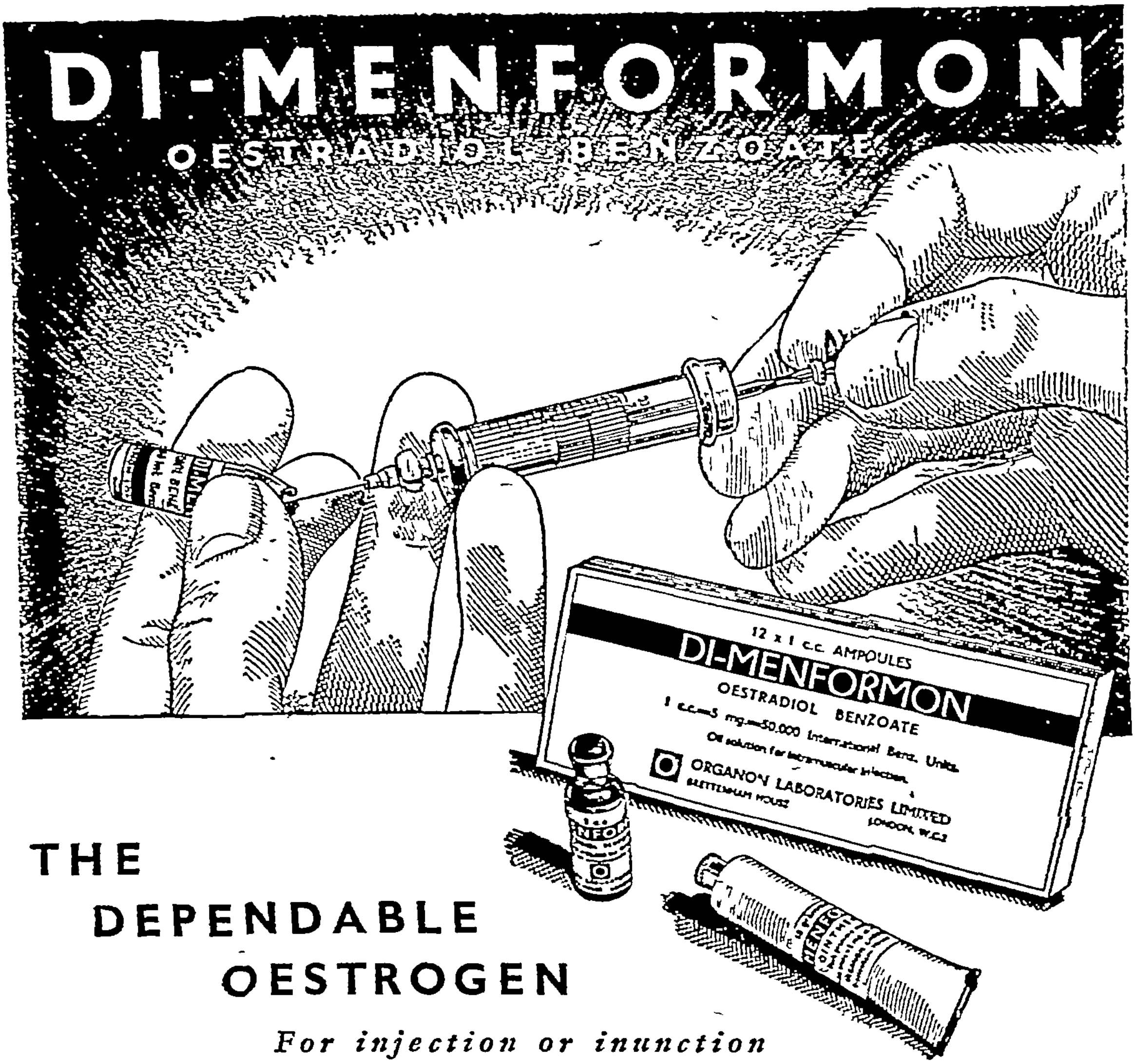
Polipos Cervicais e Afecções Polipoides do Colo do Útero

LICINIO H. DUTRA. Sao Paulo, Brasil: Livraria Tecnica. Pp. 64. Cr. 30,00.

ONLY an experienced linguist will get the most out of this short publication, but some excellent illustrations with photomicrographs demonstrate the histology of benign and malignant cervical polypi in great detail. The author's observations are followed by 36 illustrative cases and there is an English summary at the end of the book which is well worth reading.

DI-MENFORMON

OESTRADIOL BENZOATE


12 x 1 c.c. AMPOULES
DI-MENFORMON
OESTRADIOL BENZOATE
1 c.c.=5 mg.=50.000 International Benz. Units
Oil solution for intramuscular injection
ORGANON LABORATORIES LIMITED
BRETTENHAM HOUSE
LONDON, W.C.2

THE DEPENDABLE OESTROGEN

For injection or inunction

AMENORRHŒA · CLIMACTERIC SYNDROME AND DEPRESSION · DYSMENORRHŒA · ENDOMETRITIS INFANTILISM · INHIBITION OF LACTATION JUVENILE MENORRHAGIA · KRAUROSIS VULVAE MAMMARY UNDERDEVELOPMENT · MASTOPATHIA · MENOPAUSAL ARTHRITIS · PRIMARY UTERINE INERTIA · STERILITY · UTERINE AND TUBAL HYPOPLASIA

AMPOULES AND VIALS 10,000 AND 50,000 I.B.U./CC.
OINTMENT 20,000 I B.U./GM.
LITERATURE ON REQUEST

ORGANON

BRETTENHAM HOUSE, LONDON, W.C.2

TELEPHONE: TEMPLE BAR 6785 *TELEGRAMS. MENFORMON, RAND, LONDON*

Annotations

SURGICAL TREATMENT OF PAIN

THE study of the anatomy and physiology of pain has made remarkable progress in the last ten years, especially in this country under such prominent workers as Sir Thomas Lewis and H. H. Woollard, and in America, where H. G. Wolff,[1] by ingenious but fairly simple methods, has lately unravelled the puzzling mechanism of headache in a variety of clinical conditions. No similar progress has been made in the art of relieving the symptom. The general and local anæsthetics dispel pain nonspecifically by abolishing all forms of sensation. Morphine is more specific, as are the new drugs, such as pethidine, which are intended to replace it; but they carry the grave risk of addiction. With recurrent or persistent pain, as in trigeminal neuralgia and tabetic crises, the physician now calls on the surgeon to block or cut the pathways of pain sensation at one or several levels, but often this surgical treatment does not produce the expected relief, perhaps because of the subjective nature of the symptom. Psychologists have always found difficulty in classifying it as either a sensation or an emotion. Like other sensations, it has a threshold and can be localised and referred to a stimulus; but it is interpreted much closer to the centre of personality than other sensations, such as touch and hearing, and it has much in common with emotions like fear and disgust. Workers in sensory physiology have often tried to differentiate the sensory component from the "unpleasantness" or "reaction to pain" of the emotional element, which they have left to the consideration of the psychologist.[2]

The futility of dualistic classifications of pain is illustrated by the observations of Professor Freeman and Dr. Watts, published in our last issue. After observing in psychotic and neurotic patients the relief of "mental pain" by prefrontal leucotomy (the Americans prefer to call it lobotomy), they have attacked the emotional component where its appreciation is linked with the centre of personality—the frontal lobes. Logically, this is correct; but some of their examples provide little support for the operation because of the patient's hopeless or terminal condition at the time of operation and because of the admixture of psychiatric symptoms. By some it may be regretted that now, when the psychological aspect of somatic symptoms in general medicine is being increasingly recognised and understood, the neurosurgeon has stepped forward in readiness to deal with one of these symptoms. It would, however, be wrong to think that all psychological symptoms can be treated by psychotherapy alone. For the patient with severe hypochondriasis and crippling pain which is uncontrolled by psychological or physical methods, prefrontal leucotomy deserves consideration.

RUTIN FOR INCREASED CAPILLARY FRAGILITY

BOTANICAL sources for drugs influencing hæmorrhage seem of peculiar interest to American pharmacologists; after spoiled sweet clover as a source of dicoumarin, buckwheat as a source of rutin is proposed. Rutin has been used by Shanno[3] for the treatment of hæmorrhage due to increased capillary fragility. It is a crystalline glucoside that was isolated as long ago as 1860 by Schunck at Manchester, and it can be obtained in a reasonably pure state by recrystallisation. The rationale of its use for influencing capillary fragility is briefly as follows: Szent-Gyorgi separated from impure natural vitamin C a substance that, experimentally, corrected increased capillary fragility in guineapigs; this substance he called "citrin," or vitamin P; later, citrin was shown to be an impure mixture of two flavone glucosides, hesperidin and eriodictyol. (Neither of these glucosides, however, gave really satisfactory results; hesperidin has been the more extensively tested, but the results hardly aroused any enthusiasm.) Rutin is a flavone derivative with a chemical structure similar to hesperidin, and the possibility that this was the active substance in the citrin mixture led to these trials.

For testing, Shanno used Göthlin's technique of estimating capillary fragility: this consists in counting the petechiæ produced in a circle 6 cm. in diameter on the antecubital fossa below a blood-pressure cuff inflated to 35 mm. Hg for 15 min., and repeated, an hour later, at 50 mm. Hg. The dose of rutin was 60–120 mg. daily by mouth. A group of 24 hypertensive patients was tested. Thirteen of them, with hypertension and increased capillary fragility, showed a return to normal Göthlin fragility on rutin treatment. Of 11 hypertensive patients receiving thiocyanate treatment, 7 had normal fragility and maintained it when given rutin together with thiocyanate; 3 had developed increased fragility during treatment with thiocyanate, and rutin restored it to normal; 1, who had been given rutin for increased fragility and become normal, was subsequently given thiocyanate and rutin without relapse. Other conditions treated were: 2 cases of hæmorrhage from the respiratory tract for which no local lesion could be found, associated with increased capillary fragility, both of which cleared up with rutin treatment for some weeks; a case of thrombocytopenic purpura, unaffected by rutin; 3 cases of hæmorrhages due to drugs (sulphadiazine, gold, and aspirin), whose bleeding ceased with rutin treatment coupled with withdrawal of the offending drugs—a finding of doubtful value. Couch, Naghski, and Krewson[4] have investigated various plant sources of rutin and find that buckwheat, leaves and blossom, gives the best yield; they report the conditions of cropping and preserving for obtaining the best results.

Hæmorrhagic diseases associated with increased capillary fragility, as opposed to those due primarily to disturbance of platelet formation or the blood-coagulation mechanism, still present an intractable therapeutic problem; we hope that more detailed reports of the value of rutin will support these preliminary investigations.

YEAR'S WORK AT THE LISTER INSTITUTE

THE report[5] of the Lister Institute for 1945–46 lists a variety of investigations on pathological, biochemical, biophysical, and nutritional subjects. Work has continued on the alpha-toxin (lecithinase) of *Clostridium welchii* and on the pathogenesis of gas-gangrene. It has been shown that lecithin occurs in the contractile element of muscle, and this is of interest because of the early loss of contractility in muscle affected by gas-gangrene. Bacterial hyaluronidase, it appears, may consist of several enzymes, and this may have important effects on the ability of micro-organisms to attack and invade the animal body. Study continues on the nuclear structures of bacteria, on pyrogenic substances in materials used for transfusion, and on the immunology of trichomonas infections in cattle. On the biochemical side there has been progress in the study of human specific blood-group substances and the specific group O substance has been isolated. The structural chemistry of "gramicidin S" has been investigated and a tentative formula suggested. A fresh approach is planned in seeking the nature of the somatic antigens of gram-negative bacteria, and the search for better antitoxins goes on. In the biophysical section an attempt is being made to obtain a standard fibrinogen preparation for the assay of thrombin, and among the practical problems solved is the supply of fibrinogen, fibrin, and thrombin for the clinician. There is much to learn about the nutritive value of different food proteins, and it is encouraging to find that the proportion of the ingested nitrogen which becomes finally incorporated in the tissues of growing animals is increased from 23 to 27% as the degree of extraction of flour is raised from 70 to 100%. The nutritive value of protein hydrolysates and of milk substitutes for use as infant foods has also received attention, as have biological estimations of vitamins. These are a few of the useful findings published in some thirty papers during the year, and there is good reason for the feeling of the chairman of the governing body that the institute is well embarked on a career of new and expanding service to science and to the community.

---

[1] Wolff, H. G. *Arch. Neurol. Psychiat.* 1943, 50, 224.

[2] Guttman, E., Mayer-Gross, W. *Lancet*, 1943, i, 225.

[3] Shanno, R. L. *Amer. J. med. Sci.* 1946, 211, 539.

[4] Couch, J. F., Naghski, J., Krewson, C. F. *Science*, 1946, 103, 197.

[5] Report of the governing body, Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1.

IMMUNISATION WITH THE VOLE BACILLUS

THE vole bacillus, or the murine type of tubercle bacillus, occurs as a natural pathogen in some of the wild mice of Britain. It was first described by Wells[1] in 1937, when he was collaborating with Elton in a study of the diseases of voles in Great Britain. Tuberculosis in voles is a widespread disease, and is the only known instance of tuberculosis affecting wild animals in their natural habitat. The type of tubercle bacillus causing tuberculosis in voles is not pathogenic to the usual laboratory animals, the infection caused by the inoculation of the bacillus being transitory. This led Wells and Brooke[2] to investigate the question whether inoculation of guineapigs with the vole bacillus increased their resistance to subsequent infection with the human or bovine types of tubercle bacillus. Their experiments were interrupted at the outbreak of war and the animals had to be killed. At that stage of the experiment they concluded that vaccination of guineapigs with the vole bacillus gives a degree of protection against subsequent infection with virulent mammalian tubercle bacilli which *is apparently far greater than has been recorded by other* means.

The immunisation experiments in guineapigs have been repeated by several workers (Griffith and Dalling[3] in this country, Irwin and O'Connell[4] in Canada, Wahlgren et al.[5] in Sweden, Corper and Cohn[6] in America, and Birkhaug[7] in Norway). The methods employed differ widely, but all agree that a pronounced increase of resistance to infection with virulent tubercle bacilli follows inoculation with the vole bacillus. It is quite clear, however, that in the guineapig resistance does not amount to immunity. The effect of inoculation is a delay, often very considerable, in the establishment of generalised disease after infection with virulent tubercle bacilli, but death from tuberculosis eventually follows. The painstaking work of Birkhaug makes this abundantly clear. The average survival time of twelve unvaccinated guineapigs after infection with virulent tubercle bacilli was 192 days, whereas that of twelve animals vaccinated with the vole bacillus before infection was 403 days.

It is still uncertain how the resistance conferred on guineapigs by vaccination with the vole bacillus compares with that produced by B.C.G. The results of Wells and Brooke, of Irwin and O'Connell, and of Wahlgren and colleagues, suggest that in the earlier stages of artificial infection vaccination with the vole bacillus produces the greater resistance. Corper and Cohn, and Birkhaug, on the other hand, have found that the resistance conferred is about equal, if the animals are allowed to survive. It is very doubtful if immunity experiments in tuberculosis in the guineapig can be translated into terms of human immunity. The guineapig is absolutely susceptible to infection with mammalian tubercle bacilli and shows no natural resistance to progressive infection. In man, natural resistance, or resistance acquired as a result of previous infection, can completely overcome a tuberculous infection. In other words, infection in the guineapig is inevitably fatal; whereas the result in man is determined by the balance between natural or acquired resistance and the infective process. An increase in resistance in man may lead to healing of the infection; an increase in resistance in the guineapig merely delays its death.

There are several questions still to be answered before the vole bacillus can be considered for human vaccination. Is it incapable of producing progressive disease in man? Will it convert a negative reactor to tuberculin into a positive reactor, and how long does this sensitivity last? Can human vaccination with the vole bacillus be done without causing severe local or general reaction? Does human vaccination confer increased resistance to tuberculosis? It is hoped that the first three questions may soon be answered. The last question is vital, but the answer may be delayed for some time. Evidence of this nature is notoriously difficult to collect, and careful planning will be needed if the answer is not to be indefinitely postponed.

---

1. Wells, A. Q. *Lancet*, 1937, i, 1221.
2. Wells, A. Q., Brooke, W. S. *Brit. J. exp. Path.* 1940, 21, 104.
3. Griffith, A. S., Dalling, T. *J. Hyg., Camb.* 1940, 40, 673.
4. Irwin, D., O'Connell, D. C. *Canad. med. Ass. J.* 1943, 48, 486.
5. Wahlgren, F., Olin, G., Widström, G. *Nord. Med.* 1944, 22, 943.
6. Corper, H. J., Cohn, M. L. *Amer. J. clin. Path.* 1943, 13, 18.
7. Birkhaug, K. *Amer. Rev. Tuberc.* 1946, 53, 411.

BICENTENARY OF THE LONDON LOCK HOSPITAL

AT the time the London Lock Hospital was founded 200 years ago, there were two ancient lock hospitals still functioning in London—all that remained of the seven lazar-houses granted to St. Bartholomew's Hospital by Henry VIII at the time of the dissolution of the monasteries.

Locks, lazars, or outhouses were a recognised feature of the medieval hospital system of England. They were built by the pious especially for the treatment of lepers, because these outcasts were not admitted to the buildings attached to the monasteries reserved for the sick, the halt, and the blind. Instead, for them, wandering along the highways of medieval England with their begging-bowls and rattles, special lazar-houses were erected close to the monastery gates; and there at sundown the real lepers as well as the men covered with the foul ulcers of untreated scabies, the victims of lupus and rodent ulcer—all loosely diagnosed as lepers—were segregated. Outside the lazars, baskets of rags, lint, or wool were placed so that the lepers might wipe their sores before admission. The baskets were *les loques* (French for rags) and the lazars in Norman England came to be known as *les locks*. But when leprosy declined in Europe, and especially in England, towards the end of the 15th century, the lazar-houses became almost empty; and it was then as it happened that syphilis burst upon an unprepared world. Naturally the lazars were hastily turned over to the treatment of venereal disease; and the few remaining lepers were quickly swamped by the victims of syphilis. It is believed that it was in this way the word "lock" became associated with venereal disease.

Certainly there is no doubt that the hospitals for lepers became hospitals for venereal disease. Up to 1813, for instance, there was a plaque on a tumbledown building in Southwark labelled "The Chapel of the hospital for lepers, Le Lock, dedicated to St. Mary and St. Leonard. Founded prior to the 14th year of Edward II." This belonged to the old lock hospital for men in Kent Street, vacated by St. Bartholomew's in 1760 after 2½ centuries of use as a venereal hospital. It was returning from this hospital that Percivall Pott is said to have broken his leg, for the surgeons of St. Bartholomew's were surgeons to Le Lock from the time of Thomas Vicary until its extinction. It was possibly the knowledge that the lock hospital in Kent Street and the "spital" for women in Kingsland were about to be done away with, coupled with the great increase in venereal diseases in outer London, that induced William Bromfeild (1713–92), surgeon to St.

George's Hospital and the Princess of Wales, to decide that he ought to start a hospital for the treatment of venereal diseases in the West End. His court appointment enabled him to acquire royal patronage, and to collect around him an influential committee of noblemen and gentlemen with whose aid he started the London Lock Hospital in what afterwards came to be called Chapel Street, halfway down Grosvenor Place from St. George's Hospital itself.

The first meeting of the committee was held on July 4, 1746, and a house belonging to a Mr. Cooper was bought with the remains of a 99 years' lease from Sir Robert Grosvenor for £350 and a ground rent of £10 annually. The site was then an open land infested by footpads at night and the scene of occasional duels by day. And there the hospital remained until its lease expired in 1840. The Grosvenor estate by then had greatly changed its character. It had been built over and become fashionable. It was thought, therefore, that a hospital of this nature was undesirable in the area, and the governors were given notice to vacate by the then Marquis of Westminster. This made the board decide to obtain a freehold for the hospital in the future, and after some delay they found a site on Westbourne Green which they bought from the executors of Mrs. Siddons, the famous actress, who had a cottage there. The hospital accordingly reopened in Harrow Road in 1842 and its main activities were carried on there. Outpatients from other parts of London, however, found Harrow Road difficult to get at, so the site of St. Paul's Mission College in Dean Street, Soho, was bought and adapted for hospital use, the first outpatients being seen in July, 1862. Just before the 1914–18 war this antiquated building was pulled down and the present hospital was built on the site. Elaborate extensions were made in 1926 to bring the building and equipment up to date, and when in 1940 the Harrow Road Hospital was commandeered by the War Office, activities were concentrated in Dean Street. Considerable damage was done to the buildings during the blitz, but the work went on without interruption throughout the war. The hospital has now weathered its first 200 years, and its work seems to be steadily increasing.

AMERICANS FROM JAPANESE PRISONS

PRISONERS-OF-WAR have shown fewer signs of mental stress than we had been led to expect. Indeed, it seems likely that most of them meet their abnormal experience in ways which, while they may deviate a little from those of the untried mind, are yet the normal response to that particular situation. But as with other stresses, it takes a sound mind—and, in the case of prisoners of the Japanese, a sound body—to survive unharmed. Three years in Japanese prison camps seems to have had little effect on the minds of some 4000 American soldiers now repatriated.[1] When they landed in the United States these men were received by teams of medical specialists from the office of the Surgeon-General, and a report on their neuropsychiatric condition has just been made by Lieut.-Colonel N. Q. Brill. In spite of starvation rations and frequent beatings during their imprisonment these men had survived, though many of their comrades, in about the same physical condition when captured, had succumbed. The psychiatrists found nothing to explain this difference in endurance except a "will to live" in the survivors.

They lived only for the day and at once ate what came their way. Men who began to hoard their rice allowance for several meals in order to enjoy the sensation of one good meal were described as "rice happy." Such hoarding was usually a sign of crumbling fortitude, and the man who showed it was likely to die before long. If they became ill those who were less determined to live would often stop eating entirely and die in a few days. The common factor among the survivors, who were otherwise widely different in character, was that they never gave up their struggle to live. "They ate anything available, including cats, dogs, silkworms, and other things repulsive to normal human beings," Colonel Brill reports. "When struck with dysentery and malaria they would nevertheless attempt to carry on. This strength and courage had no connexion with social background or education."

The men have no doubts about their ability to resume normal life: after three years in the camps, they felt they would be equal to any situation likely to arise at home.

TACTICAL APPROACH TO LEPROSY

Dr. T. F. Davey last week described precisely how leprosy is tackled in a province of Nigeria (Owerri) where there are some 70,000 lepers. The general plan is to attack the disease in each clan or locality, developing a local campaign as self-contained as possible. The first step is to appoint a local organiser, the "leprosy inspector," whose initial duties include preparation of a *detailed map and inquiry into local beliefs about leprosy.* Next comes propaganda: public opinion has to be enlightened through schools, meetings of chiefs, visits to villages, posters, and booklets. With the ground thus prepared, the third step is to open a clinic, offering local patients free treatment of leprosy, of its complications, and of associated ailments, free hospital care being provided at a central settlement for those who need it. This clinic is staffed by one or more resident nurses (themselves patients), working with the leprosy inspector, and is visited by specialist staff from the central settlement: the site must be given by the people themselves as a sign of their coöperation.

"Although," said Dr. Davey, "the clinic quickly becomes the centre of the lives of local patients, who render much voluntary service in its maintenance, its value from the public-health standpoint is limited, as leprosy treatment is only partially successful with the more severe types of leprosy, and treatment alone will not stamp out the disease." The fourth stage in the campaign, therefore, is the segregation of infectious patients—if possible in a model village or hamlet which should be an object lesson in sanitation and organisation. "This is the most vital and by far the most difficult step in the programme. It is no small thing for a man to leave the village of his fathers and move to a new village, residence at which stamps him as a sufferer from leprosy. The fact that between 3000 and 4000 have done so in Owerri Province is evidence of their readiness to coöperate." The fifth stage, which can be undertaken only by the general wish of the clan, by invitation, village by village, is to make a leprosy survey to discover hidden cases and assess the situation. Though a survey team is available for areas of special difficulty or interest, the usual custom is for the leprosy inspector to go from house to house, taking a census as he goes—a process which may take some two years, so that it is then time to start again. If each case is treated with sympathy, and family difficulties are smoothed out, it is generally possible to induce the vast majority of sufferers—maybe all—to isolate themselves, and when this has been achieved the decisive stage in leprosy control has been passed. The sixth or final stage of the campaign is its maintenance, with special emphasis on the observation of child contacts.

Dr. Davey was speaking at the annual meeting in London of BELRA, the British Empire Leprosy Relief Association, which has made this work possible not only by advice and encouragement but by providing staff, including a doctor, a nursing sister, and a succession of Toc H volunteers who act as accountants, dispensary workers, organisers, and supervisors of clinics and model villages. During the last two years the resources of the Colonial Development Fund have been thrown into the fight: staff have been absorbed into the Nigeria Leprosy Service and in Owerri Province it is hoped to extend the six-point programme over the whole area. But though the government's assumption of full responsibility is profoundly satisfactory, mere compulsion would be worse than useless; and in leprosy, Dr. Davey believes, a government needs the help of voluntary organisations in the work of personal contacts and social welfare. "Leprosy is a key disease. The attack on it opens the door to a higher standard of health on the part of the entire community, and in its various aspects governments, missions, and BELRA have all a vital part to play." He is convinced that "working together we may see in our lifetime the conquest of humanity's most ancient disease."

---

[1] News Notes. Office of Surgeon-General, Washington, May 15, 1946.

INTRACAPSULAR EXTRACTION OF CATARACT

THE lens had been expressed from the eye complete in its capsule before that time, but intracapsular extraction of cataract was first systematically employed by Colonel Henry Smith[1] in India at the beginning of this century. The extracapsular operation, in which the anterior lens capsule is cut and the nucleus expressed, leaving the posterior capsule intact, had been the undisputed method since Daviel[2] first described it in 1748, and indeed is still the operation most often performed. Smith had observed that when the lens inadvertently came out of the eye in its capsule, convalescence was short and the visual result good, and in 1903 he began to use this as a routine procedure. His technique was to rupture the lens zonule by pressure from without with a squint hook, and then to express the lens from the eye by pressure from below and gentle counter-ressure above the section. This, the Smith-Indian method of tumbling the cataract, is still used in some ountries, but here it has been superseded by the forceps peration, in which the lens capsule is picked up in pecial forceps without rupturing it, the zonule broken y gently rocking the lens from side to side, and the ens in its capsule withdrawn from the eye with the help f external pressure from below.

At first Smith found little support in England. The esponse in Scotland was more enthusiastic; and he was encouraged by Herman Knapp, of New York, who wrote in 1905, after Smith had described his method in he American *Archives of Ophthalmology*, "If you can stablish a safe method of intracapsular extraction of ataract, you will be a greater benefactor to mankind han Daviel. If I were not over 70 years of age and n infirm health, I would go round the world to see how o do it." On the other hand, the president of the phthalmology section of the British Medical Association, at its meeting in Swansea in 1903, said, after Smith had poken, "I believe there is a deep-rooted opposition o this procedure in the meeting." Smith himself was not to be deterred by such a cold douche, and by 1910 he had published his first book, in which he described his experience of some 25,000 patients treated by his method. He foresaw then that one day his procedure would be used throughout the world, and it now seems as though his words may come true.

For extracapsular extraction it may be said that it is easier and less likely to cause prolapse of the vitreous humour, since the posterior lens capsule usually forms an effective barrier. On the other hand, it has the disadvantage that some lens cortex remains in the anterior chamber to be absorbed, and restoration of good vision may thus be long delayed; moreover, the lens protein is liable to irritate the eye and set up an iritis which prolongs convalescence. Finally, needling is often necessary after the operation. None of these drawbacks are encountered after intracapsular extraction, with which the result is more immediate and convalescence easier; this method has the added advantage that it is unnecessary to wait for the cataract to ripen before operating. But it is not practicable with all cataracts. Below the age of forty-five, the lens zonule is too strong to allow of its being ruptured without damaging other structures in the eye, and in patients with an intumescent cataract it is not easy to pick up the lens capsule without rupturing it.

ROYAL SOCIETY OF MEDICINE

Sir Gordon Gordon-Taylor, president of the Royal Society of Medicine, is at present occupying the chair of surgery at Harvard for a complimentary period. While in America he is conferring the society's honorary fellowship on two of the five recent recipients—Colonel L. C. Montgomery, R.C.A.M.C., and Colonel W. S. Middleton, U.S.A.M.C. The others are Sir Alan Newton, of Melbourne, Group-Captain Antoni Fiumel, late D.G.M.S. of the Polish Forces, and Colonel C. F. Koch, late D.G.M.S. Netherlands Forces; and the two last, both of whom escaped to England during the German occupation of their countries and made many friends here, were admitted by Sir Henry Tidy, past-president, at the annual meeting last Tuesday.

Sir Henry was able to report an annual rise of almost 10% in the society's membership during recent years, the total now standing at 8129. He spoke especially of the work now being undertaken, with the aid of a grant of £61,725 from the Rockefeller Foundation, for the restoration of medical libraries in liberated countries; of the efforts being made to bring visitors from abroad into touch with their colleagues here; and of various ways in which the society is collaborating with other bodies. Mr. J. B. Hunter, as hon. treasurer, forecast considerably higher expenditure in the near future on the library.

Sir Maurice Cassidy, consulting physician to St. Thomas's Hospital, was elected president for 1946–47. After five years' service Dr. Charles Harris is retiring from the post of hon. secretary, and the new hon. secretaries will be Mr. R. H. O. B. Robinson, F.R.C.S., and Mr. W. A. Pool, M.R.C.V.S.

AMALGAMATION OF MANCHESTER MEDICAL SOCIETIES?

THERE have been and still are many medical societies in Manchester covering most branches of the profession, and an attempt is now being made to bring these together into one inclusive Society of Medicine of which existing societies may form sections and for which new sections could be formed as required. The scheme follows closely that of the Royal Society of Medicine in London, which is now giving friendly and valuable advice on the subject. The extensive area of Manchester lying between Oxford Road and Upper Brook Street—an area in which several big hospitals, including the Royal Infirmary, already lie—has been marked out in the town-planning scheme as a medical centre. Here ultimately hospitals, nursing-homes, and the medical school of the university may congregate. The supporters of the amalgamation scheme wish to have here a worthy building where meetings of all sections of the proposed society may be held, where postgraduate and other lectures may be given, and where the Medical Library may be housed. This library, claimed to be the biggest medical library in England outside London, was formerly the property of the Manchester medical society, but was passed over to the university some fifteen years ago with certain rights of user retained. If matters can be arranged between the university, the local branch of the British Medical Association, and the various societies already existing, an institution worthy of a great city and a large medical school should be possible.

---

[1] Treatment of Cataract and some other Common Ocular Affections. London. 1928.

[2] *Mém. Acad. Chir., Paris*, 1748, 2, 1.

Special Articles

MEDICINE AND INDUSTRIAL SAFETY

Prof. HERMANN LEVY

INDUSTRIAL safety covers the application of devices to prevent personal injury from accident or disease. Safety measures in mines, fencing of machines, dust extractors and exhaust fans, respirators, better light, caps for women, protective clothing, skin protection, all protect workers against risks due to external circumstances—what Swinburne calls "the malice of things." In that respect they are technical, and legislators and administrators have been apt to concentrate mainly on the technical and mechanical factors involved. Nevertheless the Factory Department, which deals with the carrying out of the constantly increasing number of statutory safety regulations, and the Royal Society for the Prevention of Accidents have long recognised that the value of safety devices is greatly reduced if managers and employees do not exercise constant personal vigilance and care in their application.

The fact that in spite of all technical achievements in industrial safety the wastage of man-power caused by industrial injury has remained appallingly high—a fact proved by a statistical investigation made by the International Labour Office in 1938—shows that the purely technical approach to this question is not sufficient. Industrialists are beginning to recognise that this is so. Not long ago a Canadian industrialist declared: "The bulk of our present-day machines come to us already guarded in every possible way, but in spite of these guards accidents continue to occur with a sickening regularity."

THE HUMAN ELEMENT

Experiences such as these have prompted the Canadian accident-prevention associations, set up under the Workmen's Compensation Act of Ontario, to inquire how far the "human element" should be considered responsible for the frequency of injury. This attitude should not be interpreted as putting the blame on the worker instead of blaming "the malice of things"; it simply shows the increasing recognition of the personal factors involved in every single industrial accident or injury.

A recent investigation made by the Dominion Engineering Co. of Montreal revealed that only 5% of the accidents investigated had been due to lack of supervision, 15% being attributed to faulty housekeeping and 80% to the human element. Of these 80% the cause was given as mental aberration, in other words forgetfulness and carelessness, in 75%. "But," a member of that company asked, "why do people forget? Why are people careless? If we had the answer to that, we would have the answer to the prevention of industrial accidents as well as the reason for a lot of troubles and miseries of this world."

To ask how and to what extent the human element is involved in the problems of industrial safety immediately leads us away from the merely mechanical side of the problem and discloses the important rôle of medicine in this matter.

This side of industrial safety has of course not been overlooked entirely. An important start was made towards the end of the 1914–18 war, when the Medical Research Council set up the Industrial Fatigue (now Industrial Health) Research Board. Since then much important work has been done bearing immediately on the prevention of personal industrial injury; it related to fatigue, speed, eyestrain, monotony of work, dexterity, psychological effects of noise, warmth, lighting, and personal qualities such as accident-proneness and proficiency.

Medicine also became concerned with the immediately practical issues of industrial safety when regulations requiring medical examination of entrants into indust were made. It is obvious that in this field medici can render an enormous service to industry. If the examinations were to be made with special regard accident-proneness, a good many injuries could prevented; but hitherto they have been limited to t statutory examination of new employees under 16 yea of age and, under the Workmen's Compensation A of workers wishing to be employed in special processe mostly in the sandstone, pottery, and asbestos industrie

There is as yet no general or comprehensive schen to link medicine with industrial safety, and it is doubtf whether the suggestion made by the Factory Departme of the Ministry of Labour, that "it may well be to t advantage" of both the employee and the employer th "in certain cases" the employee should be medical examined and advised about his suitability for t particular job proposed, will be followed at all extensivel Agreements have been made in certain industries—e. the coke-oven industry—between employers a employees which provide for medical examination workers exposed to tar and its products. This is a hop ful beginning, but little has yet been heard of applyin medical science and practice to deal with that aspe of industrial safety which concerns the human element.

Science, though highly advanced in respect of technic devices to prevent accidents, is still in its infancy regards the human element involved in industrial safet It is here that, in the future, medicine must first consulted. Research undertaken by the Industri Health Research Board into accident-proneness reveale that, if a large number of people are exposed to the sam risks, 75% of all accidents occurring among them happe to a small minority of the group, possibly consisting as few as 10%—in plain language, to the "all thumbs people. But another branch of medicine assures employe that fully rehabilitated partially disabled persons ca after training, do the same jobs as those not disable and may even meet with fewer accidents. America statistics have proved this in various large industri establishments. Here, apparently, we have two view which at first can hardly be reconciled. On the on hand, the employer is told that he does not run an risks in employing workers who have already met wit an accident; on the other, he is assured that it is mor or less always the same people who meet with accident and that multiple accidents are the rule. The answe to this riddle is that some workers, owing to accident proneness, either physical or psychological, are unfit fo certain jobs but, after rehabilitation, can safely b employed in other jobs.

JOB ANALYSIS

The Industrial Health Research Board suggests th removal of accident-prone workers "to safer places and expects that this would have "a big effect o accident reduction." But this selection of occupatio requires knowledge of what such persons can do withou risk, a knowledge not only of their physical and fun tional abilities to work but also of the kind of wor best suited to them. It is here that job analysis come into the picture; but to choose the right job for a worker or to pick the right worker for a specific job, is by n means a matter solely for the technical and industria management to decide. Job rating has been define as the analysis of a job to determine the degree of skill effort, and responsibility, and the working conditions i relation to other jobs in the same plant—i.e., the huma requirements of a particular job. When we know thi we may be able to choose the right worker for the job, but this task presupposes the collaboration of medical judgment. Job rating must coincide with man rating.

Job analysis should have developed long ago apart from the special aim of placing the disabled; but it was not until the progress in physical and functional rehabilitation impressed physicians and surgeons with the necessity of placing the disabled person in a job with as much guarantee for his future safety as possible that job analysis found its way into sociomedical considerations. It is now one of the main aims of the newly formed British Council for Rehabilitation. There can be no doubt that job analysis properly carried out can reduce accidents and thus promote industrial safety, besides improving the workers' efficiency.

HOME SURROUNDINGS OF WORKERS

It is with the effect of job analysis on industrial safety, and through this on industrial health, that medicine is chiefly concerned; and the scope of medicine will be enlarged when the problem of industrial safety is not narrowly confined to conditions inside the factory but also considered in relation to the total sociomedical aspects of the workers' life. The worker least liable to industrial injury, so far as the human element is involved, is the worker living in healthy surroundings—a fact which implies that accident prevention is intimately connected with social medicine.

Psychosomatic Illnesses.—Some of the psychosomatic illnesses, such as peptic ulcer and gastro-intestinal disorders, asthma, hay-fever, high blood-pressure, arthritis, and the common cold, as well as various skin conditions, such as warts and allergic reactions, have never been considered in connexion with the patients' work. Nevertheless it has been pointed out at a conference of industrial accident-prevention associations in Canada that a person suffering from them cannot be an effective workman and "the mere fact that he is resentful or anxious, that his mind is not at rest, that he is nervous, reduces his efficiency and makes him allergic to accidents." The moral is that medicine should tackle industrial safety in the workers' homes and include accident prevention as a part of general health.

Worries.—The same may be said about "worries," which may conduce to the frequency of accidents. Such worries may be intimately connected with accident-proneness, and perhaps nobody is better fitted than the doctor, especially the family doctor, to dispel some of them. There are certainly many emotional tensions of the workers which are unconnected with medical problems; others, however, are directly due to psychophysical conditions which the doctor may remove or reduce; and he may try to alleviate the effect on health which non-medical worries may produce, and thereby prevent the deterioration of the worker's professional efficiency and his possible accident-proneness.

Rheumatism.—Some big establishments in the mining industries are giving special attention to the incidence of rheumatism and have engaged specialists to reduce its incidence. The Empire Rheumatism Council has arranged with collieries to establish treatment centres for rheumatism at the pit-head baths. In a study of arthritis in women, Fortescue Fox pointed out that disability from arthritis was minimal where *home* and *working* conditions were good; in a certain investigation only a small proportion of arthritics visited were living under good conditions at the outset of the illness, and good results were often produced by improvement of the conditions. This is yet another example showing that industrial safety cannot be divorced from home conditions.

Medical Guidance in Choice of a Job.—We have as yet few data on which to base the claim that the progress of industrial safety is closely linked with the medical side of job analysis; but the report of the Department of Health for Scotland for 1943 has shown that many men invalided out of the Army adopt work "full of accident risk" when left to their own choice—an epileptic, for instance, becoming a stoker, or a man with severe splenic anæmia driving a bus. The report emphasises the necessity of giving due care to the "social, medical, and occupational aspects" of the employment of partially disabled or handicapped persons. How many people who get seasonal hay-fever know that, in the words of E. M. Fraenkel, "the monovalent allergy may become polyvalent," that they may become sensitive to moulds and dust, and that their jobs should be adjusted to this condition?

In an important study of *Job Placement of the Physically Handicapped,* which has just been published, an American author, Clark D. Bridges, observes that "workers' ill health is responsible for ten or fifteen times as many lost days as accidents, but, until recently, has been one of the least appreciated and consequently one of the most neglected considerations in employee placement." To this criticism we may add that if more attention were given to the preservation of the worker's health with a view to accident-proneness there would be fewer accidents in industry.

THE DOCTORS

If we are to remove industrial safety from the narrow corner of technical accident prevention to the broad platform of general health, doctors will have to accept the main implications and obligations of this change.

Surgical Specialists.—We already owe much to specialists, particularly those rehabilitation surgeons who, like Hugh E. Griffiths, through the British Council for Rehabilitation, are now promoting job analysis on a wide scale. But surely job analysis must not be confined to people disabled by fractures. Persons afflicted with industrial disease or with neurotic or traumatic mental disorders require just as much careful occupational placement to prevent them from being a potential risk to themselves, their fellow-workers, and industry as a whole.

Works doctors also should be closely interested in industrial safety. They are in the best position to estimate the medical requirements of industrial safety in specific industries. Their work would be more successful as regards the "human element" in accidents if they could claim to be as much the workers' as the firms' servants. This could be achieved by giving workers' representatives a say in their appointment. Their number, now some 250 whole-time and over 700 part-time doctors, should be much increased.

General practitioners should play their part in promoting industrial safety; but they should be better paid, less harassed, and able to give more time than at present to such special services as the treatment of persons with a view to their safest employment. General practitioners specially interested in sociomedical and occupational problems should be encouraged, under any scheme of national health service, to take up this work and should be given facilities for research work. In this respect Britain has hitherto lagged far behind some other countries, which have intimately linked their industrial accident insurance administration with accident prevention and medical treatment. In some other countries workmen's compensation boards or statutory associations of employers and employees concerned with the treatment, rehabilitation, and re-employment of disabled persons collaborate closely with the medical profession.

It is regrettable that the new national insurance schemes have no place for accident prevention and medical treatment, both of which are left to agencies other than those of social insurance. Other countries have in their legislation rightly recognised that industrial safety and medical treatment of the injured should be linked with the duties of those most closely concerned, and the result has been that the requirements of both, as they vary from industry to industry and occupation to occupation, have been met by expert technical and medical specialisation. Under the new social insurance (Industrial Injuries) scheme not only is this link missing, but (worse still) employers lose the incentive to further industrial safety which might have been provided by the system of "merit rating." This omission may discourage employers from engaging more works doctors or from undertaking measures of industrial health and safety beyond the bare legal requirements, since expenditure incurred on these objects will not be rewarded by reduction of insurance rates. Hence it becomes more and more important for the medical profession to prove that legislation for industrial safety, going far beyond its present scope, must be enacted; that it must be related much more than hitherto to the human element; and that the field of industrial medicine must be extended from the factory to the worker's home.

BIBLIOGRAPHY

Association of Industrial Medical Officers (1945) Report of Education Committee on Education in Industrial Health.
Board of Trade (1945) *Provision of Employment in South Wales for Persons suspended from the Mining Industry on account of Silicosis and Pneumoconiosis.*
Bridges, C. D. (1946) Job Placement of the Physically Handicapped, New York.
Department of Health for Scotland (1943) Health and Industrial Efficiency.
Fox, R. F. (1936) Arthritis in Women, London.
Fraenkel, E. F. (1943) *Brit. med. J.* 1, 216.
Industrial Accident Prevention Associations (1945) Report of Annual Meeting, Toronto.
Industrial Welfare Society (1942) Health Services in Industry.
International Labour Office (1938) Industrial Accident Statistics, Geneva.
— (1945) Training and Employment of Disabled Persons, Montreal.
Medical Research Council (1940) Industrial Health in War, London.
— (1942) Personal Factor in Accidents, London.
— (1945) Health Research in Industry, London.
Ministry of Labour (1940) Medical Supervision in Factories.
Minton, J. (1946) *Brit. med. J.* 1, 211.
Schmidt, L. (1942) *Brit. J. phys. Med.* 5, 145.
Wilson, A., Levy, H. (1941) Workmen's Compensation, London, vol. II.

NUTRITION IN GERMANY

THE PRESENT SITUATION

ON June 15 we referred to the latest findings of Colonel W. L. Wilson (U.S.A.), Sir Jack Drummond, F.R.S. (Great Britain), and Inspector-General G. Coulon (France) who formed a tripartite committee of investigation with the assistance of Colonel W. H. Sebrell and Lieut.-Colonel W. F. Ashe (U.S.A.), Dr. H. M. Sinclair and Mr. J. B. Lockwood (Great Britain), and Lieut.-Colonel M. Roche and Dr. G. Pierron (France). The following is a fuller summary of their report issued in Berlin on June 3.

FOOD CONSUMPTION

Groups of people were observed, and records studied, in Stuttgart, Kassel, and Bremen (United States zone), Hamburg, Hanover, Düsseldorf, and Essen (British zone), and Coblenz, Saarbrück, Freudenstadt, and Schromberg (French zone).

A large proportion of the population in these towns evidently get food in addition to the authorised rations, the well-to-do succeeding better than the poor. Most of this supplement is in the form of potatoes. In their first report (August, 1945) the committee recommended a calorie value of 1550 for the ordinary consumer, and this was approximately achieved at the beginning of this year; but it became necessary to reduce rations in the French zone in February, and in the British and American zones in March and April. Rations had previously been sufficient to protect town populations against starvation and to prevent serious malnutrition, but with no margin of safety. On the reduced rations the greater part of town populations are in danger, and with the threat of semi-starvation a greater proportion of supplementary foods will be diverted to the richest. Well-to-do families have been able to get 1000 calories per head daily to supplement a ration of 1000–1200 calories, thus meeting the minimum energy requirement of 2000 calories. Those who are unable to add more than 100–200 calories to the ration will show rapid loss of health and strength, as civilian internment camps have demonstrated.

STATE OF NUTRITION

Nutrition has significantly deteriorated since rations were reduced. Children under three years of age seem to be adequately nourished except in respect of vitamin D and iron. Nearly all get their milk allowance and their calorie needs are met. Rickets is becoming commoner in some areas, however, where supplementary vitamin-D products or cod-liver oil have not been obtained, and nutritional anæmia is increasing. The calorie needs of children between three and six are met in the British and United States zones, but the incidence of rickets is unduly high. The position is less satisfactory in parts of the French zone. Among children and young people between the ages of six and eighteen calorie deficiency has retarded or arrested growth. The children are generally underweight, and some are losing weight. Malnutrition due to deficiencies of vitamin A, riboflavine, and ascorbic acid is prevalent, and anæmia is common. For ordinary consumers the ration of 1550 calories, achieved before February, barely sufficed, when supplemented with unrationed foods, to maintain health. Since the reduction, their physical state has deteriorated, the poorer people suffering most. Adults are losing weight, and famine œdema, which had almost disappeared in January, is now increasing.

The calorie levels recommended by the committee for civilian workers other than miners have never been met, much less their full energy needs. Industrial production has therefore been unsatisfactory. The ration cuts have made the position much more serious, and will cause increased absenteeism and discontent, and hinder German recovery. The committee had recommended that miners should have 3400 calories daily, and before the cut they were getting about that in the British and French zones. The effect on production was good, but now miners in the Ruhr are losing weight, production has fallen, and absenteeism is increasing.

There is no direct evidence that pregnant and lactating women are suffering extensively, but a woman who cannot supplement a ration of 1400–1700 calories by at least another 1000 cannot meet the physiological needs of herself and her child. Last November the committee recommended a uniform ration of 2350 calories in hospitals, and this has been achieved in the American and British zones, but not in the French. Some institutions, including asylums, are not classified by the Germans as hospitals and in these, where the basic ration is not supplemented, patients are already starving.

Displaced persons not engaged in active work have been recommended a ration of 2200 calories, but their diet has not been generally reduced to this level, it seems, and there is no significant malnutrition among them. They are considerably heavier than German adults.

CONCLUSIONS AND RECOMMENDATIONS

The committee conclude that the general situation is alarming. With rations at their present level it is hard to say when more serious effects will become obvious because much depends on the supplies of supplementary foods, mainly potatoes, still available; these have saved the situation in the past six months. If further drastic cuts have to be enforced, owing to the expected fall in grain stocks, a catastrophe may follow. The greater part of the population in the large towns are facing disaster which may seriously retard the recovery of Western Europe and disturb its political development. At the time of publication of this report further cuts seemed inevitable, and it was concluded that the attempt to maintain a uniform state of health in the German population would have to be abandoned. The committee recommended that every effort should be made to meet the ration scales in the accompanying table.

They suggest that, since a uniform standard of health cannot be maintained, some sections of the population should receive priority, despite the fact that some parts of the population will have to suffer more in consequence.

Every effort should be made to extend the number and range of weighings in the three zones, and this work should be correlated with that of nutrition survey teams, so that a true rise in body-weight will be distinguished from that due to hunger œdema. They also proposed that they should review the position again at the end of ninety days, or earlier if there seemed to be need for it.

PROPOSED RATION SCALES

Ration category	*Calorie value*	*Milk ration (litres)*
0– 3	1000	3/4 whole
3– 6	1200	1/2 whole
6–10	1550	1/2 whole or skimmed
10–18	1750*	1/4 whole or skimmed
Normal consumer	1550†	0
Pregnant and lactating women	2200*	1/2 whole
Moderately heavy worker	2000	0
Heavy worker	2500	0
Very heavy worker	3000	0
Underground miners	3400	0
Hospital patients	2350	0
Displaced persons (normal consumer)	2000	0

* These are lower than levels formerly recommended, and are enforced by the current situation.

† Recommendation of 1550 calories daily for the normal consumer assumes that some supplementary food will be available. Those who, through segregation, cannot be expected to receive such supplementary food should receive an appropriately higher ration.

ROYAL SOCIETY EMPIRE SCIENTIFIC CONFERENCE

At the morning session of the conference in Cambridge on June 28, with Prof. C. E. HERCUS (New Zealand) in the chair, a discussion on the

Ætiology and Control of Infectious and Transmissible Diseases

was opened by Dr. F. M. BURNET, F.R.S. (Melbourne), who urged that more consideration should be given to the spread of infections from endemic areas. A detailed study of each case was preferable to arguing from analogy. From the ætiological aspect organisms were divided into two main groups—the parasite or commensal on the human being, and organisms surviving in a living environment distinct from man. There was also an intermediate group. Every infectious disease was complex and one of the pressing problems was to predict the spread of each one. This was difficult often because of unpredictable factors. Prediction was relatively easy, for example, in typhoid but not with the common cold. There was a real danger of the introduction of non-endemic diseases into Australia. Its environment was suitable for yellow fever, and a mosquito-borne encephalitis (X disease) had already made a transient appearance there. Human action in Africa had assisted the spread of anopheles mosquitoes by attempts at control. The widespread introduction of budgerigars into the U.S.A. had increased the incidence of psittacosis there. Sudden increases in virulence in organisms were often unpredictable. Virulent mutations were common in diphtheria and influenza. A virulent variant of poliomyelitis virus in Australia in 1937 apparently arose in a single schoolroom. The study of microgenetics illustrated the difficulty in predicting these mutations. Epidemics in the future would probably be air-borne. Epidemiological control was divided into three main parts: prevention by quarantine; more scientific control of agriculture and drainage; and further chemotherapeutic advances. Finally Dr. Burnet reiterated his opening remark that generalisations in infectious diseases were unsatisfactory; detailed study was the answer.

CONTROL OF INSECT-BORNE DISEASES

Dr. G. M. FINDLAY pointed to the great reduction in the incidence of insect-borne diseases in the Armed Forces during World War II. We could approach the subject in three ways: (1) there is no danger of spread; (2) there is some danger but our organisation is perfect; (3) there is some danger and further work requires doing because of the imperfect organisation at present obtainable. Some organisation, such as UNO, should take charge. *Aëdes ægypti*, the vector of yellow fever, had spread from the Old to the New World before 1647 and today was being spread by more rapid means of transport. Similarly, malaria was transmitted to North America from West Africa by the slave-trade after the time of Columbus, and more recently the danger of carriage by planes had evoked legislation by the Brazilian government. Transmission had been simplified by the advent of the aeroplane. With yellow fever two factors had to be considered—the infected person and the vector carried in the plane. For the first we had yellow-fever immunisation, but here we were up against the multiplicity of yellow-fever certificates. There were seven types valid in England at the present time, lending themselves to forgery. There was a black market in forged certificates in Paris. International standardisation of the method of inoculation was required. To prevent the carriage of mosquitoes by plane necessitated sanitary control of aerodromes, which generally entailed considerable drainage schemes. Planes could be disinfested by the use of freon bombs, D.D.T., or similar compounds. As far as he knew no aircraft designers were incorporating any method of disinfestation in their new models. The present system was chaotic, and a resolution should be passed to the effect that an international organisation be established under UNO to control such methods as disinfestation of planes, sanitary control of aerodromes, and protective inoculations.

CHEMOTHERAPY, WITH SPECIAL REFERENCE TO MALARIA

Brigadier HAMILTON FAIRLEY, F.R.S., said that in the south-west Pacific campaign the efficacy of prophylactic mepacrine was shown by the low transmission-rate of malaria on return. Malignant tertian malaria was almost 100% prevented. 'Paludrine' was a true prophylactic in M.T. malaria since it destroyed the organism before the asexual parasites appeared in the blood, thus contrasting with such drugs as quinine and mepacrine. Paludrine was also a good schizonticide, and its action on the carrier caused some change in the gametocyte not demonstrable morphologically but which prevented the maturation of the oöcyst in the mosquito. The drug could be used in small doses at long intervals for organised mass prophylaxis in native villages. A possible loss of pre-immunity would have to be considered in such a long-term policy.

Prof. B. G. MAEGRAITH said that the ideal antimalarial drug should be non-toxic in both therapeutic and prophylactic doses. Therapeutically paludrine was non-toxic, for as much as 1.5 grammes daily for twenty days had been taken with only occasional abdominal pain and vomiting. Prophylactically, non-toxicity had not been established. For this there should be further trials and investigations. The mepacrine investigations were simplified by the organisations present during the war. The great difficulty now was in obtaining volunteers; but a glance at the morning paper with its reference to the capture of George Jackson had suggested to him the possibility of convict volunteers, following the precedent set by the U.S.A.

SANDFLY-TRANSMITTED DISEASES

Prof. S. ADLER (Palestine) pointed out that in contrast to the mosquito-transmitted diseases those due to sandflies showed a very limited distribution, in spite of favourable habitats in other countries. There had been no Old to New World transmission nor vice versa. The species in each case were quite distinct and typical. Air travel had produced excellent opportunities for vector transmission—for example, kala-azar to a country such as Australia. This did not apply to affected persons as the vector was absent. Dr. Adler made a special point of the extension of *Bartonella bacilliformis* to Colombia. The moot point was whether or not the Old World sandflies could be used as vectors for that organism. Experiments should be carried out in a non-endemic area such as England to determine this possibility.

SPREAD OF CHOLERA

Sir JOHN TAYLOR recalled that in previous times cholera had been spread all over the world, but now it was confined to the two main endemic areas—namely, Bengal Province and the Yangtse valley. In cholera there was no true carrier state. Spread was by human case and contamination of sewage and water. In this respect the regulation concerning the inoculation, before repatriation, of West African troops stationed in India was futile. In the average case no vibrios could be isolated after about five days from the cessation of symptoms. Contact carriers might be as high as 20%, but these cleared themselves of organisms fairly rapidly. The vibrio would survive in water for about 16 days. In spite of all that was known about the spread, there was still some unknown factor about cholera endemicity which demanded further investigation. It would require international coöperation to eliminate cholera from the Yangtse valley.

PLAGUE

Colonel Sir S. S. **Sokhey** remarked that under modern conditions of housing and living plague showed a changed status as a world pandemic. The pandemic in the 14th century, which lasted 200 years, caused 12,000,000 deaths in its first two years. In the last pandemic of 1894, commencing in China, the mortality was lower, owing to increase in prosperity and better living conditions. Good housing was the best prophylactic. The problem which always confronted us was why an epidemic started and why it ended. Infection generally started in a given area as an epizoötic spread and was closely related to the rat's susceptibility to plague organisms. For example, in the Bombay area in 1932, of approximately 1,000,000 rats examined 9% showed susceptibility; in 1933 7% showed susceptibility; and in 1936 there was no susceptibility. Since then there had been no epizoötic spread, but susceptibility had increased to 15%. In the Bombay area there were two small epizoötic reservoirs of infection, which could be mapped out exactly, and from these infection spread to other areas by boats, grain ships, &c. There were organisations which attended to these endemic areas and attempted to eliminate infection. As far as he knew, there was no endemic silvatic plague in the Bombay area.

ANIMAL DISEASES

Mr. R. **Daubney** saw a danger of rabies being introduced into this country because of the disregard of quarantine regulations. He cited an example of an officer returning from Africa with a dog which later developed rabies, with fortunately no human mortality, but 14 people were put to the inconvenience of anti-rabies inoculation. He also cited instances of the vectors of rickettsial disease failing to transmit infection, but later proved to be efficient vectors. There were apparently other factors, apart from the known ones concerned in the transmission of diseases—e.g., *Typanasoma vivax* was present in Mauritius in the absence of the tsetse fly. The tsetse fly was attracted to trains, planes, and any moving body, and in a period of three months nearly 4000 tsetse flies were removed from trains passing from one endemic to a non-endemic area.

Dr. J. **Du Toit** emphasised the close relationship between medical and veterinary science, and cited numerous instances of counterparts between animal and human diseases—e.g., in the U.S.A. when an attempt was made to eradicate tuberculosis 4,000,000 infected cattle were killed. In South Africa anthrax was once a serious and common disease among humans. Now, after the compulsory vaccination of sheep and cattle, this area had been cleared, and there had been no deaths from this cause during the past two years. Similarly, sleeping sickness in animals and human beings was identical, and, contrary to our accepted ideas, this disease can be transmitted by many species of the tsetse fly. He called for close coöperation and mutual assistance between the veterinary and medical services.

REGULATIONS

Major-General Sir **Alexander Biggam** pointed out the variations in protective inoculation regulations, both internationally and in the same country. This was most definite in reference to smallpox vaccination. He suggested a recommendation calling for uniformity in health certificates for prophylactic inoculation for passengers travelling to or from endemic areas.

Brigadier J. S. K. **Boyd** discussed the legislation from the point of view of the passenger, and emphasised that we should ensure that there be as little inconvenien as possible, consistent with adequate protection. I pointed to the futility of the anticholera inoculati of West African troops returning home after servi in India, and suggested that a resolution be passed th such a procedure was unnecessary. Further work w required to find more exactly the conditions necessary f vector transmission of diseases. It was not clea understood why *Anopheles gambiæ* should have recent spread from the Sudan to the Middle East. This h been blamed on the British Army, but he could not s why, through countless centuries, they could not ha been spread by the Nile traffic. There were two ma points in present legislation—the protection of the publ and the protection of the legislator. We required little more of the former and a little less of the latte

ENTOMOLOGY

Dr. E. H. **Cluver** said that insect-borne diseases we a major threat to southern Africa, and the problem shou be tackled by entomologists. This was almost impossib at present as trained medical entomologists were ve few. Only against the three main insect-borne diseas could we inoculate—plague, typhus, and yellow feve Preventive inoculation at its best could only l an interim measure. The opening of the new gol mining area in South Africa provided a further serio problem in the possibility of introduction of the arthropod-borne diseases. There was need for intensi entomological study, and for this a good team of medic entomologists was required.

DISCUSSION

Professor **Adler** said that there should never be a hesitation in forfeiting pre-immunity, by treating population in hyperimmune areas. An epidemic shou always be treated as it arose, and the fear of produci resistant strains of disease organisms was not warrante For instance, sexual multiplication of the parasite general produced a loss of the required resistance to chem therapy.

Dr. **Du Toit**, however, pointed out that arsenic ha been used as one of the chief agents for killing ticks, an it had now been shown that the most susceptible tick h developed an arsenic-resistant strain.

Dr. D. M. **Blair** (Southern Rhodesia) said that t spraying of planes was so badly done that it was bett not done at all. There was no uniformity of procedur the man on the job was very seldom provided wit the proper instructions, and it was left to the commo sense of the operator. International sanitary conventio were being misused for purely political reasons. H cited the case of a shipping company enforcing t letter of the law in prophylactic inoculations instead using common sense. It would be of value to have uniform international certificate for use on any rout and by any means of progression.

Dr. **Findlay**, at the request of Professor Hercus, re peated his suggested resolution that an international orga isation should be established under **Uno** to contr vaccination, disinfestation of aeroplanes, and sanitar control of all aerodromes.

Dr. F. **McLagan** (Sierra Leone) pointed to t lack of trained sanitary inspectors and suggested th more should be trained for this very important positio in the tropics.

Dr. **Burnet** said it was obvious that the ætiologic approach was very important, and it had shown the gre complexity and lability of pathogens and vector Drug-resistant strains could be expected when a lar proportion of the pathogen population was being treate This was shown with gonorrhœa and the sulphonamide and the large-scale daily sulphonamide prophylax against streptococci in U.S.A. Therefore, in malari we might expect drug-resistant strains to arise when a effort was made to deal with the whole of the nati population. Finally, if we applied modern methods o treatment to the overcrowded peoples of the tropic we must expect to have to deal with a populatio increase, producing a concomitant inadequate nutrition

Professor **Hercus**, summing up, said that the futur called for a more concentrated coördinated plan of effort as we could not afford to waste man-power. A definit strategy in research was necessary, and it was by this means we could go forward on a plan of definite action.

In England Now

A Running Commentary by Peripatetic Correspondents

When a Dutch friend asked me about our approved schools, I told her what little I knew, adding smugly that three-quarters of the children sent there became good citizens. "But what about the other quarter?" she wanted to know; and I had to admit that with these the approved schools failed. "That is because you do not look after them early enough," she said; and she began to tell me about a club at The Hague.

Housed in an old large school, rather shabby to look at ("If it looks too grand they will not come"), the Sparrows Club opens at five o'clock every day. It was started many years ago as a club for the very poorest children, those who live in the worst slums, and whose parents are often problems in their own right. Any boy or girl over the age of six can join, and every evening some twelve classes are running in the club. Children can attend any classes they please—a different one every night if they like—learning carpentry, painting, metalwork, acting plays they have written themselves, or finding out how to make music. If they don't feel like learning anything they can go to the destruction class and break things up—old beds, chairs, ironmongery, and other derelict household equipment, the component parts of which are stacked and sold as firewood and scrap-iron, the money going into the club funds. Children in other classes make toys or furniture, and these are exhibited and sold at monthly sales. A child is allowed to keep one out of every three toys he makes, so that he is contributing something to the commonwealth and also getting a just reward.

There are very few educated teachers in the club: nearly all the classes are taken by older boys, or by fathers and mothers who have joined out of interest in the doings of the children. In the games room, for example, chess is taught by a crossing-sweeper; and the leader of the club—a man of lovable and vigorous character—is himself a workman. During the slump years many unemployed men and women joined the club, and worked there. Dutch people receiving public assistance are required to report twice a day to a bureau, to prove they are not working and to get a card stamped. This unpopular regulation meant long hours of queueing for the workless; but the club, besides giving them something to do, arranged to stamp their cards for them—a great attraction. They could not be paid for the work they did, of course, but they were credited on a system of points, and were able to buy household goods at the monthly sales, to the value of the points they had earned.

The club has a membership of about 1200, and room to receive about half that number on any given night. Its chief aim is to train the characters of the children, to give them self-respect and self-confidence, and to keep them from becoming delinquent. In other words, it is an important piece of social and preventive medicine. "We tell them frankly what people say of them," my friend explained earnestly. "'They think you are no good,' we tell them, 'but it is not true, and you must show it is not true.'" The club is not interested in brains *as such*: leaders with brains can lead people astray. When new gangs of boys and girls come in, the club tries to break up the groups and to spread them among the others, who have already learned to give more weight to qualities of character than to glibness and facility. Boys and girls mix freely in the club, which they run themselves; they learn by work, and they enjoy the work because they take it as a game. In making their own designs for toys or furniture, and carrying them out, they develop their creative side, and since, in later years, most of them will have to struggle for themselves, they need the self-reliance which comes of devising something and carrying it through successfully.

The club runs summer camps, not only for the children but for its adult members, and for families who want to go camping together. The children save their pocket-money towards the cost of running the camps, which are very popular. Parents and children together write and circulate a club newspaper, and the boys run a football team which competes against teams from the police. "I explained this to some boys in one of your English clubs," she said, "but nobody laughed. Do not your boys then regard the police as enemies?" (I said she *should try Ireland.*)

The International Red Cross have just decided to give their support to the Sparrows—who have so far depended on their own exertions and on voluntary contributions. This means that new clubs of the kind will be opening elsewhere in Holland, and perhaps elsewhere in Europe. What about a few here?

* * *

Cheerfulness is a plant which flourishes in odd places, and I have learnt to go for refreshment in dark moments to the unlikely surroundings of a V.D. unit, patronised by some of the toughest specimens of the underworld. But the other day I found Sister rather downhearted. "I can't make up my mind, doctor," she explained, "about men and women, I mean. Which of the two is the worse. Half the time I say all men are brutes: the other half I want to start a Young Men's Protection Association." Clearly there was a story here and I pressed for details. "Well, you know that nasty little piece of peroxide in the side-ward with SY, GC, and a baby on the way? Would you believe it, as smart a young sergeant as you ever saw has come along and insists on marrying her. And he's not responsible for any of her troubles. He just thinks she's an angel who never had a chance to flap her wings!" I pointed out that chivalry was such a rare asset nowadays that perhaps it ought to be encouraged. The too-experienced lady shook her cap sadly. "No. The trouble is the poor boy's dreaming, and Heaven help them both when he wakes up!"

* * *

This morning we organised a real shoot for the wild pig that roams the forests here. Beaters, German forest men, were laid on for seven in the morning and we arrived about an hour late, having stopped for breakfast (wet) on the way. The chief beater, who took things very seriously—shades of Goering's hunting efforts—was dressed for the part in plumed hat and camouflage. He was very shocked when, instead of going on with the business, the colonel ordered the cellar to be brought from the car, and we settled down to another brief session.

Ultimately we staggered along to a corner of a dense forest while the beaters thrashed down towards us from the opposite side. I was expecting to be safe in a box, and was horrified to find myself faced with some exceedingly tall and fierce brutes (dangerous, I gather, if tickled), with only a rifle and my marksmanship between me and their long wicked tusks. We saw several, charging in all directions, but except for winging a beater they did no harm, thank goodness. I am sure I saw one boar with a waistcoat on, but I was told this was unlikely. On my advice (which he always takes) the C.O. ordered champagne afresh and we commemorated our efforts at this noble sport with another of our hepatic teasers, much to the disapproval of forest, boar, beaters, and all.

* * *

We have all got a volkswagen now, to help us in our mad career round the country. They are ingenious little things, with an engine in the back which can take you to most places at a steady chugging fifty or so. There's hot-air heating, and a selection of lights on the dashboard meaning various things, I'm not quite sure (as usual) what. If the thing won't start, again I'm not happy as to the proceedings, but gather that the best thing to do is either to get the central pin out and build the whole machine afresh at the side of the road, or post the chariot back to the makers, when a new one will be supplied stat—that is, if one has collected sufficient coupons from the outer wrappers of the "Make Your Colon Conga" laxative which is being used out here. Being on the wrong side of six feet and thirteen stone makes volkswagen travelling difficult. But, by inserting myself in the left occipitoposterior position, and rotating anteriorly when most of me is past the gearbox, I manage it. If I am carrying two passengers of similar proportions they must insert themselves as described, and the driver's breech must present through the window so as to allow at least two to breathe at a time. Actually it is a very comfortable little car, but I am not very happy about leaving it too long in the sun; one never knows what might happen if the glue melted.

Parliament

ON THE FLOOR OF THE HOUSE

It is a question whether we should not rename our sessions, and instead of calling them parliamentary days call them parliamentary nights. On Monday, June 24, the House of Commons began its discussion in committee on the Finance Bill at 3.33 P.M. and continued without a break until Tuesday, June 25, at "one minute to eleven o'clock A.M." as the Hansard report records. The House then began again with Tuesday's questions at 2.30 P.M. and continued without a break until 4.6 A.M. on Wednesday. The next two nights were relatively early—i.e., we finished about midnight.

But parliamentary days also continue, and the committee stage of the National Health Service Bill is now being taken at afternoon as well as morning sessions. Which means that some members are working almost round the clock. And with all this the rules of order and the ceremonial of Parliament—which is invaluable in keeping order—are maintained.

Though the National Health Service Bill has run into some stormy weather, Skipper Aneurin Bevan is determined to bring it to the report stage on the floor of the House early this month. Most of the clashes hitherto have been on well-defined differences of opinion between supporters and opponents. But the amendment moved by Mr. Hopkin Morris opened up a new field. Under the Bill it was proposed that any minor complaints by "potentially aggrieved persons" (to use the Minister's words) should be made to the local executive council with which the general practitioner was in contact. From this decision there was an appeal to a tribunal and thence to the Minister. Mr. Hopkin Morris argued that an appeal should be possible from the tribunal to the High Court. With the Communist support of Mr. Piratin, and the Labour support of Dr. Morgan and Dr. Clitherow, the Opposition defeated the Minister on a division. By the afternoon Mr. Bevan was admitting that the committee was tired, while others thought it had passed the "point of irritability." It is the general opinion that all the differences on this Bill are committee differences only, but as fatigue blurs judgment some of them have taken on the aspect of fundamental principles.

Government and Opposition conflict is generally sharpening, and the announcement of bread-rationing—which we are the last European country to adopt—has sharpened it further. MEDICUS, M.P.

THE HEALTH BILL IN COMMITTEE

On clause 41 Mr. H. LINSTEAD moved on June 26 the first of a series of amendments which gave the committee the opportunity of considering the optical services provided under the Bill.

OPHTHALMOLOGISTS AND OPTICIANS

According to the white-paper the aim was to provide an eye service as part of the hospital and specialist services in special departments and clinics, with sight-testing and dispensing opticians taking part under medical ophthalmologists. But till this scheme could come into operation there was to be a supplementary scheme making use of suitably qualified general practitioners and opticians. It seemed to him that the Minister's intentions stood or fell on the question of man-power. From the best inquiries he had been able to make we had at present 500 ophthalmologists recognised as specialists. Possibly there was the same number of general practitioners with some specialist knowledge of eye diseases. If it was assumed that ultimately the Minister would be able to provide 1000 first-class medical ophthalmologists there would then be roughly only 1 for every 45,000 of the population. Circumstances would compel the Minister to maintain his subsidiary scheme in operation for many years. We had, Mr. Linstead believed, something like 7000 opticians, but once the main scheme was developed perhaps only half of them would be required. How could the Minister expect any profession to develop with such a guillotine hanging over it?

Mr. SOMERVILLE HASTINGS thought that the Minister would be able to use fully the services of the opticians and the ophthalmic surgeons working together as a team. Till the complete scheme could begin he hoped that some of the service would be carried out at health centres. But as soon as the scheme was fully developed there should be only two types of worker—the ophthalmic optician and the ophthalmic surgeon, leaving out the general practitioner who could not be a real expert in this work.

Colonel M. STODDART-SCOTT suggested that if there was to be a well-staffed service the Minister should lay down educational standards and even provide for a register of ophthalmic opticians. Mr. A. BEVAN affirmed that he wanted to encourage good people to become opticians and to raise their professional attainments. Representatives of eye specialists and eye-testing opticians would meet at his invitation next week to discuss, he hoped in terms of cordial coöperation, the relative status of both sections. There would be refractionists in the large health centres. The eye specialist would be centred on the hospitals, but would move freely between the health centres and the hospitals. The only difficulty was the shortage of specialists, and therefore they would have, for a time, to make do with something less than the ideal. The amendment was withdrawn and the clause was ordered to stand part of the Bill.

DISQUALIFICATION OF DOCTORS

Mr. P. PIRATIN moved an amendment to clause 42 to make it obligatory on the tribunal to inquire into all cases, and not only on representations from the executive councils. If a complaint was recognised as serious, even though it had been turned down by the local body, the complainant should have a right to have his case heard by the tribunal. Mr. BEVAN said that the tribunal was an important body and he did not want it to be a source of petty persecution of the profession. If the tribunal were called upon to investigate allegations against doctors brought by any person at all, it would be a curious situation. He must resist the amendment. Minor allegations were to be sifted first of all by the local executive. The amendment was withdrawn.

RIGHT OF APPEAL

Mr. R. H. MORRIS moved an amendment removing the right of appeal to the Minister from a decision of the tribunal and substituting the right of appeal to the High Court. The Minister himself might be a party to the proceedings before the tribunal, and as the Bill now stood he was also the final court of appeal. Why should the doctor lose his right as a citizen to have his case judged by an independent court, especially when his professional reputation and livelihood were at stake?

Mr. H. WILLINK thought that from the point of view of difficult questions of evidence a tribunal, consisting of two lay members and a lawyer, was not an immensely strong body, yet it could direct that a man's name should be removed from the lists of one or all the executive councils. The General Medical Council had lately come in for considerable comment. The tendency of public opinion was that there ought to be resort to the courts in cases of this importance.

Mr. BEVAN intervened to prevent the committee from being stampeded by emotions aroused over a related but different subject. The G.M.C. procedure might or might not be altered, but it was not a matter for this Bill. They were not discussing whether a man had been guilty of unprofessional conduct, but whether a person who had contracted to carry out certain duties was carrying them out to the satisfaction of reasonable people. Since they were creating a service in which overwhelming numbers of doctors would participate he had decided that exceptional protection should be given to individual doctors against the possibility of injustice. He had not thought the existing machinery, by which the local committee considered the complaint and appeal was made to the Minister, to be adequate. He had therefore put another body between the local executive council and the Minister. For example, a complaint might be made against a doctor that he was continuously drunk. That complaint would be investigated in the first instance by a body on which the medical profession itself had half the representation, and the other half would be drawn partly from nominations by the Minister and partly from the local health authority. If that body said that the man ought to be removed from the list he could appeal to the tribunal with proper legal procedure, and if the tribunal upheld the first decision the doctor could still appeal to the Minister, which meant in effect to the House of Commons. The possibility of injustice being done after these three investigations was negligible. The suggestion that a judge of the High Court was a better person to decide whether a doctor had carried out his job properly than the executive of the profession or the tribunal or the lay Minister was just flat nonsense. Parliament imposed upon the Minister an obligation to provide a service. Under the amendment the courts would decide the instrument through which he would give the service. If the procedure of the Bill was not carried out, if the various tribunals exceeded their powers, the appellant could still go to court. But he could not admit that the courts should interpret whether the doctor had, in fact, been a good servant to the people. He was satisfied that the doctor would be better off under the Bill, because if an offence was committed in one area he would only be removed from that particular list. He could go elsewhere. Whereas if he went to the courts the case would be publicised throughout the country.

Mr. PIRATIN thought that if the Minister had given greater responsibility to the regional boards on the question of practitioners there might have been a case for the Minister to be the final judge. But the Minister was the employer and he was framing the whole scheme in a highly centralised way. Mr. LINSTEAD pointed out that the Minister or the tribunals set up under the Bill would possess powers as comprehensive as the powers of the statutory professional disciplinary bodies. If a complaint came before the G.M.C. it could ultimately reach the High Court. If there were two channels of discipline they ought to be brought to a head at the same place. Mr. HASTINGS declared that to determine whether an individual was fit to remain a member of the National Health Service could not be the function of the High Court. As a member of the medical profession he felt that all those who would be employed in this very important service would have all they needed against any possibility of injustice or victimisation. But Mr. J. S. C. REID thought that the words "prejudicial to the efficiency" of the service were vague. Was it to be a factual investigation of a complaint or a policy investigation of the kind "Is this the right sort of man to have in the service?"?

The committee then proceeded to a division, and Mr. HOPKIN MORRIS's amendment to leave out the right of appeal to the Minister was carried by 19 votes to 17—the first defeat of the Government since the Bill went into committee. The part of the amendment substituting an appeal to the High Court for an appeal to the Minister was then negatived by 17 votes to 16, thus leaving no right of appeal in the Bill.

On resuming the session in the afternoon the CHAIRMAN suggested that nothing further should be done with the clause, but that the Minister and those who disagreed with him should submit new clauses on report stage. Mr. BEVAN, however, saw no reason why the clause should not be passed as it was and promised that he would consider later what steps should be taken to remedy the unfortunate consequence of the pyrrhic victory of the morning; for, he pointed out, as the clause was now amended, there was no appeal at all. It was proposed, he added, to provide by regulation for evidence to be taken on oath and for legal representation, and for other forms of discipline, besides removal from the list, to be imposed by the executive councils and the tribunals for minor offences. The clause as amended and clause 43 were then passed.

CHARGES FOR DENTAL TREATMENT

Subsection 1 of clause 44 deals with the recovery of payment for appliances more expensive than the prescribed ones, and Mr. HOPKIN MORRIS moved an amendment extending this provision to dental treatment. Captain J. BAIRD described the amendment, which he opposed, as the main issue of the Bill for dentists. Even as the Bill stood he believed that there was a class distinction which would allow wealthy or middle-class patients to buy appointments with a dentist in time of scarcity. Commander T. D. GALBRAITH pointed out that while the shortage of dentists existed those who could obtain full-time private practice would not come into the scheme unless offered some inducement.

Mr. BEVAN said he had met the representatives of the dental profession, and while he would not go so far as to say that they wholeheartedly and enthusiastically accepted his interpretation of what was intended he did not discern any hostility in their reaction. If he accepted the amendment everyone would think the Government had gone crazy. Where a more expensive form of treatment was necessary for the health of the patient it should be given, and he was prepared to discuss with the profession what regulation could be made to that end. But he was not prepared to accept a subvention for unnecessarily expensive treatment because it might be profitable to the dentist. The amendment was withdrawn. Mr. HASTINGS registered his objection to the clause because it admitted two types of treatment. Mr. BEVAN did not dispute this risk, which he admitted was a continuing danger in the service; but surely it was a weakness not in the scheme but in mankind and in social reality. If the State were to provide everything free the whole scheme would break down. While he admitted a State service might thus appear stodgy and cheap it did universalise appliances and treatment which would otherwise be inaccessible. The State must try progressively to improve the standards which it made freely available. Clauses 44 and 45 were passed.

RENT FOR SURGERIES

Mr. PIRATIN moved an amendment that charges should not be exacted from practitioners who used the health centres. He thought a preferable arrangement would be to pay a fee to doctors who had not access to health centres. Mr. BEVAN said that a doctor's remuneration took into account his professional expenses, including the provision of a surgery. When the doctor was given a consulting-room at a health centre it was therefore reasonable that he should pay for it. Mr. Bevan was anxious to encourage doctors to practise at health centres, and the rents charged would not be such as to discourage them from settling there. The doctor's wife would probably be a great help in inducing her husband to use the centre.

Provision of a health centre, Mr. Bevan pointed out, would not exempt general practitioners from domiciliary service and they would be expected to live within reasonable reach of the area they served. Doctors at a centre would no doubt be able to make arrangements for emergency calls, but the medical profession had itself emphasised the necessity of continuity of treatment by the same doctor for the same patient, and personal contact must be maintained. Clauses 46 and 47 were ordered to stand part of the Bill.

Sir HAROLD WEBBE moved an amendment to clause 48 providing that optical practitioners, as well as dental and medical, should have refresher courses, and Mr. HASTINGS put in a word for all other health workers, including nurses. Mr. BEVAN said if the language of the Bill did not already give him power to provide such courses it would certainly be amended, and the clause was ordered to stand part of the Bill.

ACCOMMODATION FOR MENTAL PATIENTS

When the committee resumed on June 27, clause 49, transferring to the Minister certain functions of the Board of Control, was passed with drafting amendments. Mr. C. W. KEY moved an amendment to clause 50 enabling the Minister as a temporary measure to include in the designation "mental hospital" a small poor-law institution, or wards in such an institution, where only mental patients are accommodated. These patients would then come under the care of the medical and nursing staff of the neighbouring mental hospital. The hospital management committee would be responsible for their maintenance, and the poor-law authorities would cease to have any statutory duties to these patients, though they would have to remain in their present institution till there was adequate accommodation for them in a proper mental hospital.

Mr. Key also moved an amendment removing from the clause words which would unnecessarily restrict the Minister's power to transfer a mental patient to an institution nearer his home because it happened to be in another region. Both these amendments were passed and clause 50 was ordered to stand part of the Bill, as were clauses 51 and 52.

PAYMENT OF GRANTS

Mr. Key said that it was hoped to get the Bill amending the block grant system to local authorities into operation before the National Health Service Bill itself came into operation. Clause 53 was passed.

On clause 54 Sir HUGH LUCAS-TOOTH asked whether the regional board would have to submit detailed budgets. Would they be allowed to carry any surplus forward at the end of a year? Mr. KEY thought that grant was the wrong word to use. The Minister had to provide the whole funds of the regional boards and of the hospital management committees, and must therefore be answerable for the sums allotted. The management committee would submit to the regional board an estimate of its expected expenditure so that the board, as instrument of the Minister, should have an idea of the character of the service to be carried out. From the information received from the committees, the board would know what money was needed for its area, and it would be able to negotiate with the committees. The board's contemplated expenditure would then be submitted to the Minister, who would consider it in view of the expenses of the service as a whole. But within the limits of the sum approved, the boards and committees would have considerable latitude. Obviously, any deficit would have to be made good at the end of the year and any surplus carried through to the next budget. Endowment moneys were entirely outside these budgets and would not influence allocations. Clauses 55 and 56 were passed.

MINISTER'S POWERS OF DEFAULT

On clause 57 Mr. REID moved an amendment seeking to exempt the Medical Practices Committee and the Dental Estimates Board from the Minister's power to supersede bodies which did not behave. They were bodies of some independence and, though appointed by the Minister, were not his agents in the same sense as an administrative body such as a regional board. Mr. BEVAN said it was impossible to impose responsibility on the Minister to provide a service and then create an independent body in the service who could refuse to carry it out. Only in most exceptional cases need these powers of default be exercised. After what Mr. Bevan termed "a torrent of synthetic indignation" from the Opposition, the amendment was turned down and the clause was accepted.

ACQUISITION OF LAND

Mr. KEY moved amendments, which were passed, making applicable to the authorities under the Bill powers for the compulsory acquisition of land contained in the 1946 Act. On the question that the clause stand part of the Bill, Mr. WILLINK pointed out that for many years to come the Minister would be hungry for hospital accommodation, but "any land" meant land with buildings and consequently the Minister would have power to acquire any small hospital or nursing-home set up under private initiative for special work. He asked for an assurance that the Minister had no desire for a complete monopolistic set-up with regard to the institutional treatment of the sick. Mr. BEVAN admitted that in an emergency it might be necessary for the welfare of the people that accommodation should be taken over, but disavowed any intention that the National Health Service should become "a huge monopolistic tree in the shade of which nothing else would grow." No Minister of Health with a health service worth defending would try to prevent the growth of forms of therapy which might establish themselves. He believed that anybody could go on experimenting without the fear that the Minister of Health would pounce upon his buildings and apparatus. The clause was ordered to stand part of the Bill.

GIFTS TO HOSPITAL MANAGEMENT COMMITTEES

Mr. WILLINK moved an amendment to clause 59 including hospital management committees among those who should have power "to accept, hold and administer any property upon trust for services connected with hospital services." Mr. HASTINGS saw grave danger in the amendment, through which another voluntary-hospital system might grow up. He feared that some committees might neglect their administrative duties to collect money which would make them to a large extent independent of the Minister.

Mr. BEVAN said that if the amendment was accepted it would not destroy the scheme, for the hospital management committees were already sharers in the endowments. In the day-to-day administration of the hospital system the management committee was more important than the regional board. If the scheme was to succeed the committee was the body which would "warm up" the whole administration. Because he recognised the danger that uniform regulations would destroy the spontaneity of the administration, he had not taken hospital endowments into the Exchequer, but if that money were to remain at regional level it would not fructify. Research, for instance, he hoped would be done by the health service itself in the teaching and other hospitals, and the boards would not really have much to do with it. But Mr. Hastings had put his finger on a danger. We did not want the hospital management committees to become such autonomous bodies as once more to atomise the whole structure. As Lord Moran has pointed out, one of the merits of the scheme was to bring the universities' influence right down to the local hospital. At present certain specialists—the prima-donnas of the operating-theatre—were identified with certain hospitals not wholly on professional grounds but partly, at least, for their ability to charm money out of those who possessed it. Still, Mr. Bevan thought that it should be possible for the hospital management committees to accept gifts, but he did hope they would not start begging in the old way. He was prepared to make some amendments to the scheme and he suggested that Mr. Willink should withdraw his amendment on the understanding that on the report stage this would be included along with other alterations. The amendment was accordingly withdrawn.

INTERIM FINANCES

Mr. D. L. LIPSON was anxious that the Minister should make a public appeal emphasising the present need of the hospitals till the State actually took them over, and making clear that the endowments would only be taken over once, and that gifts made after the scheme came into operation could be retained. Indeed, could not gifts made in the interim period also be retained?

Mr. BEVAN pointed out that the hospitals were getting into financial difficulties even before the Bill was brought forward, but he agreed we should try to keep the hospitals up to the highest possible standard. The estimate as to what the hospital endowments would be was pure guesswork. It would take some time to disentangle the subterranean assets which hospitals concealed while running overdrafts into which they hoped to suck charitable endowments. He could not therefore promise that until the vesting date contributions made to hospitals should remain there, for he did not know what the situation was. He reassured Mr. Hastings that he would not consider giving the house committees of the individual hospitals power to accept gifts and hold property, but only the hospital management committees. Clauses 59, 60, and 61 were accepted.

SALARY OF THE M.O.H.

On resuming the discussion of clause 62 Mr. LIPSON asked if it was necessary for the Minister to take power to fix the salaries of officers, not only of the regional boards and executive councils but also of the local authorities. Mr. LINSTEAD, speaking as vice-chairman of the joint negotiation committee of the hospitals staffs, welcomed the Minister's intervention. Mr. BEVAN said he must resist the amendment, for it would disappoint many health workers. Where machinery for negotiation existed it was intended to use it, and where it did not exist to create new machinery on which the local authorities would be represented. It was surely undesirable that health workers performing the same work should be paid differently in different parts of the country. Moreover, they wished in the new proposals to give opportunity for easy transfer with superannuation benefits from a local health service to the National Health Service and vice versa. The amendment was negatived and the clause ordered to stand part of the Bill. Clauses 63 to 68 were also agreed to.

REGULATIONS AND ORDERS

When the committee met on July 2, Mr. BEVAN said he was inclined to adhere to the arrangements laid down in the Bill for affirmative resolutions, orders, and regulations.

Mr. WILLINK, moving that the distribution of endowment funds should be the subject of parliamentary resolution, suggested that the structure of clause 69 was surprising: an affirmative resolution by Parliament was required only for questions of superannuation and transfer and compensation. He thought that the proposed system of control was unsatisfactory in three respects. First, an explanation of the redistribution of hospital endowments should be incorporated in the Bill. (Mr. BEVAN intervened to point out that qualitatively the distribution had already been decided by the House and by the committee; and the House of Commons would not like to be mixed up with the local issues involved in its quantitative distribution. Mr. WILLINK replied that the Minister should take the initiative and explain now rather than wait for prayers to Parliament from particular areas.) Secondly, the constitution of regions should be brought into the scope of affirmative resolutions; there was still uncertainty about the number and extent of regions, and there should be a debate to decide whether the Minister's decision on this important and still obscure issue was the best. Thirdly, there should be some control to meet the case of defaulting hospital boards, management committees, and local authorities.

Sir HUGH LUCAS-TOOTH said that if the Minister would go some way towards meeting these suggestions, parliamentary time would be saved. However money was distributed under the Hospital Endowment Fund, representations would be made to Members. Would it not be better if the Minister were to tell the House what he intended to do and give his reasons? Constituents felt that the constitution of the regional boards was one of the most important single items in the Bill, and the House of Commons should be given an opportunity for discussion.

Mr. BEVAN said he would see whether wording could be included to permit discussion of the constitution of regional areas. He reiterated that discussion of the distribution of endowment funds should be kept off the floor of the House as much as possible. The global figure would be the same whatever the regional distribution: it should be a matter for objective discrimination by civil servants. Mr. WILLINK's motion was negatived.

Mr. BEVAN moved an amendment to ensure that variation of the Central Health Services Council by order should be subject to negative resolution by Parliament. This was carried, and the amended clause was ordered to stand part of the Bill. Clauses 70 and 71 were also ordered to stand.

WINDING UP OF BODIES

Under clause 72, Mr. BEVAN moved an amendment that where bodies were to be wound up on the appointed day, rights and liabilities of these bodies under any arrangements for payment of superannuation benefits in respect of officers who had ceased to be employed before the appointed day should be transferred to the local authorities by which the bodies were appointed, or, in the case of joint committees or joint boards, be apportioned among the constituent authorities. The amendment was carried, and the clause was ordered to stand part of the Bill.

Proposed New Clauses

Mr. KEY moved a new clause dealing with the provision in all hospitals of educational facilities, which were to be arranged by the local education authority or voluntary organisation at whose disposal facilities would be placed by regional boards or hospital committees. It was agreed to incorporate this clause in the Bill.

Mr. KEY moved a clause to exempt from stamp-duty drafts, orders, or receipts given by or to an executive council for money payable in pursuance of the Act, or an agreement by any person with an executive council for services under part 4 of the Act, or any document in connexion with the transfer of property or liabilities from an insurance committee to an executive council. The committee agreed to adopt this clause.

Mr. KEY moved a clause empowering local authorities to buy and store goods for regional hospital boards, boards of governors of teaching hospitals, hospital management committees, or executive councils. This would facilitate central distribution, in which, he said, there were obvious advantages. It was agreed that the clause should be included.

INDUSTRIAL MEDICAL SERVICE

Mr. PEARSON moved a clause calling on the Minister to frame within five years of the appointed day a scheme for an industrial health service. Mr. BEVAN said that the industrial medical service would in time fall into line: he hoped that before the end of the present Parliament the future industrial service would be seen more clearly. Dr. H. B. MORGAN said that there was need for more research and for better education of medical students in industrial medicine. Mr. V. J. COLLINS said that part-time factory doctors, who got industrial appointments only because they had purchased practices, were ignorant of the work; there was need for more experienced men in industrial medicine. Mr. BEVAN pointed out that research was already proceeding, and that under the Bill treatment for industrial diseases would be provided, though not actually in factories. Colonel STODDART-SCOTT said that if any service should be nationalised, it was that of industrial medicine. The clause was withdrawn.

Mr. PEARSON moved a clause to enable local health authorities to delegate administration of services to local authorities. He said that he had in mind the case of the large urban district councils and the metropolitan boroughs. Mr. BEVAN replied that this would destroy the unity of the service: delegation, he suggested, caused confusion. Mr. LIPSON called for delegation of authority in the name of the efficient non-county boroughs. There was a strong argument for spreading responsibility, which alone would keep alive local government as it was now known. The clause was rejected by 21 votes to 12, and the committee adjourned until the afternoon.

FROM THE PRESS GALLERY

Rationing of Bread and Flour

On June 27 Mr. JOHN STRACHEY, Minister of Food, announced in the House of Commons that bread and flour will be rationed from July 21. The Government, he said, have only reached this decision because they are convinced that to fail to ration bread and flour at the present time would be to take an unjustifiable risk with the basic foodstuff of the British people. They are determined that every family in this country shall be sure of its share of bread and that that share shall be, so far as humanly possible, adequate to the individual needs of its members. The scheme will cover bread, flour, and flour confectionery. In ounces of bread per day the rations for different groups will be as follows

Children—	
Under 1	2 oz.
From 1 to 5	4 oz.
From 5 to 11	8 oz.
From 11 to 18	12 oz.
Expectant mothers and women manual workers	11 oz.
Men manual workers	15 oz.
All other adults	9 oz.

The workers who will receive the higher scales will number some 12 million. The statutory scale of provisions for seamen will be adhered to.

The housewife will be free to take any part or all her ration in flour or flour confectionery instead of bread and to shop wherever she pleases. The ration will be measured in bread units. A 1 lb. 12 oz. loaf will cost 4 bread units, 1 lb. of flour 3 bread units, and 1 lb. of flour confectionery 2 bread units.

Allowances to catering establishments and institutions will be similarly restricted but the supply of bread and flour will be safeguarded for the "meal-on-the-job" scheme, whether in the form of industrial canteens or till there was adequate accommodation for them in a proper mental hospital.

Mr. Key also moved an amendment removing from the clause words which would unnecessarily restrict the Minister's power to transfer a mental patient to an institution nearer his home because it happened to be in another region. Both these amendments were passed and clause 50 was ordered to stand part of the Bill, as were clauses 51 and 52.

PAYMENT OF GRANTS

Mr. Key said that it was hoped to get the Bill amending the block grant system to local authorities into operation before the National Health Service Bill itself came into operation. Clause 53 was passed.

On clause 54 Sir HUGH LUCAS-TOOTH asked whether the regional board would have to submit detailed budgets. Would they be allowed to carry any surplus forward at the end of a year? Mr. KEY thought that grant was the wrong word to use. The Minister had to provide the whole funds of the regional boards and of the hospital management committees, and must therefore be answerable for the sums allotted. The management committee would submit to the regional board an estimate of its expected expenditure so that the board, as instrument of the Minister, should have an idea of the character of the service to be carried out. From the information received from the committees, the board would know what money was needed for its area, and it would be able to negotiate with the committees. The board's contemplated expenditure would then be submitted to the Minister, who would consider it in view of the expenses of the service as a whole. But within the limits of the sum approved, the boards and committees would have considerable latitude. Obviously, any deficit would have to be made good at the end of the year and any surplus carried through to the next budget. Endowment moneys were entirely outside these budgets and would not influence allocations. Clauses 55 and 56 were passed.

MINISTER'S POWERS OF DEFAULT

On clause 57 Mr. REID moved an amendment seeking to exempt the Medical Practices Committee and the Dental Estimates Board from the Minister's power to supersede bodies which did not behave. They were bodies of some independence and, though appointed by the Minister, were not his agents in the same sense as an administrative body such as a regional board. Mr. BEVAN said it was impossible to impose responsibility on the Minister to provide a service and then create an independent body in the service who could refuse to carry it out. Only in most exceptional cases need these powers of default be exercised. After what Mr. Bevan termed "a torrent of synthetic indignation" from the Opposition, the amendment was turned down and the clause was accepted.

ACQUISITION OF LAND

Mr. KEY moved amendments, which were passed, making applicable to the authorities under the Bill powers for the compulsory acquisition of land contained in the 1946 Act. On the question that the clause stand part of the Bill, Mr. WILLINK pointed out that for many years to come the Minister would be hungry for hospital accommodation, but "any land" meant land with buildings and consequently the Minister would have power to acquire any small hospital or nursing-home set up under private initiative for special work. He asked for an assurance that the Minister had no desire for a complete monopolistic set-up with regard to the institutional treatment of the sick. Mr. BEVAN admitted that in an emergency it might be necessary for the welfare of the people that accommodation should be taken over, but disavowed any intention that the National Health Service should become "a huge monopolistic tree in the shade of which nothing else would grow." No Minister of Health with a health service worth defending would try to prevent the growth of forms of therapy which might establish themselves. He believed that anybody could go on experimenting without the fear that the Minister of Health would pounce upon his buildings and apparatus. The clause was ordered to stand part of the Bill.

GIFTS TO HOSPITAL MANAGEMENT COMMITTEES

Mr. WILLINK moved an amendment to clause 59 including hospital management committees among those who should have power "to accept, hold and administer any property upon trust for services connected with hospital services." Mr. HASTINGS saw grave danger in the amendment, through which another voluntary-hospital system might grow up. He feared that some committees might neglect their administrative duties to collect money which would make them to a large extent independent of the Minister.

Mr. BEVAN said that if the amendment was accepted it would not destroy the scheme, for the hospital management committees were already sharers in the endowments. In the day-to-day administration of the hospital system the management committee was more important than the regional board. If the scheme was to succeed the committee was the body which would "warm up" the whole administration. Because he recognised the danger that uniform regulations would destroy the spontaneity of the administration, he had not taken hospital endowments into the Exchequer, but if that money were to remain at regional level it would not fructify. Research, for instance, he hoped would be done by the health service itself in the teaching and other hospitals, and the boards would not really have much to do with it. But Mr. Hastings had put his finger on a danger. We did not want the hospital management committees to become such autonomous bodies as once more to atomise the whole structure. As Lord Moran has pointed out, one of the merits of the scheme was to bring the universities' influence right down to the local hospital. At present certain specialists—the prima-donnas of the operating-theatre—were identified with certain hospitals not wholly on professional grounds but partly, at least, for their ability to charm money out of those who possessed it. Still, Mr. Bevan thought that it should be possible for the hospital management committees to accept gifts, but he did hope they would not start begging in the old way. He was prepared to make some amendments to the scheme and he suggested that Mr. Willink should withdraw his amendment on the understanding that on the report stage this would be included along with other alterations. The amendment was accordingly withdrawn.

INTERIM FINANCES

Mr. D. L. LIPSON was anxious that the Minister should make a public appeal emphasising the present need of the hospitals till the State actually took them over, and making clear that the endowments would only be taken over once, and that gifts made after the scheme came into operation could be retained. Indeed, could not gifts made in the interim period also be retained?

Mr. BEVAN pointed out that the hospitals were getting into financial difficulties even before the Bill was brought forward, but he agreed we should try to keep the hospitals up to the highest possible standard. The estimate as to what the hospital endowments would be was pure guesswork. It would take some time to disentangle the subterranean assets which hospitals concealed while running overdrafts into which they hoped to suck charitable endowments. He could not therefore promise that until the vesting date contributions made to hospitals should remain there, for he did not know what the situation was. He reassured Mr. Hastings that he would not consider giving the house committees of the individual hospitals power to accept gifts and hold property, but only the hospital management committees. Clauses 59, 60, and 61 were accepted.

SALARY OF THE M.O.H.

On resuming the discussion of clause 62 Mr. LIPSON asked if it was necessary for the Minister to take power to fix the salaries of officers, not only of the regional boards and executive councils but also of the local authorities. Mr. LINSTEAD, speaking as vice-chairman of the joint negotiation committee of the hospitals staffs, welcomed the Minister's intervention. Mr. BEVAN said he must resist the amendment, for it would disappoint many health workers. Where machinery for negotiation existed it was intended to use it, and where it did not exist to create new machinery on which the local authorities would be represented. It was surely undesirable that health workers performing the same work should be paid differently in different parts of the country. Moreover, they wished in the new proposals to give opportunity for easy transfer with superannuation

Medicine and the Law

The Herbalist's Manipulative Surgery

"Professor" Albert Lindley Payne, of Lindley House, tley Road, Shipley, an unregistered practitioner, leading "not guilty" to four summonses framed in arious ways under section 40 of the Medical Act, as fined £1 on each summons but was not directed pay any costs. Outside his premises there was a sign ontaining the words "manipulative surgery." He had igned certificates in which he added after his name e initials M.B.H.U. Whether or no these initials would ave conveyed to anyone the impression that M.B. tood for bachelor of medicine, they in fact meant no ore than that he was a Member of the British Herbalists' nion. A witness told the justices how she went to see he professor. She told him she was run down and ffered continually from colds. He examined her with stethoscope and gave her some medicine. She said hat the office where she worked was closed in and irless. He then gave her a certificate to produce to er employers. It was signed, according to the prosecuion, "A. Lindley Payne" followed by the letters .B. and others that were undecipherable. Another itness had visited the defendant. The witness had old him (as was true) that he had a duodenal ulcer. aving examined him with the stethoscope, Mr. Payne onfirmed the fact and drew a sketch of the ulcer. He ave the patient some bottles of medicine and packets f powder, and, as the patient said he would like some ighter work, he gave him a certificate signed apparently ith the same name and letters as before. For the efendant it was claimed that his character was blameess; he had practised as an unregistered practitioner or over twenty years. In cross-examination Mr. Payne aid that he saw about 3000 patients a year, manipulated amaged bones and limbs, and exhibited a sign that he as a herbal practitioner. The sign was produced. A word, covered over, in front of the word "herbal," urned out to be "medical." Mr. Payne said he had overed this word up "some time ago." He agreed that e had not explained to his patient that the certificate he gave her was not a medical certificate. Witnesses were called on his behalf who said they never thought he was a registered medical practitioner.

The use of the words "manipulative surgery" seems to need judicial consideration. The words "manipulative surgeon" were carefully examined in 1936 in *Jutson v. Barrow*; any unregistered practitioner who calls himself a "manipulative surgeon" does so with the definite risk of prosecution. It is not easy to see why "manipulative surgery" should have any different effect. The facts in *Jutson v. Barrow* are worth recalling. Captain Barrow put up a plate bearing the words "Captain H. Barrow, M.M., Manipulative Surgeon": he allowed himself to be described in the telephone directory as "manipulative surgeon," and he affixed to his motor-car a plate similar to the one displayed outside his premises. He was not registered under the Medical Act: he had never held any medical degree. When challenged at the instance of the Medical Defence Union, he wrote in reply that he was not using the title "surgeon": "prove that I am not a manipulative surgeon, and I will remove the title 'manipulative surgeon' from my plate." Lord Hewart observed that section 40 of the Medical Act set out certain well-known descriptions such as "physician" and "surgeon," the use of which is forbidden to unregistered persons, and "goes on to sweep into the net of what is forbidden any name which has the effect of implying that the unregistered person is a registered practitioner." The words in the section "implying that he is registered" are, added Lord Hewart, words not purporting to describe the intent of the individual, but are words describing the effect of the name, title, or addition. "The section is to protect the public, and what is regarded is not the mind of the individual but the meaning likely to be conveyed by the words that are used." What Captain Barrow was asserting was "I am a surgeon and, if you ask me what kind of a surgeon I am, I am a manipulative surgeon." But, said the Lord Chief Justice, "if he desires to represent to the public that he is not a qualified surgeon, it is a very unfortunate thing that he should choose the description 'surgeon,' preceded though it be by the word 'manipulative'.... The thing which makes the name 'surgeon' appear to be attractive and useful is precisely the thing which this section was enacted to prevent.... Speaking for myself, I cannot imagine any adjective which, being added to the title 'surgeon,' would excuse the use of the word 'surgeon' by a person not registered or recognised as a surgeon under the Act of 1858, unless, as for example in the case of a veterinary surgeon, he is expressly protected by statute." Mr. Justice Humphreys, following Lord Hewart, emphasised that the section contains no such words as "intent to deceive" or "intent to persuade persons that he is registered." The prohibition on the use of the protected words and titles, or of any other titles having the same implication, was absolute. Mr. Justice Singleton thought, by having a plate bearing the words "manipulative surgeon," Captain Barrow was using a description implying that he was recognised by law as a surgeon.

The upshot of those judicial views is that the blameless character and honourable intentions of an unregistered practitioner like Mr. Payne are not necessarily a defence to a summons under section 40. Meanwhile if members of the British Herbalists' Union are anxious to let the public know that they are not registered practitioners within the Medical Act, they might consider avoiding any possible confusion by refraining from the use of letters such as M.B., whatever the additions.

The proceedings against Mr. Payne were brought by the London and Counties Medical Protection Society which, with the other defence societies, has recommended to the General Medical Council "that addition be made to the present protected designations appearing in section 40 of the Medical Act to embrace abbreviations of recognised medical qualifications, the courtesy title of 'Dr.' when associated with the healing art, and any other description in common use that is accepted by the public and the profession as indicating that the user is a registered medical practitioner."

Fees and Bequest

A verdict of "suicide while not of sound mind" was recorded on June 25 at the St. Pancras inquest upon the death of the Hon. Leslie Gully, aged 48. There was evidence that death was due to an overdose of drugs supplied to her on the prescription of Mr. H. G. Bedford Russell. Mr. Russell gave evidence that the deceased suffered great pain from sinus trouble. He was questioned as to having received in the course of a year sums from her amounting to £10,000: it was stated that he would benefit to the extent of £25,000 under her will. The coroner observed that no criminal liability attached to Mr. Russell.

On the same day (June 25) a motion on behalf of the deceased's executor was mentioned in the Chancery Division. An action had been instituted to recover the sum of £10,000, and an injunction was applied for to prevent Mr. Russell from dealing with the sum involved. Sir Valentine Holmes, K.C., for Mr. Russell, intimated that the action would be defended; meanwhile his client would bring the sum claimed into court, but without any admission that he had received it as alleged or that he was under any obligation to return it. This disposed of the application for the injunction.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JUNE 22

Notifications.—Smallpox, 0; scarlet fever, 941; whooping-cough, 2026; diphtheria, 274; paratyphoid, 1; typhoid, 4; measles (excluding rubella), 4516; pneumonia (primary or influenzal), 496; cerebrospinal fever, 51; poliomyelitis, 13; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 93; puerperal pyrexia, 137; ophthalmia neonatorum, 57. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 4 (2) from measles, 4 (0) from whooping-cough, 2 (0) from diphtheria, 49 (5) from diarrhœa and enteritis under two years, and 7 (0) from influenza.

The number of stillbirths notified during the week was 261 (corresponding to a rate of 26 per thousand total births), including 38 in London.

of packed meals. Workers who have no access to canteens and who now have the special cheese ration will be able to secure coupons for an additional 6 bread units per week to assist them in providing packed meals from home. Special authorisations—e.g., for the benefit of agricultural workers at harvest time—will be granted for bread as for other rationed foods.

The Government believe, however, that even the above gradings as between different consumers will not sufficiently meet the wide variations in individual and family needs for bread, and the bread-unit coupons will therefore be interchangeable at the food office with ordinary points. The rate of exchange will be at the rate of 1 bread unit for 1 point, but for efficiency in control the food offices will only make the exchange in multiples of 8 at any time during each four-week period: in other words, it will not be possible to change less than 8 bread units into 8 points or vice versa. This provision, said Mr. Strachey, will have two effects. On the one hand it will offer an inducement to families which use less bread and flour than their ration to abstain from drawing their full ration; on the other, it will enable a family which finds that it needs more than its bread ration to supplement that ration by sacrificing some of its supply of points.

The Minister added that on the same date the meat ration will be increased by 2*d.* a week to 1*s.* 4*d.* The increase will be in carcass meat, so that the ration will then be 1*s.* 2*d.* of carcass meat and 2*d.* worth of canned meat. Meat supplies for manufacturing purposes, mainly sausages, will be increased by about 20% from Aug. 11.

Medical Expenses and Income-tax

During the committee stage of the Finance Bill in the House of Commons on June 25 Mr. A. J. CHAMPION moved a new clause providing for an allowance by way of deduction of income-tax in cases of illness arising out of a taxpayer's employment, trade, or vocation, and in respect of medical expenses incurred as a result of illness to the taxpayer or to his family. Such an allowance, he said, would afford a very welcome relief in times of exceptional difficulty.

Mr. GLENVIL HALL, financial secretary to the Treasury, thought it impossible to find a form of words which would meet disability and ill health of the kind to which Mr. Champion had referred. The new clause proposed would enable a man to take his whole family away to a sanatorium and charge the cost up as a medical expense against his income. Moreover, as the clause limited the relief to income under schedule D, it would exclude all those many employees who now paid income-tax under P.A.Y.E. The Government saw clearly the point which Mr. Champion was making, but they could not possibly accept this new clause.

Control of Penicillin

In the House of Commons on June 28 Mr. E. P. SMITH moved that the Control of Penicillin (No. 1) Order, 1946, dated May 21, 1946, be annulled. He said it made no mention of the unregistered practitioner who had been struck off the register for reasons unconnected with his medical skill and who would be debarred from using this invaluable drug. Also it permitted any Government department unconnected with public health to supply penicillin—a ridiculous state of affairs.

Mr. W. LEONARD, parliamentary secretary to the Ministry of Supply, said that £3 million had been spent on developing the production of penicillin, £2 million of it being Government money. It was not a universal cure and its indiscriminate use might be attended with grave consequences. With the new method of deep production now adopted production had risen from 3000 mega units a month in 1943 to about 300,000 mega units in June this year. Of this total about 120,000 units would be left for home consumption after the needs of the Services and the export trade had been met. Production was expected to increase fairly substantially over the next few months. The supply position did not justify uncontrolled distribution which might lead to a repetition of the experience of America where it was diverted to trivial uses. It was impossible to forecast the extent of civilian demand for penicillin until the commercial distribution had been in operation for some months. The Government thought that the present methods of distribution made the fullest possible provision for the treatment of all who might benefit from the administration of penicillin.

After further debate the motion to annul the Order was negatived by 145 votes to 45.

QUESTION TIME

Nationalisation of Hospitals

Major E. G. R. LLOYD asked the Minister of Health if he would give a list of the hospitals with which his department was at present negotiating for exemption from nationalisation. —Mr. A. BEVAN replied: I am not negotiating with any.

Manufacture of Hearing-aids

Mr. N. A. H. BOWER asked the Minister if he was aware that there are a number of firms with many years' experience in the manufacture and distribution of aural appliances whose products and methods of trading had been approved by the National Institute for the Deaf; and if he will use these firms in the production of the new aural aid.—Mr. BEVAN replied: The answer to the first part of the question is yes. The measures to be taken for the production of the Medical Research Council's hearing-aid are still under consideration.

Specialist Medical Officers

Mr. H. W. BOWDEN asked the Minister if he was aware that, through the failure of the Central Medical War Committee to call up specialist medical officers at a rate quick enough to replace those specialist medical officers in the Services who were due for release, it had been necessary to retard the release of these medical officers; and if he would speed up the call-up of those specialists who were eligible for service, in order that the serving medical officers might be released.—Mr. BEVAN replied: My department are in close touch with the Central Medical War Committee, who, I am satisfied, are making every effort to find replacements for specialists due for release.

Soap Supplies for Doctors and Dentists

Mr. L. D. GAMMANS asked the Minister of Food if he was aware of the hardship which would be caused to doctors and dentists by the cut in soap rations; and if he was prepared, on hygienic grounds, to make an additional allowance to them. —Dr. E. SUMMERSKILL replied: The special needs of doctors, dentists, and nurses have always been recognised; they have had a generous allowance as compared with other classes of the community. On this occasion, however, the Minister must apply the same proportionate cut as in the general ration, but this will still leave doctors, dentists, and nurses in a privileged position.

Russian Scientists' Visit to Britain

Major W. F. VERNON asked the Secretary of State for Foreign Affairs whether any arrangements were being made for inviting Soviet scientists to visit Britain in return for the visit which our scientists paid to Russia last year.—Mr. H. MCNEIL: Yes, sir. The Soviet Academy of Sciences has accepted the invitation of the Royal Society to send a delegation to the Isaac Newton tercentenary celebrations in London this month. Cordial invitations have also been issued by the Physical Society to a Soviet physicist to deliver the Guthrie lecture, and to the Soviet Academy of Sciences to nominate a delegation to attend a conference in Cambridge in July.

". . . It is always assumed that the curious little spines that produce the roughness of the ordinary cat's tongue have been evolved for the purpose of scraping flesh from bone. Yet I think that everyone who has a cat will own that for every occasion on which they have witnessed the cat rasping flesh from a bone with its tongue they have seen it conduct its very deliberate and well-ordered toilet by means of licking either its paws, or its furry coat direct, many scores of times. It is here that I would introduce what I believe to be a general principle that is usually entirely overlooked in studies such as this. *It is the commonplace, oft repeated, though trivial function, rather than the dramatic, though only very occasional, action that is apt to influence structure and to be perpetuated in heritage.*" —Prof. F. WOOD JONES, F.R.S., speaking on the Mammalian Toilet at the British Institution, 1945.

THE TUBERCULOSIS SERVICE AND THE FUTURE *

NORMAN TATTERSALL
M.D.Lond.
PRINCIPAL MEDICAL OFFICER, WELSH NATIONAL MEMORIAL ASSOCIATION

WHEN the tuberculosis service came into being some thirty-three years ago, those of us who entered this new branch of medicine had little idea of what lay ahead. Looking back we realise how slight was our knowledge of the disease process; we were still bound by the shackles of physical signs and could see little further than the length of our stethoscope. When I left Brompton I think I had never seen a chest X-ray film; or, if I had, it was such a bad one as to confirm the teaching of the day that radiology could do nothing to help one in tuberculosis. Marcus Paterson had recently wrought a minor revolution in the application of rest and exercise to the cure of the disease; we were firm believers in auto-inoculation and the opsonic index; we had no beds to speak of; and our armamentarium consisted of the stethoscope, a syringe, some dilutions of tuberculin, and great enthusiasm.

The first world war taught us many valuable lessons, and by the time it was over the radiographic era had already dawned. Probably the greatest achievement in these years has been the gradual building up of an organisation which has done more to guide and mould public opinion in the pursuit of positive health than any other public-health activity. Our work has never been solely confined to tuberculosis control; we have been a public-health agency primarily concerned with tuberculosis, but we have also taught the value of good health habits, proper nutrition, rest, and exercise. We have learnt and we have taught that we cannot limit our attention to tuberculosis and remain indifferent to other forms of chest disease or indeed to disease in any organ. We can claim a large share of the credit for the general health improvement of the last thirty years.

And now we have weathered another war, but this time we were not caught entirely unprepared. We have not marked time during this war, and we have demonstrated that war is not necessarily accompanied by an increased death-rate from tuberculosis.

SURGERY

It was a great day for the tuberculosis service when the surgeon took a place in our councils—and then proceeded to lay violent hands on the sacred precincts of the chest, the last stronghold of the physician. His advent gave a strongly practical turn to treatment; he learnt from us and we from him. He has introduced many operations, some of which have fallen by the wayside, while others have become our standard stock in trade. Above all he has introduced precision and has accelerated the trend away from empiricism and towards a basic scientific foundation in physiotherapy.

One result of the development of the tuberculosis service and its collaboration with the surgeon has been to give a tremendous impetus to thoracic surgery in general, a development which would not have reached its present stage without the facilities and wealth of material which have accrued from the stimulus given to the investigation of all forms of chest disease by our service.

We are on the eve of an immense scheme of reorganisation of the medical services in this country. During the war the establishment of surgical chest units became an urgent necessity, and many of these have, quite logically, been established at or in close touch with tuberculosis institutions. The operative technique and postoperative care are much the same for tuberculous and non-tuberculous conditions, and the results are most successful when carried out by a team in constant practice. It is inevitable, and right, that unity of need between tuberculous and non-tuberculous conditions should be recognised in the coming reorganisation; and in this respect, as in many others, the tuberculosis service has much to gain by a closer collaboration in the general field of medicine and surgery.

REGIONALISATION

Having mentioned the impending changes in the whole fabric of medical practice, I wish to say something about one aspect of this subject on which we can claim some knowledge and experience in Wales—I mean regionalisation.

Aiyar refers to the Welsh tuberculosis scheme as follows:

> "In 1912 the Welsh National Memorial Association was founded . . . a living example of the wisdom, imagination, and vision of its founder, the late Lord Davies of Llandinam and his co-workers. Here is an illustration of Wales as a region, with executive administration, and indeed it seems that Wales had forestalled all this recent talk of regionalisation before anyone even dreamt of such possibilities. That in itself is a great tribute to the people of Wales."

The *British Medical Journal* (Dec. 8, 1945) stated:

> "The unification of the Welsh counties in this admirable tuberculosis scheme shows how the needs of a whole area can be planned without disproportionate regard for the natural but inconvenient loyalties of local areas. The Welsh Tuberculosis Scheme is indeed a model which should be studied widely by English counties and county boroughs."

I can refer to these comments quite impersonally, as I had no share in the concept and design. It is indeed a memorial to Lord Davies and to its first principal medical officer, Marcus Paterson.

Under the new Government scheme planning of our hospital and consultant services will be on a regional basis. To this audience there is no need to labour the weakness of the existing tuberculosis service, which, as stated in the Joint Tuberculosis Council's reorganisation report, embodies 188 separate scheme-making authorities, each of which can frame its own interpretation of the words "make adequate arrangements" for dealing with tuberculosis in its own area. We all know the variation in standards of achievement which has resulted. Some schemes are as good as anything in the world; about some of the others the less said the better. As Gregory Kayne put it:

> "Each local authority must provide a . . . scheme which, given some sort of dispensary and institutional beds, conforms to the letter of the law; the extent to which the spirit of the law is applied is left to the conscience, and knowledge or ignorance on tuberculosis matters, of the local authority and its medical officer of health."

An expression often heard in Wales is "speak as you do find"; and, though I am only too well aware of certain failings and weaknesses of the Welsh scheme, I propose to "speak as I do find" of what, thanks to the vision of David Davies, regionalisation has meant to Wales. Here is a population of $2^{1}/_{2}$ million distributed throughout 13 counties and 4 county boroughs. Dense though the population is in some areas, for the most part the country is mountainous and sparsely populated. For tuberculosis administration the country is divided into 17 dispensary areas, each well equipped with central clinics and outlying visiting stations. No patient has far to go for radiography or a pneumothorax refill. John Jones who lives in a remote mountain farm has as good a chance as a resident of Cardiff of admission to

---

* Abstract of presidential address delivered to the Tuberculosis Association on Jan. 18, 1946.

Harvard Chair of Pediatrics

Dr. Charles Alderson Janeway has been appointed physician-in-chief at the Children's and Infants' Hospital, Boston, Mass., and succeeds to the Thomas Morgan Rotch chair of pediatrics at Harvard University, vacant since the death of Dr. Kenneth D. Blackfan in 1941.

Dr. Janeway, who is 37, belongs to one of America's most illustrious medical families. His grandfather was Prof. Edward Janeway, and his father, Theodore Janeway, who died from influenza in 1917 at the age of 45, had three years earlier become the first full-time professor of medicine in the English-speaking world when he was appointed to the chair at Johns Hopkins formerly held by Osler.

After graduating A.B. Yale in 1930 and M.D. Johns Hopkins in 1934, Dr. Janeway became in turn research fellow, demonstrator in bacteriology, instructor in medicine, and in 1942 assistant professor of pediatrics at Harvard. His many writings have been mostly on infectious diseases and immunology, and his recent work on plasma proteins has attracted attention widely.

Films in Microbiology and Protistology

The films made under the direction of Dr. Comandon by the Département de Cinémicrographie, Institut Pasteur, Garches, S. et O., will be brought to this country shortly. They include those reviewed recently in *The Lancet* (Jan 19, 1946, p. 111) and in the *British Medical Bulletin* (1946, 4, 72); also films on *Amœba verrucosa*, karyokinesis, and lankesterella. They are silent films on 35 mm. stock with captions in French. A selection of these films will be shown in London by the British Council at 5 P.M. on Monday, July 15. Seats will be allotted in rotation on application to the council at 3, Hanover Street, London, W.1. (Tel.: Mayfair 8484, ext. 134.)

Rations for the Tuberculous

Last November the Minister of Health said in the House of Commons that tuberculosis patients were entitled to supplementary ration allowances. The Joint Tuberculosis Council has now obtained a statement to the effect that:

(1) Tuberculous patients in institutions are entitled to normal civilian rations and points goods.

(2) Tuberculosis institutions, along with other institutions, are entitled to priority supplies of goods such as dried eggs and jellies.

(3) Tuberculous patients are granted two pints of milk per day and 2 oz. of cooking fat per week instead of the normal civilian allowances of these foods. In addition, if the institution concerned possesses a deep fat frier, a special allowance of 2 oz. per head per week of frying fat can be obtained.

European Visitors Study Municipal Services

Some 40 administrators from the Continent are attending courses on local-government services arranged by the British Council in coöperation with the local authorities at Chester and Perth. The Chester programme includes lectures by Dr. J. W. Lobban and Dr. W. H. Grace, and visits to Chester Royal Infirmary, Chester Hospital, and Moston Military Hospital.

Medical Diary

JULY 7–13

Monday, 8th

Royal Society Empire Scientific Conference
10 A.M. (University College, Gower Street.) Final session.
2.30 P.M. (Royal Institution.) Dissemination of Scientific Information to the General Public.

Medical Society of London, Cavendish Square, W.1
8.30 P.M. Dr. Simon Yudkin, Prof. John Beattie: Nutrition.

Tuesday, 9th

Royal College of Physicians of London, Pall Mall East
5 P.M. Dr. P. M. D'Arcy Hart: The Search for Chemotherapeutic Agents in Human Tuberculosis during the Past 100 Years.

Royal College of Surgeons of England, Lincoln's Inn Fields
5 P.M. Prof. John Beattie: Physiology of Convalescence. (Second lecture.)

Royal Society of Medicine, 1, Wimpole Street, W.1
5.30 P.M. *Experimental Medicine and Therapeutics.* Annual general meeting. Dr. J. H. Humphrey and Dr. H. Joules: Penicillin Inhalation for Pulmonary Infection. Dr. F. Avery Jones and Dr. J. H. Humphrey: Management and Biochemical Studies in Severe Oliguria following Abortion.

London School of Dermatology, 5, Lisle Street, W.C.2
5 P.M. Dr. R. T. Brain: Electrotherapeutics.

Wednesday, 10th

Royal College of Surgeons of England
5 P.M. Dr. Peyton Rous: The Antecedents of Cancer. (Walker prize lecture.)

Thursday, 11th

Royal College of Surgeons of England
5 P.M. Sir Frank Colyer: Dental Disease in Animals. (Charles Tomes lecture.)

Liverpool Medical Institution
4 P.M. Mr. George Perkins: Bone Grafting. (Hugh Owen Thomas memorial lecture.)

Friday, 12th

Mental Hospitals Association
11 A.M. (Guildhall, London.) Annual meeting.

Appointments

Cole, C. W. D., M.R.C.S.: asst. M.O.H. and school M.O., West Bromwich.
Ferguson, William, M.B. Aberd.: tuberculosis M.O., Derbyshire.
Macgregor, Murdoch, M.D. Glasg.: M.O.H., Bethnal Green.
Thomas, E. W., M.B. Glasg., F.R.C.S.E., F.R.F.P.S.: superintendent, West Park (County) General Hospital, Macclesfield.

Queen Charlotte's Maternity Hospital, W.6.—The following appointments are announced:—
- Clayton, S. G., M.S. Lond., F.R.C.S., M.R.C.O.G.: obstetric surgeon.
- Evans, A. Briant, M.B. Camb., F.R.C.S., M.R.C.O.G.: obstetric surgeon.
- Franklin, A. W., M.B. Camb., F.R.C.P.: asst. pædiatrician.
- Hare, Ronald, M.D. Lond.: director of pathology and research.
- Robinson, Kathleen, M.D. Lond., F.R.C.S., M.R.C.O.G.: obstetric surgeon.

Woolwich Memorial Hospital, S.E.18.—The following appointments are announced:—
- Cooper, D. M., M.B. Lond., F.R.C.S.: asst. surgeon.
- Gleadow, E. F., L.M.S.S.A., D.A.: anæsthetist.
- Le Vay, David, M.S. Lond., F.R.C.S.: orthopædic surgeon.
- Loxton, G. E., M.B. Camb., M.R.C.P.: asst. physician.
- Pearson, R. S. B., D.M. Oxfd, F.R.C.P.: asst. physician.
- Rae, W. K., M.R.C.S., D.A.: anæsthetist.
- Shuttleworth, C. W. T., L.R.C.P., L.D.S.: asst. dental surgeon.
- Townsend, C. G., M.B. Camb., D.A.: anæsthetist.
- Walker, F. O., M.R.C.S., D.O.: ophthalmic registrar.
- Wyman, J. B., M.R.C.S., D.A.: anæsthetist.

Middlesex County Council.—The following appointments are announced:—
- Butterworth, Beatrice A., M.R.C.P.: tuberculosis M.O., Finchley.
- Clark, A., M.D. Lond., M.R.C.P.: tuberculosis M.O., Ealing.
- Heggie, J. F., M.B. Glasg.: pathologist, North Middlesex County Hospital, N.18.
- Jones, I. D., M.B. Lond., D.A.: senior anæsthetist, Central Middlesex County Hospital.
- Laird, Robert, CH.M. Glasg., F.R.C.S.E.: thoracic surgeon, Clare Hall County Hospital.
- Lorriman, F. G., M.D. Durh., F.R.C.S.E., D.O.M.S.: ophthalmic surgeon, West Middlesex County Hospital.
- Macdonald, Norman, M.B. Edin., M.R.C.P.E.: tuberculosis M.O., Willesden.
- Morton, H. J. V., M.D. Camb., D.A.: senior anæsthetist, Hillingdon County Hospital.
- Sakula, Jack, M.D. Lond., M.R.C.P., D.C.H.: pædiatrician, Central Middlesex County Hospital.
- Spence, A. C., M.R.C.S.: pathologist, West Middlesex County Hospital.
- Toussaint, C. H. C., M.R.C.S.: tuberculosis M.O., Tottenham.

Births, Marriages, and Deaths

BIRTHS

Alexander.—On June 26, in London, the wife of Dr. R. S. Alexander—a son.
Bruce.—On June 21, in Edinburgh, the wife of Dr. J. Alastair Bruce—a son.
Bull.—On June 30, in London, the wife of Dr. James Bull—a son.
Cuthbert.—On June 27, in London, the wife of Dr. Olaf Cuthbert—a daughter.
Darbishire.—On June 27, the wife of Dr. Stephen Darbishire, of Greenodd, Lancs—a son.
Neill.—On June 23, at Bath, the wife of Dr. Gordon Neill—a son.
Wright.—On June 26, in London, the wife of Major H. B. Wright, R.A.M.C.—a son.

MARRIAGES

Corbett—Scott.—On June 25, in London, Anthony Ralph Corbett, M.R.C.S., to Elizabeth Margaret Moir Scott.
Floyer—Burns.—On June 8, Michael Antony Floyer, M.B., M.R.C.P., flight-lieutenant R.A.F.V.R., to Lily Louise Frances Burns.
Grant—Baird.—On June 24, in Birmingham, Robert Neville Grant, M.R.C.S., to Audrey M. Baird.
Kinmonth—Godfrey.—On June 26, in London, John Bernard Kinmonth, F.R.C.S., squadron-leader R.A.F., to Kathleen Margaret Godfrey.
McGregor—Whithouse.—On June 22, in London, William Lindsay McGregor, M.B., to Aileen Janet Whithouse.

DEATHS

Adams.—On June 27, Annie Dorothy Mann Adams, B.M. Oxfd, late medical officer, R.A.F.V.R.
Baines.—On June 28, at Whitby, Edward Baines, M.B. Camb., D.P.H., aged 80.
Henry.—On June 24, at Debenham, Suffolk, Howard Henry, M.C., M.D. Dubl., aged 70.
Jessel.—On June 23, at Eccles, Manchester, George Jessel, M.A., M.D. Oxfd, D.P.H., consultant tuberculosis officer, Lancashire County Council, aged 63.
McKellar.—On June 24, in Newcastle, William Anderson McKellar, M.B. Glasg.
Manuk.—On July 1, Mack Walter Manuk, M.B. Edin., late I.M.S. and Colonial Medical Service (Northern Nigeria), aged 74.
Ward.—On June 24, at Parkstone, Espine Francis Ward, M.D. Belf., aged 65.
Whitmore.—On June 26, Alfred Whitmore, M.D. Camb., lieut.-colonel I.M.S., of Madingley, Cambridge.
Williamson.—On June 27, at North Shields, James Burrell Williamson, M.B. Durh., formerly medical superintendent, Preston Hospital.

Major-General O. W. McSheehy, C.B., D.S.O., has been appointed colonel commandant of the Royal Army Medical Corps in succession to Major-General H. P. W. Barrow, who has reached the age-limit for this appointment.

unit in doing a combined tuberculin and radiographic survey of some 10,000 school-children in Merthyr. The results are not yet published, but I have Dr. T. H. Stephens's consent to quote this finding. In one school, standards 2, 3, and 4 contained 51 children, with an average age of about 9½ years; these 51 children yielded 6 positive reactors; but, in standard 1, among 26 *younger* children (average age 8 years), no less than 15 reactors were found. Inquiry elicited that the school teacher had had "bronchitis," had been away sick, had left the district, and was a patient in an English sanatorium.

We have no grounds for complacency when we contemplate these 40,000 (and it may well be 80,000) sources of infection in our midst, but the solution at the moment is not on the lines of the American legislation I have mentioned. Legislation must not get too far ahead of public opinion or it will fail.

In Sweden legislation has taken a more practical turn, and their "Law relating to dispensaries" of 1940 shows constructive thought. Their death-rate, in the latest figures I have seen (1938), was slightly higher than in this country but was falling rapidly. Their provided beds, on a population basis, are more than double our own. A main provision in their law is compulsory notification, which includes pleurisy, erythema nodosum, and phlyctenula. After notification (1) the tuberculosis officer *must* examine the home, and report on its hygiene; (2) *all* members of the home *must* be examined by tuberculin test, and all positives radiographed; and (3) any other contacts *must* attend for examination if the tuberculosis officer considers it necessary. The law also lays down in detail the measures to be taken for disinfection of homes, bedding, &c.

In this type of legislation we see that sense of central direction which has been so lacking in this country. Here we have 188 separate scheme-making authorities, each with executive powers, but they are left largely without central advice regarding what the Public Health Act of 1936 means by the phrase "adequate arrangements" for dealing with the problems of tuberculosis.

EARLY DIAGNOSIS

The late Sir Pendrill Varrier-Jones in 1940, criticising the tuberculosis service, compared it to an aeroplane without wings or rudder—he said "it is impressive so far as it goes, but it does not go far enough in either direction—it is all middle and no ends." The missing ends, he said, were "early cases" and "rehabilitation," and, so long as the first was missing and the second undeveloped, the whole scheme was rendered inadequate.

There was a great deal of truth in his criticism, but it is less true today than when he wrote it. It is still unhappily true that of the cases which reach our clinics mainly on symptomatic grounds there is a far too high percentage of advanced disease, but a close study of the figures given in annual reports shows a definite trend of improvement. In Wales, for instance, although the death-rate has fallen substantially during the war years, there has been a considerable increase in the new cases notified. But an analysis of the figures shows that the increase is entirely in the sputum-negative group, and that, although 750 more pulmonary cases were diagnosed in 1944 than in 1939, the total of sputum-positive cases fell by 200 and the sputum-negative group increased by 950.

This swing in favour of the sputum-negative diagnosis surely indicates a higher proportion of earlier cases. A material factor—probably *the* material factor—in this improved finding of the minimal case is the enormous increase in the number of individuals who pass annually through the sieve of radiography. The extent of this increase is not shown in anything like its actual volume by a mere study of the numbers who pass through the tuberculosis clinics, impressive though these figures are. The impact of the lessons learnt by our service has been felt by the general hospital, where the practice is steadily growing of taking a chest radiogram of almost every case admitted and of an increasing number of outpatients.

The Services too have taken up the theme with vigour both by miniature and large-film methods. To all this is added the half-million or so people who, even with our present limited scheme, may be expected to be examined annually by mass radiography. This half-million is only about 1% of the total population, but they are mainly chosen from the most vulnerable age-groups, and therefore it is a more searching screen than the bare numbers suggest.

As a rough guess then it seems probable that between 2 and 3 million people in this country are having chest radiography each year; and, as they are drawn either from the ailing, contacts to known cases, or from the most susceptible age-groups, the number of favourable cases discovered must rise. This huge volume of work is educating public opinion so rapidly that the man in the street is coming to know that a chest examination without a film is of comparatively little value, and he expects to be dealt with accordingly.

The percentage of cases found by the older and the newer methods are well known but will stand repetition:

> If we assume that the grouping of cases on admission to institutions is a fair index of the stage of their discovery, we find that in 1938 the average cases admitted to all sanatoria were minimal 13%, moderately advanced 32%, and far advanced 55%. On the other hand, the cases found by mass radiography of the presumed healthy are 62% minimal, 31% moderately advanced, and only 7% far advanced. And the experience of the Metropolitan Life Assurance Company in America has proved that, by the routine use of annual radiography and medical examination of their employees, the admissions to their own sanatorium achieve percentages almost identical with the mass-radiography findings: 59% minimal, 36% moderate, and only 5% advanced.

Here, then, is proof of what can be done and a clear road marked out for us to follow. We still have a long way to go, but the sting of Varrier-Jones's criticism about our failure to find the early case is being slowly but surely removed.

REHABILITATION

What about the other criticism—the other "missing end"—rehabilitation? Here again one must admit the truth of the criticism. There is no need to labour this point; all of us are aware of and fully admit that, with all our improving diagnosis and advances in treatment, our scheme breaks down badly at the point where the more or less restored individual has to be reintroduced to and maintained in the working conditions of everyday life.

A difficulty which I am sure many of us find when discussing rehabilitation problems with lay committees is that of proving the special case of the tuberculous—that tuberculosis has features distinct from most other chronic disease—and that methods which are easy of application, say, to the war wounded and crippled cannot meet the needs of the tuberculous. In a recent memorandum on financial assistance for the tuberculous, Dr. C. K. Cullen sums up the special position of tuberculosis as follows:

> "The chronicity and duration of the disease are by no means the only factors. . . . The long-continued infectivity, family susceptibility, the need for high standards of nutrition, housing accommodation, environment, and recreation facilities, the relationship of anxiety and other psychological reactions to the progress of the patient and the peculiar difficulties of rehabilitation—are all factors which must be taken into account. . . . It is doubtful whether any other disease creates a comparable financial and social need for the family concerned."

I have already referred to the increasing assumption of Governmental responsibility in the tuberculosis institutions which are second to none in the British Isles. Facilities for anything from radiography to a thoracoplasty are as easy for the one as the other. The boundaries of the areas are geographical rather than statutory; hence the patient can attend at the clinic which is easiest of access.

The 18 institutions vary in size from the small local hospital to the 400-bed sanatorium. Nearly every area tuberculosis officer has beds under his own control, and every general hospital in the country makes use of the services of the medical staff—not for tuberculosis only but also as consultants on chest disease in general. The medical staff of both area and institution meet periodically to discuss their clinical and administrative problems and work together as a friendly team. Although each officer has freedom to adapt his service to local peculiarities, the general level of achievement is controlled from the administrative centre in Cardiff.

The general fabric and equipment of the many institutions are surveyed and kept abreast of progress through a central maintenance department, and items such as sterilising dish-washers and Aga cookers are just as likely to be found in the smallest local hospital as in the largest sanatorium.

The organisation is large enough to have its own central research laboratory and is planning a considerable expansion of this department. Finally, the whole scheme is closely linked to the university through the chair of tuberculosis held by Prof. W. H. Tytler, who is also director of research. In the clinical teaching of students full use is made of the services of tuberculosis officers and medical superintendents as lecturers, and the students visit and are taught at our institutions, and some of them hold resident student-houseman posts in their final year.

Good as all this may seem, there are also grave defects:

(1) The service of tuberculosis health visitors, for instance, has been left in the hands of the local authorities, and one at once sees the variations in standard and performance which such a system implies; well done by some, by others it is hardly carried out at all, and for the most part the contact between tuberculosis officer and health visitor is poor. This is no argument against regionalisation but merely an example of what happens when regionalisation is not carried to its logical conclusion.

(2) The Public Health Acts place the responsibility for a great deal of preventive medicine on urban and rural district councils, many of which in Wales are so small in population and so poor financially that they cannot possibly afford the expenditure which would have to be incurred to carry out the duties properly. In many areas the salary of one health visitor would mean a 2*s*. rate.

(3) Aftercare remains in the hands of the county and county-borough councils and until recently has been more honoured in the breach than the observance.

(4) We have no colony, and rehabilitation measures are still in their infancy, but the development of such services should be much more easy of ultimate attainment under a regional than a local authority scheme. What sort of a service would Wales have had if instead of one there had been 17 different schemes all—as Kayne said—"left to the conscience and knowledge or ignorance on tuberculosis matters of the local authority and its Medical Officer of Health"?

The Welsh tuberculosis scheme is far from perfect, but it has attained a good standard of achievement over the whole area. What is good is largely the result of regionalisation, and what is lacking could be remedied by applying the same principle to the matters which are still left in the hands of the local authorities. If housing, health visiting, and notification could be organised in areas larger than those of the small local authorities, say on a county and county-borough basis, and at the same time strong central direction given as to the standards which must be achieved, most of our weak points would be eliminated.

The recent introduction through governmental action of mass radiography and treatment allowances indicate the value of central direction and leads me to some remarks on legislation in the control of tuberculosis.

THE LAW AND TUBERCULOSIS

In my reading of tuberculosis literature I have been struck with the varying attitude in different countries about the advisability of using compulsory measures, legally enacted, for the control of the chronic infectious case.

When I visited Chicago, in 1930, I was expecting to hear a lot about their legislation (I think it was called the Glackin Act), by which (so I had read) no sputum-positive patient was allowed to remain in home contact with any child for more than twenty-four hours after the case was discovered. Either the patient was removed to a sanatorium or the children were boarded out in safety. If the patient stayed at home, a placard was fixed in front of the house "Tuberculosis—Keep Out" and was supposed to remain there until three successive sputum tests showed the patient safe once more. How far this scheme worked we could not find out, but at that time Chicago was the mecca of racketeers, and it was suggested that for a price anyone could obtain the certificate of his non-infectiousness.

Banyai and Cadder have lately discussed the problem of tuberculosis carriers, legislation, and compulsory segregation in America, and it appears that many states and districts now use these methods on a considerable scale. Wisconsin, California, Connecticut, Columbia, Kansas, Minnesota, Missouri, New Jersey, and a few more appear to exercise legal powers freely to segregate their chronic infectious cases in special wards of sanatoria and even in specially adapted gaols. These authors consider that such segregation is a necessary complement to mass surveys and essential to the eradication of tuberculosis. Possibly public opinion in America is ripe for such action.

As pointed out by Ferguson, of Saskatchewan, as schemes for tuberculosis control gradually attain their objective, a stage is reached at which there are so few positive tuberculin reactors in the population that the problem of control has reached a fair degree of solution and the objective must be altered from control to eradication. At that stage segregation of the sputum-positive individual may become a highly effective measure of elimination.

In this country we have the necessary legal machinery to compel the isolation of the careless or dangerous person who will not accept the segregation which is offered, but this power has rarely been invoked. Most of us believe that such repressive measures would in the long run be a rod for our own backs by driving the problem underground, and that concealment would be even worse than the known danger. At the present moment when we do not possess the beds (if we have the beds we haven't the nurses) to treat the willing cases, it appears farcical to exercise such powers in any but the most exceptional case. I do not wish to minimise the risk which this mass of cases involves. In this country we have roughly 30,000 institutional beds for tuberculosis, and 70,000 *known* sputum-positive cases, apart from the 200,000 or so other cases on our registers. Thus there must always be some 40,000 known positive cases at large and possibly almost as many again who are unknown —and even more dangerous. Where are they? In their homes, in the streets, in buses, factories, schools—everywhere.

Here is an interesting example of the risks involved.

> Some large-scale tuberculin surveys have recently been carried out in Wales, and the medical officer of health has collaborated with our mass-radiography

I believe that in the Disabled Persons Act we have been given a power which, if wisely used, can revolutionise the outlook for the patient leaving a sanatorium. The scheme will have to be closely wedded to the sanatorium workshop or other form of light industry in which trial of a patient's fitness can be made; but gradually there should evolve an understanding of the needs of the tuberculous patient which will banish that fear which is such a big deterrent in their cure—not fear of the disease but fear of becoming sufficiently well to be sent out into the world to try to do jobs which they know are beyond them. Here, in the special industry, the sheltered workshop, or even in full competitive work, is the opportunity to restore independence, to return a man's earning capacity and make him a taxpayer—to silence once and for all the taunt that all we can do is to turn sick workers into healthy loafers. Here is a sincere effort to build that other "missing end" to which Varrier-Jones devoted so many years of work and thought.

VARIATIONS IN REPRODUCTIVE PATTERN ACCORDING TO SOCIAL CLASS *

DUGALD BAIRD

M.D., B.Sc. Glasg., F.R.C.O.G., D.P.H.

REGIUS PROFESSOR OF MIDWIFERY IN ABERDEEN UNIVERSITY

BRITAIN, in common with many countries in Western Europe, North America, Australia, and New Zealand, finds itself faced soon with a total fall in the population which can only be checked by an increase of fertility. The statistics bearing on this problem in England and Wales were well set out by Titmuss (1945), and most of the national statistics quoted here have been obtained from his paper.

During the last ninety years the population of England and Wales has risen steadily (table I). To begin with, this was associated with a very high birth-rate, but since 1891 the birth-rate has been falling, and the continued increase in the population has been due more to the falling death-rate. Since 1891—i.e., in the last fifty years—the number of women in the reproductive age-group has risen by three million, and the number of married women aged between fifteen and forty-five has grown by two million. Despite this, the number of live births each year is lower by 309,000.

TABLE I—STATISTICS OF MARRIAGES AND BIRTHS PER POPULATION, 1851–1938

Year	Total population	Women aged 15–45	Married women aged 15–45	Annual live births	Average for
1851	17,928,000	4,235,000	2,004,000 (*47*)	647,000	1851–1860
1861	20,066,000	4,721,000	2,320,000 (*49*)	750,000	1861–1870
1871	22,712,000	5,240,000	2,601,000 (*50*)	859,000	1871–1880
1881	25,974,000	5,990,000	2,943,000 (*49*)	889,000	1881–1890
1891	29,003,000	6,891,000	3,244,000 (*47*)	916,000	1891–1900
1901	32,528,000	8,121,000	3,804,000 (*47*)	930,000	1901–1910
1911	36,070,000	8,990,000	4,288,000 (*48*)	810,000	1911–1920
1921	37,887,000	9,468,000	4,596,000 (*49*)	713,000	1921–1930
1931	39,952,000	9,825,000	4,918,000 (*50*)	607,000	1931–1938
1938	41,215,000 (estimated)	9,954,000	5,396,000 (*54*)	..	..

In the tables italicised figures in parentheses represent percentages.

The population is naturally affected more by a fall in the death-rate in the young age-groups than among old people, and it is just in these young groups that the mortality has decreased most. Table II shows a very striking fall in the infant mortality from 150 to 50 in forty years and a much smaller fall in the general mortality-rate. There has also been a considerable fall in the birth-rate.

CALCULATION OF FERTILITY

The crude birth-rate does not give an accurate idea of fertility, however, since the composition of the population has to be considered. To calculate fertility we must know the number of women aged between fourteen and forty-five and the amount of marriage. These numbers are constantly changing and are affected by many factors, but it is possible to calculate the average number of girl babies, potential mothers, born to a woman throughout the child-bearing age. This is called the gross reproduction-rate. Some of these girls do not survive to maturity; and, if allowance is made for this, we get the net reproduction-rate. A net reproduction-rate of 1 means that if birth-rates and death-rates remain constant in each generation, one mother will be replaced by another and the population will remain constant. In 1881 this rate was 1·5, and in 1933 it was 0·74 (Scotland 0·9). The net reproduction-rate in that year, therefore, in England and Wales was 25% below replacement and would have led by now to a fall in the total population but for the great fall in the death-rates and the large number of women reaching the very fertile age-period from twenty to thirty-five years, during the last fifteen years, resulting from previously high birth-rates. Since 1931 the number of married women under forty years of age has risen by 20%, and in the period 1939–42 there was a record number of marriages. During the last ten years there have been approximately 500,000 additional early marriages. This has depleted our marriageable stocks and has had a relatively small effect on the crude birth-rate. In 1941 the birth-rate touched bottom at 14·2, in 1942 it was 15·8, and in 1943 16·5. Before the war of 1914–18 the birth-rate was 24, and by the end of that war it had fallen to 17·7. In 1942, despite the advantages of nearly 1,000,000 more potential mothers, there were fewer births than in the worst year of the last war. The hitherto low record level of 17·7 in 1918 rose to *25·5 in 1920. From this peak it steadily declined.*

TABLE II—MORTALITY-RATES, 1841–1939

Year	Deaths of infants under 1 year per 1000 live births	Standardised death-rate per 1000 living	Live births per 1000 population of all ages
1841–1845	148	20·6	32·3
1846–1850	157	22·4	32·8
1851–1855	156	21·7	33·9
1856–1860	152	20·7	34·4
1861–1865	151	21·4	35·1
1866–1870	157	21·2	35·3
1871–1875	153	20·9	35·5
1876–1880	145	19·8	35·3
1881–1885	139	18·7	33·5
1886–1890	145	18·5	31·4
1891–1895	151	18·5	30·5
1896–1900	156	17·6	29·3
1901–1905	138	16·0	28·2
1906–1910	117	14·4	26·3
1911–1915	110	13·7	23·8
1916–1920	90	13·4	20·1
1921–1925	76	10·9	19·9
1926–1930	68	10·3	16·7
1931–1935	62	9·6	15·0
1936 ..	59	9·2	14·8
1937 ..	58	9·2	14·9
1938 ..	53	8·5	15·1
1939 ..	50	8·5	14·9

It was thought that after the last war a change in reproductive trend had started. Some say that this war has led to similar changes in reproductive habits, but there is less justification for this view. Early marriage and the early birth of a first child does not mean that families will be larger. There is no doubt that, unless there is a big change in outlook and an increase in the size of individual families, we shall soon have a decline in the total population, a great decrease in the number of young people, and an increase in the campaign, and in the last three or four years several official schemes have been put forward which have not yet been fully developed but show the trend of official responsibility and action, and in the Disabled Persons Act we have an instrument with enormous potentialities.

---

* A lecture delivered to the Royal Medical Society of Edinburgh, Jan. 25, 1946.

The recent official schemes fall under two headings: (1) the provision of educational courses for patients while undergoing institutional treatment; and (2) the training, rehabilitation, and resettlement in industry *of the tuberculous patient.*

On the educational side there was the Ministry of Health circular 5/45 of a year ago dealing with the provision of educational courses for civilian patients likely to be detained in hospitals for long. The circular places the onus for such provision on the local authority through its chief educational officer, and the only responsibility on the medical superintendent is that of establishing contact between the patient and the educational authority. So far as my knowledge goes, and certainly in Wales, this scheme is in a state of suspended animation. The provisions of the new Education Act appear to have thrown such a strain on the resources of the local authorities that their part of this proposal has not been attempted. Certainly there are great difficulties—I can quote for instance the attitude of the local education authority in one Welsh county in which is situated an institution drawing patients from all over the principality, with a very small minority of their own ratepayers. Why should they, it is argued, shoulder this expense of providing educational courses for patients normally resident outside their area?

It may be that this scheme will never bear much fruit, but its importance is the official recognition of a need, even if this first attempt to meet it should fail. In America the provision of educational courses is being widely developed, and in the *Montefiore Hospital* in New York some 40–45% of patients are engaged in formal educational courses. The idea was well summarised by Helen Becht in 1944:

> "Not every hospital can have on its staff educators who are prepared to attack every level of learning which the patient-group may need, but every hospital should have, somewhere in its personnel, a person who will have sufficient interest in patients as people, sufficient awareness of the vast range of individual differences among them, and sufficient knowledge of the facilities which the community provides, to make some connexion with the extramedical needs of patients and the opportunities which are available to meet those needs. . . . In every hospital an educational programme *can* be inaugurated . . . but it will fail in its purpose unless it be founded on full coöperation and approval with the medical policy of the institution. . . . In the hospital, activity can be started which has a meaning . . . *there* can be born the desire and fact of being busy at something which is not confined to the lives of those who are ill . . . and which weans them from the insecurities which illness breeds."
>
> "Librarians, occupational therapists, social workers, nurses, teachers . . . are all educators . . . but to have full value the work of all must be . . . properly integrated . . . and all with medical supervision."

RESETTLEMENT

So much for education—what about the more direct settlement into industry? The first step in this direction was the Ministry of Labour's Interim Scheme for the Training and Resettlement of Disabled Persons, under which ex-Service and civilian patients can be trained in various occupations at special centres set up by the Ministry of Labour. This scheme has worked fairly well for those patients who were getting on top of their disease; and, while war conditions of labour prevailed, it enabled a considerable number of patients to learn jobs and hold them at good wages. Now, in the piping days of peace, their problem will be less easy. The light repetition job ceases, and they drift, often without advice, to the heavier job, which proves too much for them.

Under the Disabled Persons (Employment) Act, 1944, a much more hopeful and wider scheme for training and rehabilitation has opened out. It has been expressly stated that the provisions of the Act and the definition of a "disabled person" apply fully to tuberculous patients.

Under this Act all disabled persons are invited to *register with the labour exchange, and the benefits* of the Act will only apply to those who do so. At every local office of the Ministry of Labour there is a disablement rehabilitation officer (D.R.O.), whose special duty is to advise disabled men and women and to help them to find suitable employment. The D.R.O. is in touch with all hospitals in his area and visits the patients; the closest liaison is to be maintained between the D.R.O., the medical superintendents of institutions, and tuberculosis officers, so that the placing of a patient in employment may be definitely suited to his mental and physical capacity.

Every employer with twenty or more workers must employ a certain quota of registered disabled persons. The Act also gives the Minister power to designate "certain classes of employment for the special benefit of disabled persons who are registered." This provision may be of great service to the tuberculous by allocating a higher proportion of registered tuberculous patients to certain industries in which the conditions of work are particularly suited to their condition. Although it is the policy of the Ministry to place disabled persons in open employment whenever possible, section 15 of the Act empowers the Minister to provide facilities for employment or work under *special conditions* for the severely disabled who are unlikely to be able otherwise to obtain *employment. These facilities may be provided directly* by the Ministry or indirectly by local authorities or voluntary associations. This provision opens up the possibility of great development in the matter of sheltered employment for the tuberculous in special workshops, and any such development would be sponsored by the corporation set up under section 15 of the Act. The facilities under this section have been interpreted to extend to residential accommodation, such as hostels, village settlements, &c., and therefore the provisions of this section of the Act may be of great service towards the setting up and financing of tuberculosis colonies, village settlements, &c.

The above description of the facilities now becoming available indicates that every type of individual who has any possibility of return to work, and even many in whom that possibility is unlikely, can be helped to obtain education, training, or work by one or other of these schemes. During the war years, when there has been work for all, the machinery of the Ministry of Labour has on the whole worked well; but, as the demand for labour becomes less acute, and with the widened opportunities for the employment of the more or less dis*abled individual, the question arises* whether the machine will work with the same degree of smoothness. Will the D.R.O. really have the breadth of outlook and capacity to appreciate the problems of the tuberculous?

The risk of relapse in tuberculosis is ever present and needs the closest supervision and most careful handling. The D.R.O. is a new kind of specialist in social welfare, and experiment will be needed to decide what qualities, experience, and training are required for such posts. Although the close coöperation of medical superintendents and tuberculosis officers is assured, doctors usually have insufficient knowledge of industry to be able to give a direct lead regarding a patient's ability to perform a specific type of work. On the other hand, industrialists know even less about the requirements of health than doctors know of the requirements of labour.

LARGE FAMILIES

In group 1, as has been shown, there was great inequality in the distribution of the children, and only those who were pregnant before marriage or who married before the age of twenty had large families. The hospital figures underestimate the incidence of large families among the poor, since many multiparæ are reluctant to come into hospital for confinement and leave the other children; hence a large proportion are delivered under the domiciliary scheme. As mentioned earlier, out of 2100 domiciliary cases 18·4% had more than five children and 5% had nine or more children. From the hospital experience we know that these large families are found where the mothers marry young and often after they are already pregnant. It is therefore evident that, if experience in this survey is typical of that of other cities in Scotland, the larger numbers of children found among the poor are not achieved by even distribution, and where large families are found they are not planned. Even the first pregnancy is not planned, and there is little attempt to secure a home until pregnancy has occurred. In these circumstances the wastage of infant life is high, and the health and physique of those who survive are poor. In group 1 of this series the still-birth-rate in a ninth pregnancy was more than twice that of a first pregnancy, and three and a half times that of a second pregnancy. According to Burns (1942), out of 1000 children born alive in county Durham in 1939 the figures for those dying between birth and five years of age were for firsts 85, seconds 93, thirds 99, and for seventh and later children 174. The rates between the end of the first month and five years of age are for first, second, third, and seventh children 50, 62, 70, and 90 respectively.

Yudkin (1944) demonstrated in Cambridge that children from small families were bigger and heavier and had a higher hæmoglobin level and a stronger grip than children from larger families, these differences being greater in the children from poorer areas. The net reproduction-rate in Scotland is not quite unity, even with this large contribution from the poorer sections of the community. In England and Wales the net reproduction-rate is much lower than in Scotland, possibly owing to the fact that there are relatively fewer slums and therefore fewer families living in circumstances where the planning of a family is difficult or impossible. Glass (1938) showed that in 1931 in Durham and Monmouthshire the gross reproduction-rates were 1·275 and 1·140 respectively and the infant mortality-rates high, whereas in Surrey and London the gross reproduction-rates were 0·767 and 0·787 respectively and the infant mortality low.

TABLE VI—RELATIONSHIP IN GROUP 1 BETWEEN AGE AT MARRIAGE, INTERVAL BEFORE BIRTH OF FIRST CHILD, AND SUBSEQUENT NUMBER OF CHILDREN

Subgroup	Age-group at marriage (years)					Total
	Under 20	20–24	25–29	30–34	35 +	
(a) PRENUPTIAL CONCEPTION						
No. of women ..	93	114	33	9	2	251
No. having subsequent pregnancy	65 (*70*)	85 (*74*)	28 (*84*)	6 (*66*)	2	186 (*74*)
No. of subsequent children.. ..	217	215	71	8	5	516
Average no. of subsequent children	3·5	2·5	2·5	1·3	2·5	2·77
(b) CHILD WITHIN A YEAR OF MARRIAGE						
No. of women ..	53	96	28	12	3	192
No. having subsequent pregnancy	27 (*50*)	34 (*35·4*)	14 (*50*)	6 (*50*)	2	83 (*43*)
No. of subsequent children.. ..	98	69	28	12	3	210
Average no. of subsequent children	3·6	2·03	2·0	2·0	1·5	2·5
(c) CHILD BORN MORE THAN A YEAR AFTER MARRIAGE						
No. of women ..	87	182	100	18	18	400
No. having subsequent pregnancy	29 (*33*)	54 (*30*)	32 (*32*)	5 (*27*)	4	124 (*31*)
No. of subsequent children.. ..	54	74	49	7	5	189
Average no. of subsequent children	1·86	1·3	1·5	1·4	1·25	1·5

TABLE VII—RELATIONSHIP IN GROUP 2 BETWEEN AGE AT MARRIAGE, INTERVAL BEFORE BIRTH OF FIRST CHILD, AND SUBSEQUENT NUMBER OF CHILDREN

Subgroup	Age at marriage (years)				
	Under 20	20–24	25–29	30–34	35 +
(b) CHILD WITHIN A YEAR OF MARRIAGE					
No. of women ..	..	34	24	10	6
No. having subsequent pregnancy	..	16 (*47*)	12 (*50*)	3	..
No. of subsequent children	..	27	14	..	..
Average no. of subsequent children..	..	1·7	1·1	..	..
(c) CHILD BORN MORE THAN A YEAR AFTER MARRIAGE					
No. of women ..	3	66	100	51	20
No. having subsequent pregnancy	1	17 (*25*)	28 (*25*)	12 (*23·5*)	2
No. of subsequent children	..	24	39	16	3
Average no. of subsequent children..	..	1·4	1·4	1·3	..

That large families among the poor are not desired can be confirmed by asking women who have had about 10 children how many they would like if they had had the choice. Usually the answer is about 3 or 4. This corresponds to the estimate of the well-to-do mother where the family is carefully planned and where 2 children are all that are usually thought expedient, provided they are of opposite sexes, though many express the opinion that their ideal family would be 3 or 4.

In Britain we have failed so far to raise the net reproduction-rate to unity and at the same time maintain good standards of health. In the areas or social classes where the health statistics are fairly good the reproduction-rate is much less than 1, and in the areas or social classes where the reproduction-rate is 1 or near it, the mortality figures are high and the general standard of health is poor. It is possible to have a net reproduction-rate above unity and a healthy population, as has been demonstrated in New Zealand and in Holland before 1939. Information is not available about the size of families in these countries, though it is known that health services are of a very high order, and they have very low infant mortality-rates. The high mortality-rates in Scotland are kept up to some extent by the high death-rates among these large families. It has been shown that the large families are found almost entirely among the women who seem incapable of planning their lives. These families include many of the problem group and are the last to take advantage of the educational and public-health facilities available. They show very little initiative and are difficult to influence. Improvements in housing, education, and child welfare, with improved provision for birth-control in this group, will lead to a further fall in the birth-rate and an improve-number of old people. If the decline is allowed to develop it will soon become rapid. Before effective legislation can be introduced to alter the downward trend, more information is needed about the reproductive habits of the population. At the moment we have little knowledge of the size of families, and we do not know the incidence of childless marriage. The Royal Commission on Population therefore recommended that a family census should be taken of a representative sample of the population. There is no doubt that great differences exist between the social classes.

TABLE III—AGE-DISTRIBUTION AT TIME OF MARRIAGE OF WOMEN IN GROUPS 1 AND 2

Group	Age-group (years)						Total no. of women
	Under 20	20–24	25–29	30–34	35–39	40 +	
1*	234 (*27·7*)	392 (*46·4*)	162 (*19·2*)	39 (*4·6*)	18 (*2·1*)	..	845
2*	3 (*0·9*)	100 (*31·8*)	124 (*39·5*)	61 (*19·4*)	18 (*6·7*)	5 (*1·6*)	311

* Number of women

PRESENT INVESTIGATION

The following is a study of two groups: group 1, corresponding more or less to the Registrar-General's social classes III, IV, and V, consists of married women who booked for confinement in hospital; group 2 corresponds to social classes I and II, booked to be confined in a nursing-home. In group 1, 41% were primiparæ and 8·3% had already had more than five children. In a group of 2100 women of the same social class delivered under the domiciliary scheme only 19·2% were primiparæ, 18·4% had had more than five children, and 4·8% had already had nine or more children. Combining these two groups in their proper proportions we find that 11·6% had had more than five children. In group 2, 66% were primiparæ and none had had more than five children. In this area no woman in this social class was confined at home.

Great differences in the reproductive habits were found. First, the *illegitimate birth-rate* in the area is about 8%, and practically all these births occur in the same social group as group 1. Table III shows the difference in *age at the time of marriage*. In group 1, 27·7% married before the age of twenty, whereas in group 2, only 0·9% were married before twenty; 74·1% in group 1 and 32·7% in group 2 were married before the age of twenty-five.

In group 1 *prenuptial conception* took place in 29·8% of the total. In women under twenty at the time of marriage it took place in 39·7% of cases (table IV). In group 2 there were no examples of prenuptial conception.

TABLE IV—DISTRIBUTION OF PRENUPTIAL CONCEPTION IN GROUP 1 AND ANALYSIS OF POSTMARITAL CONCEPTIONS

—	Age-group at marriage (years)				
	Under 20	20–24	25–29	30 +	Total
Prenuptial conceptions	93 (*39·7*)	114 (*29·1*)	33 (*20·3*)	11 (*23·9*)	251 (*29·8*)
INTERVAL BETWEEN MARRIAGE AND FIRST CHILD					
Less than 1 year ..	54 (*38·3*)	96 (*34·5*)	28 (*21·7*)	15 (*32·6*)	193 (*32·4*)
Less than 2 years ..	52 (*36·8*)	92 (*33·1*)	47 (*36·3*)	14 (*30·4*)	205 (*34·5*)
Less than 3 years ..	16 (*11·3*)	40 (*14·3*)	18 (*13·9*)	5 (*10·8*)	79 (*13·3*)
Less than 4 years ..	9 (*6·3*)	22 (*7·8*)	10 (*7·7*)	3 (*6·5*)	44 (*7·4*)
More than 4 years ..	10 (*7·1*)	28 (*10·1*)	26 (*20·1*)	9 (*19·1*)	73 (*12·2*)
Total ..	141	278	129	46	594

In group 1, where conception took place after marriage, it was found that the younger the patient at the time of marriage the sooner she became pregnant (table IV). The percentage of the total in each age-group having a child within a year of marriage decreases till the age of thirty; over that age 32% had a child within a year of marriage, possibly because there was then less economic reason for delaying conception. On the other hand, 19·1% of those over thirty years of age did not have a child till more than four years after marriage, compared with 7·1% in the age-group under twenty, possibly indicating diminished fertility in the older women. When groups 1 and 2 are compared, we find no significant difference in the length of time between marriage and the birth of the first child in the age-groups from twenty to twenty-four and from twenty-five to twenty-nine (table V).

TABLE V—AGE AT MARRIAGE AND INTERVAL BETWEEN MARRIAGE AND BIRTH OF FIRST CHILD IN GROUP 2

—	Age-group (years)				Total
	Under 20	20–24	25–29	30 +	
INTERVAL BETWEEN MARRIAGE AND FIRST CHILD					
Less than 1 year	..	34 (*34·0*)	24 (*19·3*)	15 (*17·8*)	73 (*23·4*)
Less than 2 years	1	37 (*37·0*)	48 (*38·7*)	32 (*38·0*)	118 (*37·9*)
Less than 3 years	1	11 (*11·0*)	16 (*12·9*)	16 (*19·0*)	44 (*14·1*)
Less than 4 years	..	7 (*7·0*)	14 (*11·3*)	9 (*10·7*)	30 (*9·6*)
More than 4 years	1	11 (*11·0*)	22 (*17·7*)	12 (*14·2*)	46 (*14·8*)
Total ..	3	100	124	84	311

With regard to subsequent pregnancies, the younger the patient at the time of marriage and the shorter the interval before the first birth, the greater the number of subsequent children. For example, in group 1 (see table VI), among those not pregnant before marriage but having a child within a year of marriage (*b*), 43% had had subsequent children at the time of inquiry. In the age-group under twenty the average number of subsequent children was 3·6, and in the age-group from twenty to twenty-four it was 2·03. When the first child was born more than a year after marriage (*c*), 31% had subsequent children, and the average number of subsequent children was 1·86 in the youngest age-group and 1·3 in the age-group from twenty to twenty-four. In the prenuptial-conception subgroup (*a*) 74% had subsequent children, and in the youngest age-group the average number was 3·5, and in the age-group from twenty to twenty-four 2·5. In both (*a*) and (*b*), of the women who marry before the age of twenty and have further children beyond the first, 27% have more than five children; whereas, when marriage takes place in the age-group from twenty to twenty-four only 11·5% of those having subsequent children in group (*a*) have more than five children; in subgroup (*b*) the percentage is very small.

In group 2, table VII shows that, no matter at what age marriage takes place or what the interval between marriage and the birth of the first child, the average number of subsequent children in no instance reached 2. Actually only 6 out of 78 women having subsequent children have 3 other children at the time of observation.

It has been calculated that, to keep the net reproduction-rate about unity, each married woman who is able would require to have 3 or 4 children. At the time of observation the 845 women in group 1 had an average of 2·06 children each; in group 2, 311 women had an average of 1·4 children. In group 1 this was made up of 393 women (46% of the total) having 2·3 subsequent children after the first. In group 2, 91 women (29% of the total) had 1·35 subsequent children.

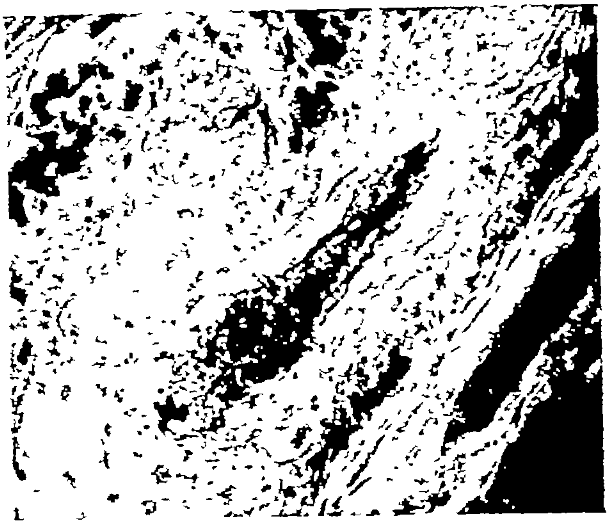


Fig. 2—*D. folliculorum* with head and thorax lying in sebaceous gland, and abdomen extending out into sebaceous gland duct (case 11). Frozen section, Bielschowsky-Gros staining. Outline of parasite much more obvious, and paired legs visible. Reduction of silver has given rise to small black deposits on surface of parasite. (×300.)

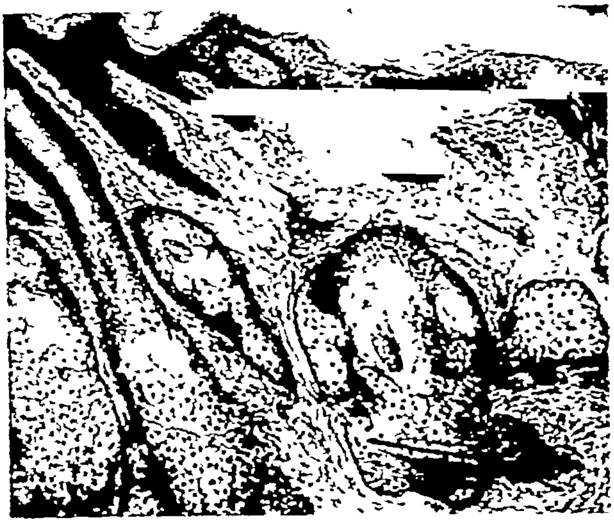


Fig. 3—Three parasites in one field, which shows several sebaceous gland lobules (case 1). Prep. as fig. 2. One parasite in sebaceous gland in centre of field is cut longitudinally; another in gland left centre is cut in an obliquely transverse plane; another in duct passing to left upper corner is cut longitudinally. (×75.)

Andrews (1938) notes that this parasite usually infects the sebaceous glands of the face and that it is not infrequent in coarse oily skins. He says that it is not found in infants, and that, though it is generally considered harmless, facial hyperpigmentation and pustules have been ascribed to it. The finding of these parasites in large numbers in many cases of rosacea may have some ætiological significance. It has also been suggested that the chronic irritation set up by it may be important in the production of epitheliomata.

The significance of its prevalence in the sebaceous glands of the nipple in this short series cannot be assessed without further investigation over wider areas. The penetration of the parasite deep into the sebaceous glands in some instances and the subsequent round-cell infiltration certainly can lead to an area of lowered resistance on the skin surface. The subjection of such an area to the degree of suction described by Gunther (1945) may lead to the breaking down of the epithelium at this point and be a contributing factor in the production of sore nipples. This seems worthy of further investigation.

The fact that it has been thought that its presence in the sebaceous glands of the face has little pathological significance does not mean that the same is true of the sebaceous glands of the nipple, in view of the degree of stimulation which this area receives during suckling.

It is not suggested that the presence of the parasite here is of real importance in the pathogenesis of carcinomatous change in the epithelium of the nipple as in Paget's disease.

SUMMARY

In ten out of thirteen cases *Demodex folliculorum* has been found in the sebaceous glands of the human female nipple.

Evidence of a response to irritation by the parasites lying deep in the gland has been found in the presence of round-cell infiltrations.

Its relevance as a factor in the incidence of sore nipples has been suggested.

My thanks are due to the surgeons and pathologists who have so kindly assisted in the collection of the material, to Prof. E. P. Cathcart, at whose suggestion the wider study was instituted, and to Mr. F. W. Gairns for the very high standard of technical assistance.

REFERENCES

Andrews, G. C. (1938) *Diseases of the Skin for Practitioners and Students*, Philadelphia and London, 2nd ed., pp. 259, 532.
Brumpt, E. (1936) *Précis de parasitologie*, Paris, vol. II, p. 1108.
Cathcart, E. P., Gairns, F. W., Garven, H. S. D. (1946) in preparation.
Fantham, H. B., Stephens, J. W. W., Theobald, F. V. (1916) *The Animal Parasites of Man*, London, pp. 522, 708.
Gunther, M. (1945) *Lancet*, ii, 590.
Jakowski, S. M. (1889) abstracted in *Jber. Anat. Physiol.* 9, 275.
Simon, G. (1843) *Arch. Med. comp.* 1, 45 (cited by Fantham et al., op. cit. p. 823).

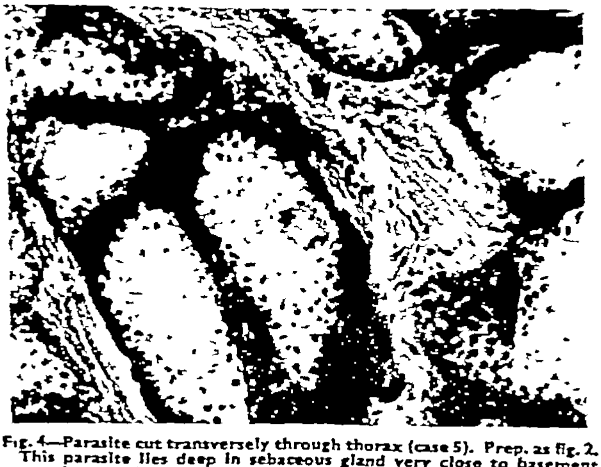


Fig. 4—Parasite cut transversely through thorax (case 5). Prep. as fig. 2. This parasite lies deep in sebaceous gland very close to basement membrane. (×160.)

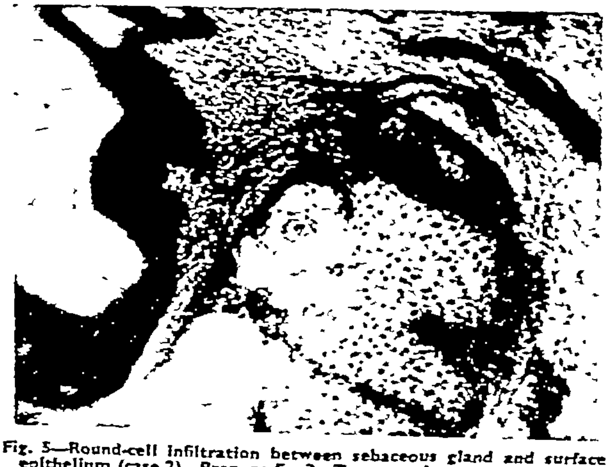


Fig. 5—Round-cell infiltration between sebaceous gland and surface epithelium (case 2). Prep. as fig. 2. Two parasites cut more or less transversely are seen lying in sebaceous gland. (×75.)

ment in the health and physique of those born. The main problem from the point of view of the reproduction-rate is to induce those who at present restrict the size of their family to 1, 2, or 3 to increase it to 3 or 4. The difficulty is largely economic: and, so long as the standard of education and the chance a child gets depend to such a large extent, as now, on the family income, there will be a very strong urge to cut down the size of the family to what the parents calculate they can afford.

REFERENCES

Burns, C. M. (1942) Infant and Maternal Mortality in Relation to Size of Family and Rapidity of Breeding, Newcastle upon Tyne.
Glass, D. V. (1938) In Political Arithmetic (edited by L. Hogben), London
Titmuss, R. M. (1945) In Rebuilding Family Life in the Post-war World (edited by Sir J. Marchant), London
Yudkin, J. (1944) *Lancet*, ii, 384

DEMODEX FOLLICULORUM IN THE HUMAN NIPPLE

H S D. Garven
B.Sc., M.D. Glasg., F.R S E.
From the Institute of Physiology, University of Glasgow

In the course of an extensive study of the structure of the human female nipple, particularly of the nerve terminations (Cathcart et al. 1946), *Demodex folliculorum* has been found in nipples stained by the Bielschowsky-Gros silver method, in which frozen sections are used.

The parasite is often stained by the silver much more deeply than are the surrounding structures; hence it stands out clearly. In other material, with the paraffin method and the usual hæmalum and eosin staining, the parasites can be seen but are much less obvious and consequently difficult to locate and identify. The Ziehl-Neelsen method can also be used; this stains the parasite deep red against the blue background of stained sebaceous matter and sebaceous gland cells.

Material.—This was obtained from five hospitals in or near Glasgow. It has been selected only in so far as the naked-eye appearance was normal and the interval before fixation short. It is important that in this silver method the tissue be fixed soon after death or after the surgical removal of the tissue from the body. The thirteen cases so far stained and investigated by this method are detailed in the accompanying table.

Findings.—Ten of the thirteen cases showed the presence of a parasite corresponding in size and structural details to *D. folliculorum* (syn. *Acarus folliculorum*). As measured in the sections, it is often about 200μ long but may be longer, chiefly as a result of lengthening of the abdomen. It has a short head, eight short legs projecting from the thoracic segments, and a long abdomen with transverse linear striation. The thoracic segments often stain more deeply with the silver than does the abdomen. With the hæmalum staining the general outline of the body is only just visible, for it does not stain deeply; but the deeply stained granules of some of the internal organs are often very clear.

The parasite may be found lying in the sebaceous material in the mouths of the sebaceous glands, with the head directed towards the living cells of the gland (figs. 1–3). In the mouth of the gland, as is readily understandable, it may give rise to little or no reaction in the gland or the surrounding tissues. In many cases, however, it is also found lying deep in the gland among the living cells, with its head very close to or almost touching the basement membrane of the gland (fig. 4). In this situation it may cause some reaction in the tissues surrounding the gland. This is often seen, and a round-cell infiltration of these tissues is common, especially between the gland and the overlying skin epithelium (fig. 5). Small areas of perivascular infiltration are not uncommon in the nipple, but these can be distinguished from those described above.

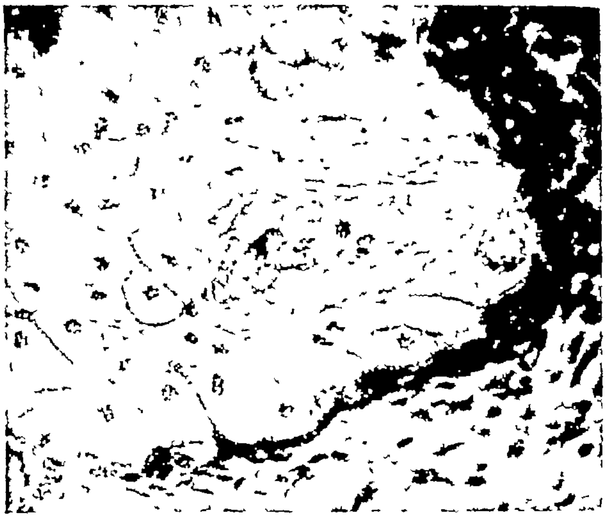


Fig. 1—*Demodex folliculorum* lying in sebaceous gland of nipple (case 2). Paraffin section, hæmalum and eosin. Outline of parasite faint, but some deeply stained granules of internal organs are clearly seen. (×300.)

DISCUSSION

Simon (1843) first discovered this parasite of man in 1842. Jakowski (1880) mentioned the finding of numerous examples of *D. folliculorum* in the mouths of the sebaceous glands of the human nipple.

Fantham et al. (1916), who figure and describe this parasite, state that it is common in the hair follicles, meibomian glands, and sebaceous glands, particularly of the face, nose, lips, and forehead, but may also be present in the skin of the abdomen and in other areas. They suggest that it may be present in 50% of people of all ages, including children. They also mention that it may be present in over 60% of apparently normal borders of the human eyelid. Other varieties occur in the dog, cat, and other animals. They hold that its pathogenicity is not yet proved, though it may be responsible for circumscribed deeply pigmented areas of the skin. The extent to which obstruction of the sebaceous gland ducts of the skin and agglomeration in the meibomian glands are factors in the production of inflammation in comedones and blepharitis is not certain.

Brumpt (1936) gives a similar account of the prevalence of *D. folliculorum* and remarks also on the very large number of parasites which may be present in an individual gland.

CASES OF DEMODEX INFECTION IN SEBACEOUS GLANDS OF THE NIPPLE

Case	Age (yrs)	Source of material	Demodex	Degree of infection	Round-cell infiltration	Remarks
1	39	Mastectomy	Present	Heavy	Present	Carcinoma
2	60	Mastectomy	Present	Heavy	Present	Carcinoma
3	63	Mastectomy	Present	Light	Absent	Carcinoma
4	28	Necropsy	Absent	..	..	No abnormal breast condition
5	42	Necropsy	Present	Heavy	Present	
6	43	Mastectomy	Present	Light	Absent	Carcinoma
7	48	Mastectomy	Present	Light	Absent	Carcinoma
8	35	Mastectomy	Present	Medium	Present	Carcinoma
9	50	Mastectomy	Present	Light	Absent	Carcinoma
10	40	Mastectomy	Absent	..	..	Mastitis
11	45	Necropsy	Present	Heavy	Present	No abnormal breast condition
12	27	Mastectomy	Absent	..	..	Mastitis
13	27	Necropsy	Present	Heavy	Present	No abnormal breast condition

TABLE II—SELECTIVE ACTION OF GRAMICIDIN S ON VARIOUS GRAM-NEGATIVE BACTERIA IN NUTRIENT BROTH. CONCENTRATION, 400 µG. PER ML. OF BROTH. (FROM PERSHINA 1946.)

Organism	No. of strains studied	No. of strains killed	No. of strains not killed
B. dysenteriæ Shiga	15	15	0
,, Flexner	26	24	2
,, Kruse	4	3	1
,, Newcastle	3	3	0
Bact. typhosum	9	0	9
Bact. paratyphosum A	10	3	7
Bact. paratyphosum B, Bact. paratyphosum Breslau, *Bact. enteritidis, Bact. morgani A* and *B* ..	10	0	10

statistical evidence is available on this point. A research committee headed by Prof. N. N. Burdenko, president of the Academy of Medical Sciences of U.S.S.R., has made a careful study in this field, with numerous bacteriological controls and accurately recorded clinical data.

Two groups of 250 persons each, with approximately identical recent wounds, were selected for study. All were given adequate surgical treatment. After this, in the control group, sulphanilamide and other antiseptics of proved value were applied locally with the purpose of preventing suppuration. In the other group an aqueous solution of gramicidin S (400 µg./ml.) was used for the same purpose. It was abundantly applied locally, and irrigation and wet dressings were subsequently repeated two or three times. A comparison of the progress in these two groups gives an idea of the capacity of gramicidin S to prevent suppuration, as compared with other antiseptics now in current use. Table III shows the data for wounds of soft tissues.

As judged by the temperature reaction, 65% of persons treated with gramicidin S (versus 37% of controls) had no suppuration after surgical treatment. Again, there were only 14% of long-lasting suppurations in the gramicidin S group, versus 52% in the controls.

The corresponding data for wounds with bone injuries are given in table IV and show clearly the advantage of using gramicidin S to prevent suppuration. Among other data reported by the same committee is the fourfold decrease of anaerobic infection in the gramicidin S group as compared with controls, and very favourable results obtained in the treatment of empyema with gramicidin S.

TABLE III—ACTION OF GRAMICIDIN S ON WOUNDS OF SOFT TISSUES

Temperature judged by body temperature after treatment		Treated with gramicidin S (%)		Controls (%)	
Normal throughout		29	65	14	37
Fell to normal in—	1– 5 days	36		23	
	6–10 days	21		10	
	11–20 days	11	14	34	53
	21–40 days	3		19	

TABLE IV—ACTION OF GRAMICIDIN S ON WOUNDS WITH BONE INJURIES

Normal throughout		26	46	11	18
Fell to normal in—	1– 5 days	20		7	
	6–10 days	23		25	
	11–20 days	21		32	
	21–40 days	9	10	14	25
	later than 40th day	1		11	

Grach (1945) and Levinson and Belkina (1945) have reported their observations concerning the usefulness of gramicidin S in the treatment of infected wounds. The former reports 215, and the latter report 67 cases. They wholly confirm previous data summarised by Sergiev (1944) and indicate favourable results in the treatment of burns, carbuncles (with incision), and postoperative suppuration. The technique of application of gramicidin S has been already reported by Sergiev (1944).

OTHER APPLICATIONS

Udenich and Dutova (1945) and Marchenko and Rachman (1946) have successfully used gramicidin S in the production of cowpox vaccine. Gramicidin S in a concentration of 800–1600 µg. per ml. of glycerinated pulp rapidly cleans the virus from various contaminating microbes without injuring it. The pulp so prepared is practically free from bacteria at the end of the first week and remains active as long as the control glycerinated pulp prepared without gramicidin S.

REFERENCES

Belozersky, A. N., Passhina, T. S. (1944) *Lancet*, ii, 716.
— — (1945) *Biokhimiya*, 10, 344.
Bulgakov, N., Lasarenko, F. (1945) *Rep. Chkalov Inst. Microbiol.*
Gause, G. F., Brazhnikova, M. G. (1944) *Lancet*, ii, 715.
Grach, J. (1945) *Rep. Chkalov Inst. Microbiol.*
Kashintseva, N. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Krestovnikova, V., Taratorina, O. (1946) *Ibid*, 2.
Levinson, L., Belkina, E. (1945) *Hosp. Works*, 4, 42.
Marchenko, G., Rachman, E. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Pershina, Z. (1946) *Ibid*, 2.
Rodaniche, E. C., Palmer, W. L. (1943) *J. infect. Dis.* 72, 154.
Sergiev, P. (1944) *Lancet*, ii, 717.
Sharkova, M., Brazhnikova, M. G. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Synge, R. L. M. (1945) *Biochem. J.* 39, 363.
Udenich, V., Dutova, N. (1945) *Rep. Chkalov Inst. Microbiol.*
Zurafsky, N. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.

OVARIAN CYSTECTOMY OF TWISTED CYSTS

STANLEY WAY
M.R.C.O.G.
ASSISTANT TO THE DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY, MEDICAL SCHOOL, KING'S COLLEGE, NEWCASTLE-ON-TYNE

IN 1916 Victor Bonney accidentally discovered that ovarian cysts could be enucleated, leaving behind the normal ovarian tissue. This operation he termed "ovarian cystectomy," and its introduction marked a great step forwards in ovarian surgery, for it showed that in young women with bilateral benign ovarian tumours castration could be avoided.

Although Bonney[1] has consistently preached the doctrine of conservative ovarian surgery in young women, it still appears that this operation is not widely practised. Few books and papers on the surgery of the ovary mention it, and some writers have condemned the operation while admitting that they have never performed it. Many have sacrificed the whole of the affected ovary because the disease is unilateral. This is an attitude all too commonly adopted by surgeons in regard to bilateral organs. If a conservative operation can achieve the same results as a radical one it is obviously better, and the choice of the radical operation to save time is a prostitution of the art of surgery.

Such references as there are to this operation either make no mention of its use in cases of twisted ovarian cysts, or they simply state that it cannot be done. My experience with many cases led me to doubt that this statement was correct, and I determined to try to perform it in a suitable case. The object of this paper

---

[1] Bonney, V. *Practitioner*, 1924, 112, 137 ; *Med. J. Aust.* 1928, 1, 741 ; *J. Obstet. Gynæc.* 1937, 44, 1, and 1938, 45, 250 ; *S. Afr. med. J.* 1938, 12, 113, Technical Minutiæ of Extended Myomectomy and Ovarian Cystectomy. London, 1946 (pp. 259-280).

GRAMICIDIN S

REVIEW OF RECENT WORK

G. F. Gause

PROFESSOR OF MICROBIOLOGY, INSTITUTE OF TROPICAL MEDICINE, MOSCOW

The purpose of this article is to summarise some recent experience gained in work with gramicidin S, both along theoretical and clinical lines. Previous data reported by Gause and Brazhnikova (1944), Belozersky and Passhina (1944), and Sergiev (1944) need not be repeated here. Since then important improvements have been made in the large-scale production of gramicidin S in U.S.S.R., so that yields now attain about 3 g. of crystalline material per litre of the nutritive medium; the study of the chemistry of gramicidin S, mainly by Synge and his colleagues in Great Britain, has revealed an unexpected simplicity in its composition; and numerous statistical data have been collected in U.S.S.R. concerning the efficiency of its application to human therapy. Gramicidin S has also been forwarded to Australia and is being used in military hospitals in the tropical region under the supervision of Dr. N. Hamilton Fairley. It is hoped that similar studies in this field will be undertaken in other countries.

PRODUCTION AND CHEMISTRY

The organism producing gramicidin S is now identified as a new subspecies, *Bacillus brevis* var. Gause-Brazhnikova, by Sharkova and Brazhnikova (1946). Its relation to *Bacillus brevis* Bergey is given in table I.

The inability of Russian strains to liquefy gelatin and hydrolyse starch is remarkable, and these differences perhaps surpass the rank of a subspecies. There are now at our disposal several strains of such bacteria isolated from different parts of U.S.S.R., all of them possessing common growth properties and producing the same crystalline gramicidin S. Though both rough and smooth forms of the bacteria produce gramicidin S, only rough variants are selected and used for commercial production. Rough variants sporulate abundantly, whereas smooth variants gradually lose sporulating capacity in subcultures; hence the latter are inconvenient for handling of the cultures. Kashintseva (1946) reports high yields of gramicidin S produced commercially on yeast autolysate with tryptone.

Though gramicidin S, as isolated from the bacterial culture, is a hydrochloride, Belozersky and Passhina (1945) described an easy method of preparing the free peptide in crystalline form. The melting-point of the latter is 245°–257° C. Synge (1945) has reported the important discovery that gramicidin S consists of only five different amino-acid residues: *l*-ornithine, *l*-proline, *l*-valine, *l*-leucine, and *d*-phenylalanine, occurring in unimolecular proportions. As is known, gramicidin (Dubos) and tyrocidine hydrochloride are more complicated. The remarkable simplicity of gramicidin S will probably make it a favourite object in the chemical study of antibiotic peptides.

ACTION ON PATHOGENIC BACTERIA

Pershina (1946), in an extensive investigation, confirmed the much greater efficiency of gramicidin S in killing staphylococci, as compared with tyrothricin, gramicidin, and tyrocidine hydrochloride. What is new in this investigation is the demonstration of selective action of gramicidin S on gram-negative bacteria suspended in nutrient broth. Whereas tyrothricin and its derivatives are inefficient under these conditions, gramicidin S kills many species of gram-negative bacteria but does not affect others. The selective character of its action on this group of bacteria is shown in table II.

It is remarkable that dysentery bacilli are very susceptible to the lethal action of gramicidin S, whereas typhoid and paratyphoid bacilli (with the curious exception of some strains of *Bact. paratyphosum A*) are resistant to the action of gramicidin S. The search for a biochemical foundation of this selective action of gramicidin S seems to be very promising and may lead to important conclusions.

It has also been shown that the lethal action of gramicidin S on gram-positive and gram-negative bacteria is not reduced in the presence of serum of human blood. Krestovnikova and Taratorina (1946) have shown that gramicidin S, in common with tyrothricin (Rodaniche and Palmer 1943), kills enterococci resistant to penicillin and sulphonamides. According to their views, human enterococci play an important part in many septic processes, and their efficient control in wounds is an important task. Zurafsky (1946) has presented conclusive evidence that early local application of gramicidin S prevents anaerobic infection in guineapigs.

Since gramicidin S is manufactured in many cities of U.S.S.R., numerous observations of its action on pathogenic bacteria are scattered in local publications.

TABLE I—SYSTEMATIC POSITION OF BACTERIA PRODUCING GRAMICIDIN S

Characters	*B. brevis* Bergey	*B. brevis* var. Gause-Brazhnikova (producing gramicidin S)		
		1st variant*	2nd variant	3rd variant
Morphology ..	Rod with central spore	Same	Same	Same
Mobility ..	+	+	+	+
Flagellæ ..	Peritrich	Same	Same	Same
Gram's stain ..	+	+	±	±
Gelatin ..	Liquefaction	No growth	No growth	No liquef.
Agar	Thick, white, moist growth	Moderate, yellowish-white growth	Same	Same
Bouillon ..	Film, turbidity, flaky sediment	Same	Same	Same
Glucose, lactose, mannite, sucrose, maltose	No acid or gas	Same	Same	Same
Hydrolysis of starch	+	–	–	–
Indole	–	–	–	–
H_2S	No data	+	+	+
Blood-serum ..	No liquefaction	Liquef.	No liquef.	Liquef.
Optimal temperature	37° C	40°–41° C	40°–41° C	40°–41° C

* Recommended for commercial production.

ACTION ON TISSUES

Bulgakov and Lasarenko (1945) have made a thorough study of the action of gramicidin S, 'Rivanol,' and sulphanilamide on regeneration of experimental non-infected skin wounds in the ox. Eighty wounds were made, treated daily by different antiseptics in the concentrations recommended for clinical use, and regeneration processes examined histologically. They conclude that epithelisation of wounds treated with gramicidin S is somewhat more rapid than in control wounds. At the same time rivanol and sulphanilamide exert an inhibitory action; thus when control wounds had epithelised completely, in wounds treated with rivanol or with sulphanilamide epithelium covers only half of the wound surface.

CLINICAL RESULTS

The prophylactic effect of gramicidin S on suppuration can now be evaluated in objective terms, so far as

TABLE II—SELECTIVE ACTION OF GRAMICIDIN S ON VARIOUS GRAM-NEGATIVE BACTERIA IN NUTRIENT BROTH. CONCENTRATION, 400 µG. PER ML. OF BROTH. (FROM PERSHINA 1946.)

Organism	No. of strains studied	No. of strains killed	No. of strains not killed
B. dysenteriæ Shiga	15	15	0
„ Flexner	26	24	2
„ Kruse	4	3	1
„ Newcastle	3	3	0
Bact. typhosum	9	0	9
Bact. paratyphosum A	10	3	7
Bact. paratyphosum B, *Bact. paratyphosum* Breslau, *Bact. enteritidis*, *Bact. morgani A* and *B* ..	10	0	10

statistical evidence is available on this point. A research committee headed by Prof. N. N. Burdenko, president of the Academy of Medical Sciences of U.S.S.R., has made a careful study in this field, with numerous bacteriological controls and accurately recorded clinical data.

Two groups of 250 persons each, with approximately identical recent wounds, were selected for study. All were given adequate surgical treatment. After this, in the control group, sulphanilamide and other antiseptics of proved value were applied locally with the purpose of preventing suppuration. In the other group an aqueous solution of gramicidin S (400 µg./ml.) was used for the same purpose. It was abundantly applied locally, and irrigation and wet dressings were subsequently repeated two or three times. A comparison of the progress in these two groups gives an idea of the capacity of gramicidin S to prevent suppuration, as compared with other antiseptics now in current use. Table III shows the data for wounds of soft tissues.

As judged by the temperature reaction, 65% of persons treated with gramicidin S (versus 37% of controls) had no suppuration after surgical treatment. Again, there were only 14% of long-lasting suppurations in the gramicidin S group, versus 52% in the controls.

The corresponding data for wounds with bone injuries are given in table IV and show clearly the advantage of using gramicidin S to prevent suppuration. Among other data reported by the same committee is the fourfold decrease of anaerobic infection in the gramicidin S group as compared with controls, and very favourable results obtained in the treatment of empyema with gramicidin S.

TABLE III—ACTION OF GRAMICIDIN S ON WOUNDS OF SOFT TISSUES

Temperature judged by body temperature after treatment		Treated with gramicidin S (%)		Controls (%)	
Normal throughout		29	65	14	37
Fell to normal in—	1– 5 days	36		23	
	6–10 days	21		10	
	11–20 days	11	14	34	53
	21–40 days	3		19	

TABLE IV—ACTION OF GRAMICIDIN S ON WOUNDS WITH BONE INJURIES

Normal throughout		26	46	11	18
Fell to normal in—	1– 5 days	20		7	
	6–10 days	23		25	
	11–20 days	21		32	
	21–40 days	9	10	14	25
	later than 40th day	1		11	

Grach (1945) and Levinson and Belkina (1945) have reported their observations concerning the usefulness of gramicidin S in the treatment of infected wounds. The former reports 215, and the latter report 67 cases. They wholly confirm previous data summarised by Sergiev (1944) and indicate favourable results in the treatment of burns, carbuncles (with incision), and post-operative suppuration. The technique of application of gramicidin S has been already reported by Sergiev (1944).

OTHER APPLICATIONS

Udenich and Dutova (1945) and Marchenko and Rachman (1946) have successfully used gramicidin S in the production of cowpox vaccine. Gramicidin S in a concentration of 800–1600 µg. per ml. of glycerinated pulp rapidly cleans the virus from various contaminating microbes without injuring it. The pulp so prepared is practically free from bacteria at the end of the first week and remains active as long as the control glycerinated pulp prepared without gramicidin S.

REFERENCES

Belozersky, A. N., Passhina, T. S. (1944) *Lancet*, ii, 716.
— — (1945) *Biokhimiya*, 10, 344.
Bulgakov, N., Lasarenko, F. (1945) *Rep. Chkalov Inst. Microbiol.*
Gause, G. F., Brazhnikova, M. G. (1944) *Lancet*, ii, 715.
Grach, J. (1945) *Rep. Chkalov Inst. Microbiol.*
Kashintseva, N. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Krestovnikova, V., Taratorina, O. (1946) *Ibid*, 2.
Levinson, L., Belkina, E. (1945) *Hosp. Works*, 4, 42.
Marchenko, G., Rachman, E. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Pershina, Z. (1946) *Ibid*, 2.
Rodaniche, E. C., Palmer, W. L. (1943) *J. infect. Dis.* 72, 154.
Sergiev, P. (1944) *Lancet*, ii, 717.
Sharkova, M., Brazhnikova, M. G. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.
Synge, R. L. M. (1945) *Biochem. J.* 39, 363.
Udenich, V., Dutova, N. (1945) *Rep. Chkalov Inst. Microbiol.*
Zuratsky, N. (1946) *J. Microbiol. epidem. U.S.S.R.* 2.

OVARIAN CYSTECTOMY OF TWISTED CYSTS

STANLEY WAY
M.R.C.O.G.

ASSISTANT TO THE DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY, MEDICAL SCHOOL, KING'S COLLEGE, NEWCASTLE-ON-TYNE

IN 1916 Victor Bonney accidentally discovered that ovarian cysts could be enucleated, leaving behind the normal ovarian tissue. This operation he termed "ovarian cystectomy," and its introduction marked a great step forwards in ovarian surgery, for it showed that in young women with bilateral benign ovarian tumours castration could be avoided.

Although Bonney[1] has consistently preached the doctrine of conservative ovarian surgery in young women, it still appears that this operation is not widely practised. Few books and papers on the surgery of the ovary mention it, and some writers have condemned the operation while admitting that they have never performed it. Many have sacrificed the whole of the affected ovary because the disease is unilateral. This is an attitude all too commonly adopted by surgeons in regard to bilateral organs. If a conservative operation can achieve the same results as a radical one it is obviously better, and the choice of the radical operation to save time is a prostitution of the art of surgery.

Such references as there are to this operation either make no mention of its use in cases of twisted ovarian cysts, or they simply state that it cannot be done. My experience with many cases led me to doubt that this statement was correct, and I determined to try to perform it in a suitable case. The object of this paper is to describe the technique and results obtained in 15 cases in which I have enucleated a twisted ovarian cyst.

---

[1] Bonney, V. *Practitioner*, 1924, 112, 137; *Med. J. Aust.* 1928, 1, 741; *J. Obstet. Gynæc.* 1937, 44, 1, and 1938, 45, 250; *S. Afr. med. J.* 1938, 12, 113, Technical Minutiæ of Extended Myomectomy and Ovarian Cystectomy. London, 1946 (pp. 259-290).

Before describing the method it is necessary to mention the observations which led me to conclude that this operation was possible. I noted in operating on certain ovarian cysts that the pedicle was loosely twisted, sometimes more than once, yet there was no infarction, because the twists were not sufficiently tight to cause either venous or arterial obstruction. Nearly all these patients had vague lower abdominal discomfort, or sometimes recurrent attacks. On the other hand there was the type of patient admitted as an emergency case because of an attack of severe colicky pain, often associated with vomiting. When the abdomen was opened in this type of case infarction was always seen, although its degree varied with the length of time that symptoms had been present. Of 120 such patients 119 gave a history of lower abdominal discomfort or pain before the severe attack, and in some cases these symptoms had been present for some months. It appears, then, that the mild recurrent nagging pain in these cases is due to torsion without infarction, but the severe symptoms presented by the typical "twisted ovarian" are due to infarction. I reasoned that, if the significance of these findings was appreciated, cysts that were threatened with total infarction could be recognised before this catastrophe took place and while there was still time to conserve ovarian tissue; and that, if infarction had taken place, it might still be possible to intervene before serious intravascular clotting affected the main ovarian vessels.

TECHNIQUE

There appeared to me to be a similarity between a twisted ovarian cyst and a knuckle of gut strangled in a hernial sac or between bands. In the latter case, where there is doubt about the viability of the bowel it is usual after releasing it to cover it with hot packs and to observe it for change of colour and the appearance of peristalsis. If it becomes pink and movement returns, it is considered viable; but should it remain black and motionless resection is indicated. It was easy to adapt this technique to the infarcted ovarian cyst. First its pedicle was untwisted, and then it was covered with hot packs and its colour watched. If it regained its normal colour, I concluded that ovarian cystectomy could be carried out.

In the first four cases that I saw after planning this technique the patients were over 50 years of age, and therefore there was no point in conserving the ovary. Before removing these tumours, however, I tested my theory, and in three of the four, as soon as the twists were undone, the colour, which had been very dark red, at once began to lighten and after some minutes was nearly normal. In the fourth case it was not until hot packs had been applied that any return to normality was noted, but after 10 minutes this cyst was almost bright pink. The colour change first appeared at the fimbriated end of the tube, and I have since used this as a guide.

The first case that I encountered in a young woman had shown symptoms of infarction for at least four days, and at operation I observed no colour change after surrounding the tumour with hot packs for 10 minutes. The second patient was a girl, aged twenty-three, who was two months' pregnant. She was admitted to hospital with symptoms of torsion and infarction of an ovarian cyst of twelve hours' duration. At operation I found a right twisted ovarian cyst, the size of a Jaffa orange, lying behind the pregnant uterus. It was dark blue, with black patches scattered over its surface. I untwisted the cyst and applied hot packs to it. At once it began to regain its normal colour. I identified the normal ovarian tissue at the apex of the pedicle and resected the tumour. By the time the ovary had been sutured it was normal in colour. The cyst was a benign follicular cyst containing a large corpus luteum. As was expected, the patient aborted on the tenth day after operation.

RESULTS

I have now performed ovarian cystectomy in 15 cases of twisted ovarian cyst; 2 of these patients had only one ovary at the time of operation, and 1 of them has since become pregnant; 4 were pregnant when the operation was performed. In the case described above, abortion followed the removal of the corpus luteum in early pregnancy. In the other 3 no corpus luteum was seen in the removed portion of ovary, and abortion did not take place. In 1 of the pregnant patients the pedicle was twisted seven times, and the fallopian tube was badly-constricted at the point of torsion. I did not remove it, but I wondered if some permanent damage might have been done, and if the constriction would remain and possibly become the seat of an ectopic gestation later. Six weeks after delivery I admitted the patient to hospital and performed a salpingography. The affected tube showed no deformity and was readily patent, looking exactly like the tube on the opposite side. The recovery of 1 patient was delayed by postoperative pneumonia; the others made an uninterrupted recovery, except the patient who aborted. I reopened this patient's abdomen eighteen months later, when I performed a cæsarean section for placenta prævia in her second pregnancy. The affected ovary was slightly smaller than the one on the other side, but appeared normal and had many follicles on its surface. There were no adhesions, although a thickened white line, which I took to be my suture line, was visible on the surface of the ovary. All 15 patients have been followed up for various lengths of time; 4 have become pregnant, and the others all menstruate normally, although 1 had six months' amenorrhœa after the operation.

The cysts were 3 simple cysts of follicular origin, 4 dermoids, and 8 multilocular cystadenomas. The largest cyst weighed 8 lb.

The key to success is early diagnosis and early operation, but even unfavourable-looking tumours may be amenable to conservative surgery.

SUMMARY

A technique is described for performing ovarian cystectomy on certain twisted ovarian tumours.

The results of 15 such operations are given.

I am indebted to Prof. E. Farquhar Murray and Mr. H. Harvey Evers for allowing me to operate on cases admitted under their care.

HERNIA THROUGH THE FORAMEN OF WINSLOW

REPORT OF A CASE

LEON GILLIS

M.B. Witwatersrand, M.Ch. Orth. Lpool, F.R.C.S., F.R.C.S.E., D.L.O.

SENIOR SURGEON, QUEEN MARY'S HOSPITAL, ROEHAMPTON

A SURVEY of the literature shows that hernia of the foramen of Winslow is rare and has a very high mortality. There appear to be two forms: in one the hernia passes into the foramen of Winslow and remains in the lesser sac; in the other it re-enters the peritoneal cavity through the gastrohepatic omentum. Either the small intestine or the large intestine may enter the foramen of Winslow.

This condition has been reviewed by Silverstone (1939) and by Edwards and Stewart (1943). The present case may throw some light on both the predisposing factors and the anomalies which are said to exist.

A rigger, aged 41, was admitted to the Birkenhead Municipal Hospital at 9 P.M. on Sept. 9, 1941, with a history that he had been seized with a sudden severe pain in the epigastrium while at stool at 2 P.M. that afternoon. The pain was sharp and continuous, did not radiate, and had not altered in character since onset. He had vomited four times before admission. He had no previous history of any digestive upset. His bowels had always been regular and there were no urinary symptoms.

On examination he was very shocked and obviously in great pain. There was tenderness in the epigastrium and some guarding, but no rigidity. No free fluid could be determined. The central nervous and cardiovascular systems showed no abnormality. He had some bronchitis. Temperature 98° F, pulse-rate 60. Acute intestinal obstruction or perforation was tentatively diagnosed.

Operation.—Under general anæsthesia the patient was operated on at 10 P.M. The peritoneal cavity was opened through a midline incision. There was some bloodstained fluid present in the peritoneal cavity. No perforation could be found, but there was an unusual band running across the posterior abdominal wall, towards the right hypochondrium. This consisted of small intestine with its mesentery. As this was abnormal anatomically, the question arose whether this was not some form of transposition of the viscera. Further investigation showed that it was an internal hernia into the foramen of Winslow.

The anatomical boundaries of the foramen of Winslow preclude active dissection, but nevertheless it is surprising how much this opening can be enlarged, without injury to any of the large structures which surround it. The bowel could be coaxed back into the greater sac by stretching the foramen of Winslow with the fingers, by pressure on the gastrohepatic omentum, and by gentle traction on the entering loop.

The loop, when reduced, was found to be about 18 in. of jejunum; it was purple and frayed but not devitalised. The proximal loops were distended, and the distal loops were collapsed. Resuscitative measures with warm towels improved the bowel, except for an area about the size of a shilling in the mesentery, which was black. As this was some distance away from the mesenteric surface of the bowel, it was replaced in the peritoneal cavity.

The patient made an uninterrupted recovery and is quite well to date.

This case again demonstrates the paradoxical pulse-rate previously described in this condition: the rate never rose above 80 per min. and was generally about 60.

The history of sudden pain while at stool suggests that the increase of intra-abdominal pressure allowed the small intestine, attached to an abnormally long mesentery, to be driven into the foramen of Winslow, which must have been open and not a closed slit, and that about 18 in. of small intestine could accommodate itself in the lesser sac, without passing through the gastrohepatic omentum.

According to Silverstone (1939), Moynihan and Dobson (1906) suggested that at least one of the following anomalies existed and acted as a predisposing factor: (1) a common mesentery for the whole of the intestine; (2) the absence of secondary fusion of the ascending colon to the posterior abdominal wall; (3) an abnormally large foramen (the normal foramen usually admits the index finger and occasionally the index and middle fingers); or (4) an abnormally long mesentery allowing undue mobility of the intestine.

REFERENCES

Edwards, H., Stewart, W. (1943) *Brit. med. J.* i, 343.
Moynihan, B. G. A., Dobson, J. F. (1906) Retroperitoneal Hernia, 2nd ed., London.
Silverstone, M. (1939) *Lancet*, ii, 786.

"... No branch of science or art furnishes a more striking example than does medicine of the fact that increasing specialisation is necessarily accompanied by increasing interdependence and coöperation among the specialised fields. In the early days all the sciences were combined together, frequently in the same individual. Later the various specialties had a tendency to run their separate courses. Now we find them coming together again for mutual support. It is something like the story of the prodigal son, who, after the adventures of an independent career, is glad to come back again to his family."—KARL T. COMPTON, *J. Amer. med. Ass.* 1946, 131, 77.

Medical Societies

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever group on June 14, with Dr. M. MITMAN, the president, in the chair, a discussion on

Pertussis Prophylaxis and Control

was opened by Dr. H. J. PARISH (Wellcome Physiological Research Laboratories). Whooping-cough, he said, is the most serious of the acute specific infections of childhood; in England and Wales it causes at least 2000–3000 deaths annually, of which 90% are in children under five years. Dissatisfaction with the results of specific prophylaxis is indicated by the variety of vaccines and doses employed by different investigators; and research is hampered by the lack of a good laboratory test. Vaccines are prepared today from virulent phase I organisms, either on Bordet-Gengou blood-agar or on modified Hornibrook liquid medium; the suspensions can be precipitated with alum and washed in saline or buffer solution. Clinical evidence of their efficacy is equivocal.

H. Proom, in work shortly to be published, has obtained low-grade protection with vaccines (made with or without alum precipitation) in mice challenged with living culture intraperitoneally. Antibacterial serum is also relatively ineffective, but antitoxic serum, from horse or rabbit, protects mice against intraperitoneal infection. This supports the view that the death of the control mice is due to a toxin, which can be prepared from frozen and thawed, dried and ground bacilli; on the other hand, the existence of some antibacterial immunity following phase I vaccination is suggested by a pronounced reduction in the number of organisms in the blood of mice infected by the intraperitoneal route. Unwashed phase IV vaccines have a negligible effect.

The rôle of the toxin in human infection is uncertain, but there is some evidence that it assists the organisms to invade the tissues. However, it is noteworthy that so far no antitoxin has been demonstrated in convalescent sera.

When virulent *Hæmophilus pertussis* is injected into mice intranasally, pneumonia is set up; the bacteria multiply in the lung for a fortnight and then gradually die out. The value of vaccine against this intranasal infection is demonstrated both by some increase in the survival-rate of the vaccinated group of animals and by a reduced bacterial count in the lung. Antibacterial and antitoxic sera also control the lung infection, bacterial counts being often nil. A highly potent antibacterial and antitoxic horse-serum is now on clinical trial, but the results have so far been disappointing.

Thus, extensive experiments in mice and collateral clinical evidence indicate that no form of specific immunisation is likely to be very effective against whooping-cough. In mice the protection is erratic; in man also it is variable and at best of low grade. Research on the problem of the control of pertussis is complicated by the lack of uniformity of the cases and the difficulties of clinical and bacteriological diagnosis. The sulphonamides and penicillin have been used more or less indiscriminately, principally to control the secondary invaders, and streptomycin is now on trial.

THE CLINICAL SIDE

Dr. W. GUNN did not think it essential that the worth of the antigen should be proved before large-scale immunisation is undertaken. In whooping-cough, where infectivity is very variable and for which there is no reliable test of immunity, only investigation on a large scale can furnish the answer sought. If given an explanation, few parents would refuse to have whooping-cough antigen combined with diphtheria A.P.T. in the same injection. Reactions are no greater than when each antigen is given singly and, far from interfering with one another, each may enhance the immunising properties of the other. It is, however, preferable to begin injections at 5–6 months or even earlier and not at 9–12 months as is more usual in diphtheria prophylaxis. Two or three injections (depending on the reaction to the first) at intervals of 4 weeks, given into the deltoid or vastus externus, constitute the course; a single injection of the combined antigen is desirable on first attendance at school. Dr. Gunn has used combined A.P.T. and alum-treated whooping-cough vaccine without untoward effect, but as the inoculated group were all nursery children who shortly afterwards were transferred outside London, follow-up inquiries were difficult. Standardised records, which accompany the children as do ration books and identity cards, are essential for a proper statistical investigation. Special examinations, such as slide-agglutination and complement-fixation tests, should be made at intervals on random samples of the immunised as well as of the controls, since latent immunisation may give unduly flattering results.

The urgent need for active immunisation should not blind one to other measures of control. Isolation by itself can do little good since the damage is usually done by the time the diagnosis is made, though with white-cell counts and nasopharyngeal swabs the condition may be diagnosed before the onset of the whoop ; human or rabbit hyperimmunised serum may prevent or attenuate an attack in known contacts or help in early or severe cases. Active immunisation may be started at the same time, as in diphtheria control, if the risk of the disease is grave ; and in the very young the risk is always grave.

PREPARATION AND USE OF VACCINE

Dr. J. UNGAR (Glaxo Laboratories) said that in four years' investigation attention was ultimately concentrated on an alum-precipitated vaccine which produced good antigenic activity in animals; preliminary clinical trials showed that the vaccine, properly administered, is innocuous. The total dose recommended in successful tests in the U.S.A. was about 100,000 million for Sauer's vaccine, or 30,000–40,000 million for alum-precipitated vaccine. The interval recommended is 3–4 weeks.

Animal tests serve to determine (1) the virulence of the strain to safeguard the full antigenic value of the vaccine, and (2) the effectiveness of the antigenic action of different products. Some workers use mice, employing either the intranasal, intratracheal, or intracerebral route for testing the effect of live cultures, and the intraperitoneal route for testing the toxic effect. The rabbit seems to be a more reliable test animal, on which both components of vaccines—antibacterial and antitoxic—can be evaluated. But combined tests on mice and rabbits will help to differentiate between effective and less effective vaccines. More evidence is needed to show the rôle of pertussis toxin in the pathology of experimental pertussis in animals and the usefulness of including the toxic fraction in vaccines. The pertussis toxin differs in some respects from the usual exotoxins, and the clinical value of the antitoxic serum has still to be proved. Laboratory evidence indicates that the toxic fraction in live bacilli has a specific effect in animals which is counteracted by injection of antitoxin.

It is now recognised, said Dr. Ungar, that the optimal time to immunise is in the first half-year of life, preferably at the age of 5–7 months ; it takes about 3 months for the immunity to be well established, depending on the type of vaccine and the intervals between doses. In the U.S.A. prophylactic treatment has been found to confer complete or partial immunity such as may follow whooping-cough. Serum treatment (convalescent, hyperimmune, or animal) has proved valuable in prophylaxis of contacts in the first 6–7 days of the incubation period.

Reviews of Books

The X-ray Treatment of Accessible Cancer

D. WALDRON SMITHERS, M.D., D.M.R., director of radiotherapy departments of the Royal Cancer Hospital (Free) and the Royal Free Hospital. London : Edward Arnold. Pp. 147. 40*s*.

Dr. Waldron Smithers sets out to discuss accessible cancer and its treatment with X rays of limited penetration. He gives a detailed description of the good use which has been made of short-distance low-voltage "contact" X-ray therapy at the Royal Cancer Hospital, and discusses the biological effects of this radiation. The first chapter deals shortly with the problems of treatment, and the second passes at once to a full and well-illustrated description of the two types of apparatus which may be used : the Philips 45 kV. apparatus and the Siemens 60 kV. monopan apparatus, originally used by Chaoul, whose name has been associated with the method since its first introduction to this country. Other apparatus for treatment at higher voltages is also included, but throughout the book emphasis is on the "contact" method.

Between 1935 and 1943, 320 cases of squamous carcinoma of the skin were treated, and the symptom-free rate at three years is 69 %. The number of cases of basal-cell carcinoma is larger (654), but the tumour is so much easier to cure in its early stages that the results are less important. Cancer of difficult sites such as the lip, ear, and eyelids requires ingenious planning of radiotherapy, and some clever devices are illustrated here, accompanied by useful dose-distribution diagrams for two directly opposing fields of X rays at 60 kV. For cancer of the mouth special intra-oral apparatus is needed and some good results are illustrated in photographs, but the numbers treated are too small for comparison with other methods. A special chapter discusses the mode of action of radiation on malignant cells and the possibility of making a quantitative analysis by cell-counts, which would guide the radiotherapist in choosing dosage for subgroups within the accepted pathological classification of tumours. This promising work is still in too early a stage to be allowed to influence the treatment of patients.

Descriptions of method are uniformly good, but the attempt to discuss all the accessible cancers—whether they are suitable for these methods or not—is rather confusing ; for instance, cancer of the cervix, which should not be treated by "contact" methods, really deserves no place in this book. However, no radiologist will fail to secure a book which provides him with so much valuable information in a form reminiscent of the best pre-war publications.

Post War Britain

Editor : Sir JAMES MARCHANT, K.B.E., LL.D., F.R.S.E., with an introduction by Lord WOOLTON. London : Eyre and Spottiswoode. Pp. 240. 12*s*. 6*d*.

THIS is a series of essays by eleven experts in their own subjects, ranging from health to the organisation of scientific research, of which those on health by Lord Horder, on food by Sir John Orr, and on housing by Sir Ernest Simon will be of interest to the medically minded. Lord Horder's essay, of course very attractively written, ends with the assurance that the adventure for health is well worth while, though man is wilful and inconstant. "Before this quest for Health, therefore, looms the 'Diagnosis of Man,' and with that also we must deal if we wish to arrive at our goal." Sir John Orr's thesis is that only by international action can we feed the world satisfactorily and fulfil the promise of the Atlantic Charter and the recommendations of Hot Springs ; he too is hopeful. Sir Ernest Simon's contribution is crammed with information of value in the practical aspects of financing a housing scheme. He points out that interest and amortisation between them account for the major part of any subsidy. If the interest on borrowed money could be cut down to 1½ % it would "from the point of view of securing low-rented houses represent by far the most important single contribution that the Government could make." He, like the others, is hopeful, and with the low rate offered in Exchequer Bonds 1950 for the conversion of Government loans maturing 1945–49 we may be hopeful too.

Year Book of General Therapeutics 1945

Editor : O. W. BETHEA, PH.M., M.D., F.A.C.P., formerly professor of clinical medicine, Tulane University school of medicine. Chicago : Year Book Publishers. London : H. K. Lewis. Pp. 456. 18*s*.

THOROUGHLY up to date (it includes abstracts of articles published in December, 1945), this yearbook contains a well-balanced collection of the important articles on therapeutics which have appeared during the year, though with a natural bias in favour of American contributions. Penicillin takes pride of place, occupying more than a quarter of the book, but other branches of therapeutics are given their share.

SURFACE ANAESTHESIA

with

NUPERCAINE

"Fortunately, Nupercaine is a complete substitute for cocaine."
Practitioner, 1936, 136, 509.

NUPERCAINE LOZENGES

each containing 1 mg., produce a prolonged anaesthesia of the mucous membranes of the mouth and throat, alleviate the discomfort of sore throat and allay post-tonsillectomy distress. *(Boxes of 15 and bottles of 100)*

NUPERCAINAL

a 1 per cent. ointment producing prolonged analgesia in chaps, herpes zoster, burns, sunburn, anal fissure, haemorrhoids, pruritus. *(Tubes of 1 oz.)*

NUPERCAINE SUPPOSITORIES

each containing 0.012 g., may be employed in the treatment of anal fissure and painful haemorrhoids or, post-operatively where a prolonged action is desired. *(Boxes of 5)*

NUPERCAINE 2% SOLUTION

for anaesthesia of the mucous membranes of the ear, mouth, throat and nose. May be employed topically in proctology. *(Bottles of 30 c.cm.)*

NUPERCAINE LUBRICANT

an efficient anaesthetic lubricant containing 10%, for use with tracheal tubes only, facilitates introduction and renders their presence more tolerable. *(Containers of 1 oz.)*

Samples are available for clinical trial.

★ A copy of The Nupercaine Handbook, Part II, Ciba Handbook No. 2, second edition, a 32 page survey of the special advantages of Nupercaine for surface, infiltration and regional anaesthesia, will be sent free to members of the Medical Profession on request.

Ciba
LIMITED

THE LABORATORIES • HORSHAM • SUSSEX

Telephone · HORSHAM 1234 *Telegrams* : CIBALABS, HORSHAM

A60

DEHYDROCHOLIN B.D.H.

(Dehydrocholic Acid B.D.H.)

Dehydrocholin B.D.H. has two outstanding physiological actions which make it of considerable value in general medical practice. First, it is a potent *hydro*-choleretic. It increases the amount of bile secreted by the liver and its degree of dilution; thus it has a combined solvent and flushing effect in the whole biliary tract. Second, Dehydrocholin B.D.H. stimulates the other hepatic functions, in particular its detoxicating activity.

Thus the indications for Dehydrocholin B.D.H. may be classified into two main groups, (1) biliary insufficiency associated with jaundice, cholelithiasis and cholecystitis, and (2) hepatic inadequacy in overcoming toxic states such as those caused by drugs containing arsenic, gold or mercury and in certain allergic conditions.

For injection: 10 c.c. ampoules of 20 per cent.
sodium dehydrocholate solution.

For oral use: 0.25 grm. tablets of dehydrocholic acid.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London

Dhyd/E/17

Acid Milk IN INFANT FEEDING

THE wealth of buffer substances in milk results in the absorption of considerable quantities of acid in the digestive tract. In cases of under-nourishment, functional or otherwise, it is reasonable to give the infant the kind of nourishment which will necessitate the least effort, and controlled acidification offers a means of reducing demands on the secretory functions. In view of the varied nutritional requirements of conditions requiring acid milk feeding, the following range of products is available.

LACIDAC
SEPARATED

Almost fat-free. Suitable for temporary feeding of infants incapable of tolerating fat.

LACIDAC
FULL CREAM

Suitable for long term use or as a final stage of graduation to normal feeding.

LACIDAC
HALF CREAM

An intermediate grade for less severe cases and for graduation to normal feeding.

PROLAC

Of approximately half cream fat standard but with increased protein as required in gastro-enteritis, etc.

Full particulars of these and other COW & GATE products are available on application to:

COW & GATE LTD
Medical and Research Dept. L , GUILDFORD, SURREY

©3395

THE LANCET

LONDON: SATURDAY, JULY 13, 1946

Out of Committee

AFTER twenty days' deliberation in committee the National Health Service Bill has returned to the House of Commons, and now awaits further debate on the report stage and the third reading. It returns in familiar form, and the cynic may well be heard saying that, for all the change visible, the twenty days might well have been saved. But the cynic would be wrong. The value of the committee's efforts cannot be gauged by merely examining the comparatively few amendments which were successful and therefore modified the wording of the Bill. There were many other amendments which were withdrawn but nevertheless served their purpose of inducing the MINISTER OF HEALTH to make a clause clearer, or to declare the Government's designs as regards some particular part of this vast and varied field. Often his attention was drawn to a possible interpretation which was both unsuspected and undesirable; and as often he promised to look again at the scope or wording, and to see that ambiguity or injustice is removed, before the Bill continues its passage through Parliament. Nobody can now complain that detailed scrutiny has not been given, and that the MINISTER'S intentions have not been elicited; and the question will be asked how far the Government have met objections to the original text of the Bill.

In trying to answer this question we are met at once by the difficulty that much that the MINISTER has proclaimed as his intention still finds no place in the Bill, and depends on the drafting of regulations. Part of the uneasiness of the profession has always come from the fact that the Bill is largely an enabling measure, allowing the present or a future Minister to make or to mar, to continue or to alter, the whole shape of the new service, by orders or regulations. The profession has pleaded that many matters which the Bill leaves to regulation would be better settled now and defined in the Act. It was felt, for example, that the composition of the regional board would be better laid down definitely in a form that would ensure a permanent unalterable balance between the groups of members drawn from different sources. Mr. BEVAN resisted this suggestion, as he did almost all others that sought to limit the power of the Ministry to adapt the future service as future needs dictate. Early in the debate he showed his determination to keep the Bill as flexible, and as adaptable to changing conditions, as could be. "The more," he said, "that we put into this Bill of a defining character, the less elastic, the less resilient, the service will become." To this attitude he adhered throughout the twenty days, with the result that the main framework of the Bill remains much as it was, still waiting to be clothed by regulations whose exact wording will probably not be known for some months. We may, however, take some comfort from the MINISTER'S repeated indication that in the framing of regulations there will be consultation with professional and other interested bodies, and his specific statement that the Central Health Services Council can review "any regulation the Minister proposes to make, and advise him upon it, on its own initiative." Though the large majority of the regulations will be the subject only of "negative resolution" in the House—i.e., they will have the immediate force of law unless a member successfully moves a prayer against them—it was agreed that some few which have particular financial or controversial implications might be made to require an "affirmative resolution." Among these will probably be those defining the constitution and geographical extent of the proposed regional areas. This is an important concession, because it will enable the merits of any proposed division to be debated before parliamentary approval is given; and it is doubly important in view of the growing recognition of the danger that hospital management will be overcentralised if the regions are made too few, and so too large and unwieldy.

On the general-practitioner services three main objections to the Bill were raised by professional bodies: they disapproved of payment by salary, of abolition of the purchase of practices, and of the so-called direction of doctors. On none of these points has Mr. BEVAN appreciably moved from the position he took up in the debate on the second reading. What he has evidently tried to do is to make sure that the profession's worst fears of the cumulative effect of these three provisions will not be realised. On remuneration by salary he said:

> "I am firmly convinced that it is necessary to have an element of basic salary in the doctors' remuneration."
>
> "There will be circumstances where it will be necessary to weight the basic salary to get sufficient doctors into under-doctored areas."
>
> "At the same time, I have accepted the proposition that a full salaried service is not reasonable, and in existing conditions would not operate to the best advantage of the community."
>
> "I found it very difficult to reconcile the free choice of doctor with the complete abolition of capitation."
>
> "Therefore, most unusually for me, I reached what I think was an ingenious compromise between the two principles. . . . It is an attempt to introduce into the system two desirable elements—the element of security for the individual, and the element of competition in order to sweeten and refresh the service."

These quotations make his attitude clear; and his arguments evidently satisfied his own supporters, who rejected an Opposition amendment that payment should ordinarily be by capitation alone. We must expect this verdict to be endorsed by the parliamentary majority, and the profession will therefore have to ask itself soon whether Mr. BEVAN'S "ingenious compromise" can be made a sound foundation for the new service.

The main objection raised to the basic salary has been that, taken with the abolition of the purchase of practices, it would lead inevitably to bureaucratic decisions on where any new entrant to medicine should be allowed to practise. Mr. BEVAN has not denied that he wants to be able to prevent new members of the public service from settling in areas already more than well provided, but he makes it clear that the decision as to which areas shall from time to time be held to require no more doctors shall be made only on the advice of a predominantly professional body—the Medical Practices Committee. He has also now recognised that, when a new doctor is to be selected for an area, the doctors already in practice in that area should have "some chance of determining their new colleague." To this end he suggests that the appointment shall be made by the local executive council after hearing recommendations from the local medical committee. "So we get three things we are anxious to keep. We get the doctors themselves influencing the appointment of their new colleagues; we get the local executive which is going to have the supervision of the medical service in that area, appointing; and we get the central committee" (the Medical Practices Committee) "confirming the appointment." To this end a new section has been added to clause 34.

In clause 35 (the so-called penal clause) the MINISTER, while insisting that he must retain the sanctions against the hidden sale of goodwill once compensation has been allocated, nevertheless agreed to meet the risk that practitioners making bona-fide contracts of partnership or assistantship might find themselves transgressing the law, and so becoming liable to severe penalties. He therefore proposed—and the committee agreed—to add new subsections to this clause, the effect of which will be to let practitioners report to, and register with, the Medical Practices Committee any agreements they propose making. If that committee agrees that the contract is a legitimate one, the parties will be protected against any subsequent suggestion that they sought in any clandestine way to sell or purchase practice goodwill.

Once again we find Mr. BEVAN refusing to abandon the principles on which he built his Bill, yet endeavouring to convince Parliament that his proposals will not be allowed to operate with injustice. The profession, while appreciative of his intentions, and of the few liberalising changes that have been made, will be disappointed that more alterations could not have been accepted in the text. Further changes in the Bill itself are scarcely likely to be numerous. We shall, however, hope to see the MINISTER's assurances, on so many matters, translated into regulations at an early date.

Gloom about Babies

HOWEVER attractive may be the prospect of a Britain with a population of 30 million instead of 45 million, we cannot scale down our present population without risk of hardship and unpleasantness. Moreover, a decline, once in motion, will tend to be self-perpetuating. These facts are heavily underlined in P.E.P.'s third broadsheet on population problems,[1] which sets out to assess the effects of declining numbers on Britain's future place in the world. This analysis suggests that if pre-war fertility trends are maintained we shall be faced, from about 1970 onwards, with "a Britain shrinking within its skin, becoming too small for its buildings, its equipment, its responsibilities, becoming on the average very much older in years though perhaps not proportionally so much older in health, a society of families of one or two, whose children miss the advantages of growing up with several brothers and sisters, a society tending to become stuck in the rut of decline." The writers argue that the economic effects, especially after 1970, will be harmful, and that "even a comparatively small drop" in numbers would "gravely weaken" Britain's position in the world. All this may indeed be true. Nevertheless the views expressed on the economic and international issues are not accepted by all who are thinking about the problem. A little more wisdom about the international control of atomic energy, and a little less fuss about national sovereignty, would certainly have more influence in determining Britain's status in the world than the loss of a million or so old people. Moreover, married couples cannot be frightened into having babies, and will seldom be moved by arguments about a weakening in the nation's position. Gloom also can be self-perpetuating, and propaganda based on fear is liable to defeat its own ends by destroying confidence in the future.

Pessimism is partly justified, however, by the general lack of interest in this important subject. Even our Governments, though a Royal Commission was appointed over two years ago, have shown few signs of taking the population situation into account when framing social policies. While tenders are being approved for dwellings for old people, no new houses with more than three bedrooms are being built; the New Towns Bill has nothing to say about it; no consideration seems to have been given to the question of rents and family size; the day-nursery grant from the Exchequer has been halved; the revised arrangements for Service pay abolish children's allowances, so that in future the married man (whether colonel or private) with four children will get exactly the same as those without children; the higher earned-income allowance for married women further widens the economic gap between married couples with and without children; while no-one apparently has thought of early payment of post-war credits to families with three or more children as well as to old people. A catalogue of this kind, after the net reproduction-rate has been below unity for 23 years, does not substantiate the view that the country is population-conscious. If Governments are to be persuaded to take an interest in the social process more than five years ahead, population research will have to concentrate more on current fertility patterns and the investigation of incentives and deterrents to parenthood.

Professor BAIRD's researches in Aberdeen, recorded on another page, show how badly we need national statistics on current reproductive behaviour. He finds in his nursing-home group, corresponding to the Registrar-General's social classes I and II, a large proportion of late marriages, no prenuptial conceptions, and very small families. On the other hand, in the booked hospital cases (social classes III–V) a proportion of women were pregnant before marriage, married before the age of twenty, and had very large families. In a further group of 2100 women of the same social class delivered under the domiciliary scheme, 18·4% had had more than five children, while there were 4·8% with nine or more. Such figures indicate great variation in the distribution of family sizes, and taken in conjunction with a background of poverty, ill health, and ignorance raise eugenic questions. BAIRD finds that these large families are almost all produced by women who seem incapable of planning their lives; everything, in fact, seems haphazard from the first conception before they are married in their teens.

---

[1] Population: a Challenge and a Choice. Broadsheet no. 251, June 14, 1946. Previous broadsheets (nos. 241 and 242) were published on Nov. 9 and Dec. 7, 1945; see *Lancet*, Jan. 12, 1946, p. 59.

In a lecture which we published on June 22 Dr. A. S. **Parkes**, also discussing the qualitative aspect of differential fertility, concluded that there is now no weeding-out by death of bad stocks.

At the beginning of this century there was undoubtedly a large "fertility differential" between clearly defined social groups. But is there today? To what extent are the Aberdeen figures true of the rest of Scotland, or applicable to England and Wales? The trouble about fertility data derived from records of confinements, valuable though they are in many respects, is that they are biased by selection. Only the women who have babies during the few years under observation, and especially those with frequent child-bearing histories, appear in the tables. Those who are childless, or who have long intervals between their pregnancies, escape analysis. It has also to be remembered that many of the mothers in Aberdeen with more than five confinements were born before the first world war, and in their reproductive habits reflect an attitude towards sex and childbearing which belongs to a generation that is passing away. We should like to know whether women who conceived before an early marriage in the last 5–10 years are behaving in the same way, and whether the numerical importance of this group and its contribution to future society is larger or smaller than it used to be. The 1943 report of the Registrar-General for Scotland shows, since 1939, an increase in the number of first and second children but a considerable decline in the number and proportion of fourth-plus children. Until, however, we have the report of the Royal Commission's family census no conclusive answers can be given to the many questions concerning contemporary reproductive trends.

Reconstructive Surgery of the Hand

When the late war started, much of our knowledge of reconstructive surgery of the hand was based on the pioneer work of Dr. **Sterling Bunnell**, of San Francisco. During the past two years, as consultant in hand injuries to the U.S. secretary for war, Dr. **Bunnell** has supervised the treatment of the 20,000 soldiers with hand wounds who have returned to America. In his two recent talks, at Guy's Hospital and at the Royal Society of Medicine, he could therefore describe how the U.S. Army organisation for the care of complex hand injuries was evolved, and the principles on which it works. The repair of the hand extends into the domains of plastic surgeon, orthopædic surgeon, and neurosurgeon; but the hand is too small for three surgeons to use it as their operative field without destroying its function with scar tissue. The need for "composite specialists," working in centres with highly trained teams, was therefore clear when vast numbers of hand wounds demanded attention. The surgeons chosen for the charge of hand centres were men who had some experience of all three specialties and were of an ingenious turn of mind. Nine hand centres, each with 200–300 beds, were organised under Dr. **Bunnell**, and were placed in the same general hospitals as the plastic and orthopædic units with which they were to coöperate. The hand extends "mechanically to the elbow and dynamically to the opposite cerebral cortex," so the hand centres treat any wound of the forearm producing a major disability of the hand, and have a consultative interest in brachial plexus and brain injuries leading to loss of function of the hand.

In summarising the principles of treatment adopted at the centres, Dr. **Bunnell** urged the necessity for preliminary excision of scars and their replacement by well-vascularised tissue to ensure adequate nutrition of the part, if nerve and tendon grafts are to be successful. A scar of wrist or palm involving only a third of its circumference can so compress the vessels as to produce cold blue digits and an operative field quite unsuitable for reparative work. The replacement of this scar by vascular tissue (by tube-pedicle or flap graft) lets the hand "breathe and bloom again." In repairs of cover loss by free grafts, it is the borders of the grafts which are important, for it is along these borders that contraction occurs and limits mobility. The edges of a graft should never be parallel to the webs of the fingers but should extend in a V into the palm or on to the dorsum. On the back of the hand the margins of free grafts should be zigzagged, so that the "border scar" will not limit opposition of the thumb. On the backs of digits enough skin should be excised for the edges of the free grafts to lie along the mid-lateral lines; if the edges lie in front of or behind this plane they hypertrophy and limit movement. In direct pedicle-flap repairs to the hand the base of the pedicle as well as the secondary defect should be sealed with a free graft; if this pedicle base is left raw, lymph pours from it into the hand and can stiffen the digits in the two or three weeks during which the hand is attached to the pedicle. In the repair of divided nerves, Dr. **Bunnell** reports successful approximations of median and ulnar nerves over gaps of 5 inches; after these operations flexion of the arm-joints is strictly maintained for four weeks. For nerve grafts he has used two or three thin cable grafts for both median and ulnar nerves; thick grafts tend to produce central necrosis of the nerve. Divided digital nerves should be sutured whenever possible, and regeneration at the rate of a phalanx a month is obtained in most cases; Davis and Geck suture silk is used for this work.

For tendon repairs Dr. **Bunnell** uses a stainless steel pull-out suture. "The suture material which causes the least reaction," he says, "is that which is not there." If tendon suture between the distal palmar crease and the mid-volar creases—"no-man's land"—is to succeed, some special points must be attended to, such as the provision of room for reactionary expansion of the sutured tendon by excising the sublimis and incising the fibrous theca at the site of the proximal pulley. Tendon grafts, like nerve grafts, must be thin if they are to be vascularised and live. The tendons of palmaris longus and the long extensors of the toes are suitable for grafts. The restoration of function by tendon redistribution in ulnar palsies is done by using the sublimis to replace the lumbricals; the extensor proprius can be made to provide abduction of the index. In median palsies a tendon sling across the palm to which a flexor tendon is attached will produce opposition of the thumb. For repairs of the metacarpals iliac medulla has been used; these grafts are fixed by Kirschner wires which are removed later, their ends being buried subcutaneously while they are in place. When digits and metacarpals are missing, a remaining metacarpal can be "jogged" into the site of an absent and more essential one. When the skin envelope is tight, excision of the metacarpal of a missing or useless digit will provide breathing room for the rest. Where digits have been lost, osteotomies may be needed to produce opposition and maximum function of the remaining digits. Dr. BUNNELL emphasised the value of capsulotomy in the relief of stiff metacarpophalangeal joints. He noted too the value of a graft of the metatarsal heads to replace a shattered metacarpal head when metacarpophalangeal joints are ankylosed. Speaking of priorities in hand and arm surgery, Dr. BUNNELL urged that nerve repairs should not be deferred until bony continuity is established, but that the nerves to the hand should be repaired as soon as there is covering tissue of good nutrition—at or even before the time when the humerus or forearm bones are grafted.

Many of these lessons conform to British surgical practice, but Dr. BUNNELL's experience of hand injuries is unique, so it was natural that both the emphasis and some of the details of the picture he presented were new to his audiences. Particularly noteworthy was his insistence on the routine repair of divided digital nerves, and his demonstration of the value of metacarpal surgery, and of tendon and muscle redistributions in ulnar and median palsies. In this department of surgery the U.S. Army hand centres set the standard for the world today, and on the recommendation of Sir HAROLD GILLIES plastic and orthopædic surgeons of the British Army have already been sent to observe their methods. Dr. BUNNELL went far towards convincing his many hearers that in our own hand injuries the best results can only be obtained by the establishment of one or more special hand centres in this country.

Annotations

PATHOLOGICAL SOCIETY OF LONDON

IN 1846 this society was founded by a group of doctors who were particularly interested in pathological studies, and over 100 members were enrolled. By the following year the membership had risen to 130, and during the next sixty years the society's early promise was amply confirmed by the contributions of men like Bright, Hodgkin, Paget, Quain, and Wilkes.

When the Royal Society of Medicine was formed in 1907, the Pathological Society of London became its pathological section; and on Tuesday of last week the section celebrated its centenary. The guests were received by Sir Henry Tidy (on behalf of the president of the society), and by Prof. W. G. Barnard, president of the section. An account of the steady and continuous progress made in the years before amalgamation was given by Prof. H. R. Dean. Prof. G. R. Cameron, who spoke on cellular pathology, recalled the concern of the early investigators with the nature of protoplasm as well as with the cell unit; he predicted that, just as the cellular theory of Virchow had provided a new conception, so now the study of protoplasm would probably provide an equally radical advance in our knowledge of life and pathology. He was followed by Sir Paul Fildes, who described with subtle humour the change in the bacteriologist's status from technician and servant of the clinician to colleague of equal standing. He indicated bacteriology's dual function—the study of bacteria for their own sakes and, arising from this, the combating of bacteria in the body. Prof. E. C. Dodds gave a stimulating account of the relationship between chemistry and pathology, and made a plea for the closer integration of chemistry in medicine. In the last address, Prof. James McIntosh said that progress in the study of viruses, the youngest branch of pathology, had equalled that in other branches.

Those admitted to honorary membership of the section in connexion with the celebration were: Sir Lenthal Cheatle, Prof. H. R. Dean, Sir Paul Fildes, Sir Alexander Fleming, Dr. H. Morley Fletcher, Dr. W. E. Gye, Sir Gowland Hopkins, Prof. E. L. Kennaway, Prof. James McIntosh, Sir Charles Martin, Sir Robert Muir, Dr. J. A. Murray, Sir Charles Sherrington, Prof. M. J. Stewart, Prof. H. M. Turnbull, Dr. Arthur Whitfield, and Sir Almroth Wright.

FLUIDS IN HEART-FAILURE

THE traditional diet in congestive heart-failure is low in sodium with a restricted fluid intake, but White and colleagues[1] now recommend a low-sodium diet with ample fluids. Their thesis is that, provided the sodium intake is low enough, fluid will not be retained, and that a free fluid intake not only saves the patient from discomfort but may also aid renal function. They claim that such a régime sometimes controls œdema more efficiently than the usual diuretics. Of 64 patients treated on these lines, 17 obtained much benefit, 15 moderate benefit, 8 slight benefit, and 7 no benefit; the remaining 17 either defaulted or supplied insufficient data. The diet used contained 700 mg. of sodium (equivalent to 1·75 g. of sodium chloride) in an amount of food equivalent to 1800 calories, and the patients were allowed to take water freely. No salt or soda was allowed in cooking or at table; no salt substitute could be taken that contained sodium; butter was unsalted; and bread and salad dressings were salt-free. Ammonium chloride sprinkled on the food was allowed if the patient found the food "too flat."

On theoretical grounds there is much to be said for this régime, provided the other recognised measures for treating congestive failure are applied. But the diet is extremely dull, as anyone who has sampled salt-free bread, for instance, will agree, and it is doubtful whether many households in this country, even in normal times, could undertake it. In hospital it may be another matter, but even there the emotional effect of such a diet must be considerable, and its use savours of treating the disease rather than the patient. For most cases of congestive failure physicians will probably prefer a moderate restriction of fluid intake, combined with the maximum restriction of sodium intake compatible with a diet that is both attractive to the patient and easily prepared—and incidentally one containing as much protein as the patient can digest. This régime, coupled with rest, digitalis, and mercurial diuretics, will give the best results in the great majority of patients. In the minority who do not respond, a strictly controlled sodium intake with free fluid is worthy of trial.

WORK OF THE NUFFIELD FOUNDATION

THE first report of the Nuffield Foundation—discursive, intimate, and handsomely printed on thick paper—is a shock to the careful habits which seven years of war and peace have bred in us. But trans-Atlantic broadcasters continually remind us that we have forgotten how to enjoy ourselves; and perhaps an occasional example of good production may guide us towards a gentle frivolity, much as the fast of Lent used to be broken with an egg.

The trustees, under the chairmanship of Sir William Goodenough, have a wide range of useful work to discuss. When, in 1943, Lord Nuffield established the foundation, and endowed it with £10,000,000 of Morris Motors stock, he had three main objects—the advancement of health and the prevention and relief of sickness, the advancement of social well-being, and the care and comfort of the aged poor. The trustees have seen it as a healthy duty on those responsible for dispensing private funds "to accept risks which cannot be proper to those accountable for the taxpayers' money." This, of course, is in the true voluntary tradition. They have decided to follow the American plan of making grants for a limited period to schemes which the foundation initiates (though they will continue, after that, to take an interest in other ways): the aim being to stimulate local or general enterprise, and so widen the health services steadily. They plan to work in five-year periods, the programme for the years 1944–45 to 1949–50 covering five main fields—the medical, natural, and social sciences, fellowships and awards, and the care of the aged poor. The total grants made during the first three years of their activities have amounted to £882,820.

---

[1] Bridges, W. C., Wheeler, E. O., White, P. D. *New Engl. J. Med.* 1946, **234**, 573.

In the medical sciences grants have been made towards child health, and industrial and dental health. The trustees helped London University to found the new institute of child health, contributing £100,000 (payable in instalments over ten years) to the endowment of the professorship now held by Dr. Alan Moncrieff. Great Britain has lagged behind some other countries in providing training in industrial health; early in 1944 the trustees offered to coöperate in the plans of the universities of Durham, Glasgow, and Manchester for founding departments for its study, and gave substantial grants to all three. The new departments are to work in association not only with the Ministry of Labour and with the Industrial Health Research Board but also with local industries, and with the university organisations for the study of social medicine. At Manchester and Glasgow the heads of the departments will also hold consultative appointments in local industry. Other grants have been promised towards a project for an industrial health, general reablement, and research service at Slough. This will be under the direction of a well-qualified and experienced doctor, and will include an industrial health centre giving expert advice on working conditions in factories and workshops, a casualty clinic, an outpatient reablement department, a remedial workshop, and a research department. The staff will be able to examine the best ways of providing an industrial health service for small firms which cannot afford to employ doctors and nurses of their own. To forward dental health the trustees have made grants of £25,000, spread over ten years, to the Sutherland dental school of Durham University to meet the salary of a whole-time lecturer in physiology and the costs of a professorial department of oral medicine which is about to be established. Guy's Hospital dental school is receiving a similar grant, to found a department of medicine to study diseases of the mouth and their local and general effects. A lecturer with scientific and laboratory training is to be appointed at Leeds University school of dentistry, and at Manchester a grant is being given towards the cost of a department of preventive dentistry and research. Other projects under this heading include grants to the Nuffield laboratory of ophthalmology at Oxford, and to Manchester University for the study of nasal catarrh.

The policy of the trustees towards the aged poor is practical and optimistic. They remark that, as machines continue to replace muscles, the possibilities of living a useful and self-supporting life when well stricken in years are steadily improving. A committee to survey the problems of ageing and of care of the aged was appointed under the chairmanship of Mr. Seebohm Rowntree and is expected to report soon. Meanwhile, grants have been made to Cambridge for a study of the causes and results of ageing, and an inquiry to decide how the middle-aged and elderly learn, and what they are capable of learning. It seems likely that our generation, after a hard-working childhood and a laborious youth and middle life, is in for a busy old age; but as the trustees rightly hold, this will bring new hope and purpose to all who are reluctant to become a burden.

In the natural sciences, grants have been made to the universities of Birmingham, Glasgow, Manchester, Oxford, and Cambridge, and to Birkbeck College of London University, for researches into molecular and atomic problems of physics, protein and virus molecules, cosmic rays, astrophysics, metallurgy, and agriculture. Social sciences are being encouraged by grants to the National Institute of Economic and Social Research, and the Population Investigation Committee. If a National Administrative Staff College is founded, to investigate and explain principles and techniques of organisation, administration, and leadership in civil life, the foundation will offer scholarships to students of merit who need assistance to attend the college. Among other scholarships and awards are Nuffield medical fellowships to train teachers and research-workers in preventive medicine; and dental fellowships and scholarships to enable selected qualified dentists to take additional training to fit them for an academic career and for research, and scholarships for dental students of high ability who wish to spend a longer time in scientific study. Medical travelling fellowships are offered to doctors in the Dominions who wish to come over for postgraduate training.

DIABETIC PLEURISY

EVERY medical student knows that respiratory infections can precipitate diabetic coma, and that diabetics show an increased liability to pulmonary tuberculosis. A complication has now been introduced by Armanino and Ory [1] who have observed five diabetic patients in coma or "pre-coma" in whom "pleurisy" seems to have arisen merely from dehydration. In all of them pleural friction was detected low down in the axillæ, and otherwise no radiological or clinical evidence of pleural or pulmonary infection could be found except in one where there were radiological signs of early pneumonia on the opposite side to the rub. The friction sounds disappeared rapidly with the administration of fluids, and so did the leucocytosis present in some of the cases. It is certainly conceivable that dryness of the pleura could produce a rub, and this view is supported by Davis's [2] findings in dogs; among the changes produced by severe dehydration was a dulling of the surfaces of the pleura, which were covered with fibrin. The abdominal pain of which patients in diabetic pre-coma sometimes complain may even be referred from the pleura, if this type of pleurisy turns out to be at all common. But the clinician will be chary in diagnosing diabetic pleurisy until he has convincingly excluded other possible causes, especially tuberculosis.

CHEMICAL COMPETITION

LECTURING to postgraduates in Edinburgh on June 4, Mr. W. O. Kermack, D.SC., described how molecules compete with one another for combination with a third, and quoted examples of simple competition in vivo, such as the fixation of calcium by oxalates and the affinity of carbon monoxide for hæmoglobin in competition with oxygen. The action of physostigmine and 'Prostigmin' represents a competitive interference with the effect of choline esterase on its substrate acetylcholine so that the action of the latter is made more manifest. Amphetamine probably stimulates cerebral activity by inhibiting the enzyme amine oxidase through substrate competition, thus preventing the formation of toxic aldehydes in the brain. This same enzyme also destroys adrenaline, an action which is prevented by ephedrine which then competes for tissue receptors with the adrenaline it has preserved and so modifies its action.

---

[1] Armanino, L. P., Ory, E. M. *Amer. J. med. Sci.* 1946, 211, 597.
[2] Davis, H. A. *Arch. Surg., Chicago*, 1941, 42, 939.

Competition has recently been made use of in the production of British anti-lewisite (B.A.L.), which prevents combination between the trivalent arsenical vesicant, lewisite, and tissue sulphide groups; it can also recapture arsenicals and mercury from the body tissues and so may be effective in the treatment of arsenical and mercurial poisoning.

In the field of immunology, Landsteiner found that proteins modified by the introduction of certain chemical groups could be used as antigens to produce antibodies specific to the chemical group concerned. The reaction between the modified protein and its antibody could then be competitively inhibited by the presence of the chemical originally combined with the protein. Harington produced a thyroxine antibody and an anti-aspirin serum which could nullify the effects of these drugs in vivo.

The principle of chemical competition is important in chemotherapy. The sulphonamides compete in cell metabolism with *p*-aminobenzoic acid and so displace this essential bacterial metabolite from its proper rôle. Various components of the vitamin-B complex are essential growth factors for many organisms. When the molecules of these substances are suitably modified, the resulting compounds inhibit the growth factors by chemical competition and so act as antagonists to bacterial growth. These substances often fail as chemotherapeutic agents because, being based on vitamins required for the host, they may prove as toxic to the patient as to the parasites. To be of value in practical chemotherapy a chemical agent must be selectively antagonistic towards an essential metabolite of the micro-organism it is to attack but inactive against the factors essential to the normal physiological processes of the host.

MALARIA IN BRIEF

The need for speedy restoration and development of the tropical territories ravaged during the war, or forced into unproductive idleness, is obvious to all. The military successes in the Mediterranean and in the Far East could scarcely have been attained but for the forethought devoted to the physical welfare of the troops, and the operations in these areas have proved yet again that maintenance of health is necessary to the successful use of labour forces there, whether in a military or in a commercial capacity.

The conditions of existence of the indigenous inhabitants of the more remote parts of the tropical world are by modern standards poor. Of the many diseases prevalent the most important is malaria, and employers of labour in the tropics are belatedly becoming aware that it must be controlled for commercial if no other reasons. The war years have seen substantial advances in technique, and in an authoritative booklet Dr. G. Macdonald, director of the Ross Institute, gives an account of modern methods of defence against the disease.[1] He is writing primarily for planters, miners, and others responsible for managing labour in Malaya, but the information is applicable equally to other malarious areas and will be helpful to doctors as well as laymen. In some sixty pages he gives a general account of the various types of malaria, of their mode of development and spread, and of the factors governing their incidence, and sets out the principles of control. Information on simple methods of determining the incidence, and the significance of this in forecasting morbidity-rates in newcomers to the area, leads to advice on the selection of sites for houses and labour camps and on measures of personal and communal protection against infection. Detailed instructions are given on controlling the mosquito population by engineering works, by chemical poisoning, by naturalistic means, and by taking care not to create breeding-places; and notes are added on the preparation of an insecticidal spray, and the properties and constitution of D.D.T.

MENTAL HEALTH IN AMERICA

A new National Mental Health Bill, now under discussion in the United States, provides for setting up a national psychiatric institute, and allocates 10 million dollars yearly for grants in aid of research to universities, hospitals, laboratories, and other public and private institutions, and to individuals. A press statement from the New York Academy of Medicine argues that the new institute should not be isolated, either geographically or intellectually, but should be placed near a city where the staff could have the benefit of exchanging ideas with other workers. Discharged inpatients should become outpatients, the course of their illness being thoroughly studied and followed up; and the same psychiatrists who treat them while they are in hospital must be able to watch them as outpatients. It is also felt that the institute should be of a moderate size; in very large institutions maintenance is costly and investigation may be hampered. Moreover a rapid turnover of patients is inadvisable, since " more can be learned from a careful long-term study of a small group of patients than from a more superficial study of great numbers." Doctors chosen for psychiatric training in the new institute are to be selected with great care, in the hope that they will later raise the level of psychiatry throughout the country. At present psychiatric clinics, both for children and adults, are relatively scarce even in the large cities of the United States, and psychiatric training in medical schools is as perfunctory as it is in many British schools: the student spends a few hours in the wards of an institution for psychotics, and that is all. It is hoped that the Bill will ensure proper teaching on the emotional conflicts which are bound up with so many illnesses.

SERVICE PAY

The new scales of pay for Service doctors, reported on p. 66, contain slight but notable advances on the present basic rates. The innovation of uniform remuneration for equivalent ranks in all three Services is welcome, as is the upward grading of pay in the early years with increasing service, and independent of promotion. The specialist, whose case is still under consideration, needs perhaps no special plea, the Services having shown increasing awareness of the need to attract this class of doctor and to nurture the potential specialists in their ranks. But some assurance that, for others, special aptitude or industry will receive its due reward would be welcome. It has long been a common complaint of officers in the peace-time Services that, whatever their merit, promotion in the junior ranks is too often dictated by length of service only, and that thereafter advancement depends largely on seniority and the varying chances of vacancies on the establishment.

Sir Ambrose Woodall, F.R.C.S., who received a peerage on the King's Birthday, has taken the title of Baron Uvedale of North End.

We regret to record that Dr. T. Izod Bennett, physician to the Middlesex Hospital, died on Wednesday last.

It is announced that Lord Horder is to advise the flour-milling industry on medical and nutritional matters concerning flour and bread. He will join a team of advisers which includes Prof. E. C. Dodds, F.R.S., director of the Courtauld Institute of Biochemistry, Middlesex Hospital, and Mr. T. Moran, D.SC., director of the British Flour Millers' Cereals Research Station at St. Albans.

---

[1] Notes on Malaria and its Control for Planters and Miners. Published under the authority of the Ross Institute Industrial Advisory Committee by the Malayan Chamber of Mines (Incorporated) and the Rubber Growers' Association (Incorporated), April, 1946. Pp. 61.

Special Articles

ROYAL SOCIETY EMPIRE SCIENTIFIC CONFERENCE

AT the first morning session of the conference on July 3, held in Oxford, the subject for discussion was

Nutrition

Prof. R. A. PETERS, F.R.S., who was in the chair, quoted an article submitted by Dr. L. B. Pett which pointed out that "the nutrition problem is a medical one consisting in the diagnosis of those individuals who could benefit by improved dietaries. The solution of the problem is providing these people with the information about, and the means of obtaining, the necessary diets. In fact, however, there is still no sure way of diagnosing much of the malnutrition that may exist. . . . Under these circumstances it is understandable that the nutrition problem is still one of research on the one hand and of rather general public-health measures aimed at prevention on the other." Dr. Pett had called attention to the need for further research on nutrition in Canada, and for better coördination among those engaged on such research.

MALNUTRITION IN THE COLONIES

Dr. B. S. PLATT (London) discussed the nutritional studies of the indigenous peoples of the Colonies. It had been thought necessary to find out whether a nutritional problem existed among the Colonial peoples, and for this there were two main methods: (1) data on nutriture could be obtained from clinical observations and from relevant vital statistics; (2) data on food-consumption could be obtained from information concerning food-production and importation, or from dietary surveys. Once the problem had been defined it was necessary to plan improvements and decide how the resources of land and labour could best be used to secure improved nutrition. This attack involved such matters as health, soil fertility, water-supplies, food technology, education, and administration, so any plan for improvement must be a combined operation. This combined effort could best be achieved through a local nutrition committee, with a technical staff coöperating to implement its scientific food policy. As a step towards assisting Colonial governments in this, ten dietists had already been trained to provide technical and other assistance to such committees. To illustrate the existence of *malnutrition, Dr. Platt* reviewed the work published since 1936. Many of the problems of malnutrition were of long standing, but not all; thus in Basutoland 967 cases of pellagra were reported in 1943, but this appeared to be a new disease in the territory, associated with a new method of milling. Pellagra is a troublesome problem in Hong-Kong, Nigeria, and the Gold Coast. Beriberi is still a common disease and cause of death in Hong-Kong and Malaya; in 1940 it was responsible for no less than 7229 deaths in Hong-Kong. Apart from these and other classical nutritional deficiencies, diseases partly attributable to malnutrition are frequent, including tropical ulcer and toxæmia of pregnancy. One of the clearest indications of the dependence of the infant's nutrition on the nutrition of the mother during pregnancy was the relationship of birth-weight to the total protein in the mother's diet during pregnancy. In some Colonies the average birth-weight increases with the social status of the mother. Infant nutrition in Colonial territories would be a profitable subject for research, and a start on these lines had already been made in the West Indies. The organisations that should be concerned in a nutrition programme in the Colonies, totalling about 15, included the Medical Research Council and the Colonial Office, with the Colonial Medical Research Committee linking them and acting through a subcommittee on nutrition. This subcommittee acted on the one hand through a field research station, and on the other through the Colonial territory staff, who included the 10 trained dietists already mentioned. The field research station was linked to the human nutrition research unit and to a field working party. The importance of research into Colonial nutrition problems needed no emphasis.

SOUTH AFRICA

Dr. E. H. CLUVER, director of the South African Institute for Medical Research, pointed out that malnutrition was rife throughout Africa. Since tropical disorders of all kinds could be found in almost all parts of the continent, the ætiology of African nutritional disease was complex and its elucidation was very much a thing of the future. It was wrong to suppose that only further advances in fundamental knowledge were necessary—a more intensive study must be made of the application of such theories to the conditions among the different areas and races of Africa. Starvation occurred only rarely, but when found it caused even parliamentarians to react; the main problem however was one of unbalanced diet containing excess starch. In 1928 a commission of investigation had been set up by the government to investigate the problem of substandard Europeans and South Africans, usually referred to as "poor whites." These persons were unemployable because of their poor state of health, partly due to malnutrition. The problem was not only confined to "poor whites," and a nutrition council had been set up by parliament to define the whole problem. In 1928 pellagra had been reported in a Durban prison and cured by adding yeast to the diet. For many years scurvy had occurred in gold-miners put to work underground. Although there were 11 million Africans in the Union it was not possible to recruit from these the 250,000 that were needed for the gold-mines, because of their poor physique; more than half had to be recruited from outside the Union. A few years ago the Union health department of South Africa provided funds for the Cape Nutrition Survey, whose primary object was to establish reliable criteria for the recognition of human malnutrition. Coördination of this and other nutritional research in Africa should now be brought into effect. Existing knowledge should be applied and research extended; and it was essential to train a body of nutritional research scientists, adequate both in ability and numbers, to grapple with the vast unexplored problems that lie before us.

CEYLON

Prof. W. A. E. KARUNARATNE recalled that although malnutrition in Ceylon had had serious effects during the world economic depression of 1929–33, little or no attention was paid to the subject until Dr. Lucius Nicholls investigated phrynoderma in a Colombo jail; de Fonseca had already shown that this eruption reacted very favourably to cod-liver oil. It was soon recognised that other conditions caused by malnutrition were widely prevalent in Ceylon, and this led to a more elaborate nutritional survey undertaken by Nicholls in 1936. The defects caused by malnutrition were many, and included blindness; of 147 children in the blind school, more than 60% were blind as a result of keratomalacia due to severe deficiency of vitamin A. In a recent investigation in a large children's hospital in Colombo, Professor Fernando found that 72·9% of the children had clinical evidence of malnutrition, 16·1% having nutritional œdema. Rural dietary surveys conducted by Nicholls and Nimalasuriya in 1941 had also revealed a serious state of affairs. Since Ceylon is far from self-supporting in essential foodstuffs, a higher standard of nutrition demanded a greater development in agriculture and improvement in animal husbandry and fisheries. An appreciable increase in income was also essential. Other problems that would have to be taken into consideration included the extent of land that could be cultivated, the further development of irrigation, the prevalence of malnutrition, and the rapidly increasing population. In the last analysis, adequate nutrition is a matter of education and government.

DISCUSSION

Sir JOSEPH BARCROFT, F.R.S., reminded the meeting that agriculture had been defined as the science of getting more human food from a given number of acres, and that the late Lord Keynes had suggested amending this to "a given number of acres and energy." The main problem was to link medicine and agriculture.

Khan Bahadur HUSAIN (India) regretted that soya beans had been discouraged in his country, since in his view they could contribute a great deal to Indian economy.

Dr. D. M. BLAIR (Southern Rhodesia) regretted that food crops had been improved from the economic point of view but not from the nutritional: natives previously grew millet which would not sell and now grew white maize.

Competition has recently been made use of in the production of British anti-lewisite (B.A.L.), which prevents combination between the trivalent arsenical vesicant, lewisite, and tissue sulphide groups; it can also recapture arsenicals and mercury from the body tissues and so *may be effective in the treatment of arsenical and* mercurial poisoning.

In the field of immunology, Landsteiner found that proteins modified by the introduction of certain chemical groups could be used as antigens to produce antibodies specific to the chemical group concerned. The reaction between the modified protein and its antibody could then be competitively inhibited by the presence of the chemical originally combined with the protein. Harington produced a thyroxine antibody and an anti-aspirin serum which could nullify the effects of these drugs in vivo.

The principle of chemical competition is important in chemotherapy. The sulphonamides compete in cell metabolism with *p*-aminobenzoic acid and so displace this essential bacterial metabolite from its proper rôle. Various components of the vitamin-B complex are essential growth factors for many organisms. When the molecules of these substances are suitably modified, the resulting compounds inhibit the growth factors by chemical competition and so act as antagonists to bacterial growth. These substances often fail as chemotherapeutic agents because, being based on vitamins required for the host, they may prove as toxic to the patient as to the parasites. To be of value in practical chemotherapy a chemical agent must be selectively antagonistic towards an essential metabolite of the micro-organism it is to attack but inactive against the factors essential to the normal physiological processes of the host.

MALARIA IN BRIEF

THE need for speedy restoration and development of the tropical territories ravaged during the war, or forced into unproductive idleness, is obvious to all. The military successes in the Mediterranean and in the Far East could scarcely have been attained but for the forethought devoted to the physical welfare of the troops, and the operations in these areas have proved yet again that maintenance of health is necessary to the successful use of labour forces there, whether in a military or in a commercial capacity.

The conditions of existence of the indigenous inhabitants of the more remote parts of the tropical world are by modern standards poor. Of the many diseases prevalent the most important is malaria, and employers of labour in the tropics are belatedly becoming aware that it must be controlled for commercial if no other reasons. The war years have seen substantial advances in technique, and in an authoritative booklet Dr. G. Macdonald, director of the Ross Institute, gives an account of modern methods of defence against the disease.[1] He is writing primarily for planters, miners, and others responsible for managing labour in Malaya, but the information is applicable equally to other malarious areas and will be helpful to doctors as well as laymen. In some sixty pages he gives a general account of the various types of malaria, of their mode of development and spread, and of the factors governing their incidence, and sets out the principles of control. Information on simple methods of determining the incidence, and the significance of this in forecasting morbidity-rates in newcomers to the area, leads to advice on the selection of sites for houses and labour camps and on measures of personal and communal protection against infection. Detailed instructions are given on controlling the mosquito population by engineering works, by chemical poisoning, by naturalistic means, and by taking care not to create breeding-places; and notes are added on the preparation of an insecticidal spray, and the properties and constitution of D.D.T.

MENTAL HEALTH IN AMERICA

A NEW National Mental Health Bill, now under discussion in the United States, provides for setting up a national psychiatric institute, and allocates 10 million dollars yearly for grants in aid of research to universities, hospitals, laboratories, and other public and private institutions, and to individuals. A press statement from the New York Academy of Medicine argues that the new institute should not be isolated, either geographically or intellectually, but should be placed near a city where the staff could have the benefit of exchanging ideas with other workers. Discharged inpatients should become outpatients, the course of their illness being thoroughly studied and followed up; and the same psychiatrists who treat them while they are in hospital must be able to watch them as outpatients. It is also felt that the institute should be of a moderate size; in very large institutions maintenance is costly and investigation may be hampered. Moreover a rapid turnover of patients is inadvisable, since "more can be learned from a careful long-term study of a small group of patients than from a more superficial study of great numbers." Doctors chosen for psychiatric training in the new institute are to be selected with great care, in the hope that they will later raise the level of psychiatry throughout the country. At present psychiatric clinics, both for children and adults, are relatively scarce even in the large cities of the United States, and psychiatric training in medical schools is as perfunctory as it is in many British schools: the student spends a few hours in the wards of an institution for psychotics, and that is all. It is hoped that the Bill will ensure proper teaching on the emotional conflicts which are bound up with so many illnesses.

SERVICE PAY

THE new scales of pay for Service doctors, reported on p. 66, contain slight but notable advances on the present basic rates. The innovation of uniform remuneration for equivalent ranks in all three Services is welcome, as is the upward grading of pay in the early years with increasing service, and independent of promotion. The specialist, whose case is still under consideration, needs perhaps no special plea, the Services having shown increasing awareness of the need to attract this class of doctor and to nurture the potential specialists in their ranks. But some assurance that, for others, special aptitude or industry will receive its due reward would be welcome. It has long been a common complaint of officers in the peace-time Services that, whatever their merit, promotion in the junior ranks is too often dictated by length of service only, and that thereafter advancement depends largely on seniority and the varying chances of vacancies on the establishment.

Sir AMBROSE WOODALL, F.R.C.S., who received a peerage on the King's Birthday, has taken the title of Baron Uvedale of North End.

WE regret to record that Dr. T. Izod Bennett, physician to the Middlesex Hospital, died on Wednesday last.

IT is announced that Lord Horder is to advise the flour-milling industry on medical and nutritional matters concerning flour and bread. He will join a team of advisers which includes Prof. E. C Dodds, F.R.S., director of the Courtauld Institute of Biochemistry, Middlesex Hospital, and Mr. T. Moran, D.SC., director of the British Flour Millers' Cereals Research Station at St. Albans.

---

[1] Notes on Malaria and its Control for Planters and Miners. Published under the authority of the Ross Institute Industrial Advisory Committee by the Malayan Chamber of Mines (Incorporated) and the Rubber Growers' Association (Incorporated), April, 1946. Pp. 61.

Special Articles

ROYAL SOCIETY EMPIRE SCIENTIFIC CONFERENCE

At the first morning session of the conference on July 3, eld in Oxford, the subject for discussion was

Nutrition

Prof. R. A. **Peters**, F.R.S., who was in the chair, uoted an article submitted by Dr. L. B. Pett which ointed out that "the nutrition problem is a medical ne consisting in the diagnosis of those individuals who ould benefit by improved dietaries. The solution of the roblem is providing these people with the information bout, and the means of obtaining, the necessary diets. n fact, however, there is still no sure way of diagnosing much of the malnutrition that may exist. . . . Under these ircumstances it is understandable that the nutrition roblem is still one of research on the one hand and of ather general public-health measures aimed at prevention n the other." Dr. Pett had called attention to the need or further research on nutrition in Canada, and for better oördination among those engaged on such research.

MALNUTRITION IN THE COLONIES

Dr. B. S. **Platt** (London) discussed the nutritional tudies of the indigenous peoples of the Colonies. It ad been thought necessary to find out whether a nutriional problem existed among the Colonial peoples, and or this there were two main methods: (1) data on nutriture could be obtained from clinical observations nd from relevant vital statistics; (2) data on food-consumption could be obtained from information concerning ood-production and importation, or from dietary surveys. Once the problem had been defined it was necessary to plan improvements and decide how the resources of land and labour could best be used to secure improved nutriion. This attack involved such matters as health, soil fertility, water-supplies, food technology, education, and administration, so any plan for improvement must be a combined operation. This combined effort could best be achieved through a local nutrition committee, with a technical staff coöperating to implement its scientific food policy. As a step towards assisting Colonial governments in this, ten dietists had already been trained to provide technical and other assistance to such committees. To illustrate the existence of malnutrition, Dr. Platt reviewed the work published since 1936. Many of the problems of malnutrition were of long standing, but not all; thus in Basutoland 967 cases of pellagra were reported in 1943, but this appeared to be a new disease in the territory, associated with a new method of milling. Pellagra is a troublesome problem in Hong-Kong, Nigeria, and the Gold Coast. Beriberi is still a common disease and cause of death in Hong-Kong and Malaya; in 1940 it was responsible for no less than 7229 deaths in Hong-Kong. Apart from these and other classical nutritional deficiencies, diseases partly attributable to malnutrition are frequent, including tropical ulcer and toxæmia of pregnancy. One of the clearest indications of the dependence of the infant's nutrition on the nutrition of the mother during pregnancy was the relationship of birth-weight to the total protein in the mother's diet during pregnancy. In some Colonies the average birth-weight increases with the social status of the mother. Infant nutrition in Colonial territories would be a profitable subject for research, and a start on these lines had already been made in the West Indies. The organisations that should be concerned in a nutrition programme in the Colonies, totalling about 15, included the Medical Research Council and the Colonial Office, with the Colonial Medical Research Committee linking them and acting through a subcommittee on nutrition. This subcommittee acted on the one hand through a field research station, and on the other through the Colonial territory staff, who included the 10 trained dietists already mentioned. The field research station was linked to the human nutrition research unit and to a field working party. The importance of research into Colonial nutrition problems needed no emphasis.

SOUTH AFRICA

Dr. E. H. **Cluver**, director of the South African Institute for Medical Research, pointed out that malnutrition was rife throughout Africa. Since tropical disorders of all kinds could be found in almost all parts of the continent, the ætiology of African nutritional disease was complex and its elucidation was very much a thing of the future. It was wrong to suppose that only further advances in fundamental knowledge were necessary—a more intensive study must be made of the application of such theories to the conditions among the different areas and races of Africa. Starvation occurred only rarely, but when found it caused even parliamentarians to react; the main problem however was one of unbalanced diet containing excess starch. In 1928 a commission of investigation had been set up by the government to investigate the problem of substandard Europeans and South Africans, usually referred to as "poor whites." These persons were unemployable because of their poor state of health, partly due to malnutrition. The problem was not only confined to "poor whites," and a nutrition council had been set up by parliament to define the whole problem. In 1928 pellagra had been reported in a Durban prison and cured by adding yeast to the diet. For many years scurvy had occurred in gold-miners put to work underground. Although there were 11 million Africans in the Union it was not possible to recruit from these the 250,000 that were needed for the gold-mines, because of their poor physique: more than half had to be recruited from outside the Union. A few years ago the Union health department of South Africa provided funds for the Cape Nutrition Survey, whose primary object was to establish reliable criteria for the recognition of human malnutrition. Coördination of this and other nutritional research in Africa should now be brought into effect. Existing knowledge should be applied and research extended; and it was essential to train a body of nutritional research scientists, adequate both in ability and numbers, to grapple with the vast unexplored problems that lie before us.

CEYLON

Prof. W. A. E. **Karunaratne** recalled that although malnutrition in Ceylon had had serious effects during the world economic depression of 1929–33, little or no attention was paid to the subject until Dr. Lucius Nicholls investigated phrynoderma in a Colombo jail; de Fonseca had already shown that this eruption reacted very favourably to cod-liver oil. It was soon recognised that other conditions caused by malnutrition were widely prevalent in Ceylon, and this led to a more elaborate nutritional survey undertaken by Nicholls in 1936. The defects caused by malnutrition were many, and included blindness; of 147 children in the blind school, more than 60% were blind as a result of keratomalacia due to severe deficiency of vitamin A. In a recent investigation in a large children's hospital in Colombo, Professor Fernando found that 72·9% of the children had clinical evidence of malnutrition, 16·1% having nutritional œdema. Rural dietary surveys conducted by Nicholls and Nimalasuriya in 1941 had also revealed a serious state of affairs. Since Ceylon is far from self-supporting in essential foodstuffs, a higher standard of nutrition demanded a greater development in agriculture and improvement in animal husbandry and fisheries. An appreciable increase in income was also essential. Other problems that would have to be taken into consideration included the extent of land that could be cultivated, the further development of irrigation, the prevalence of malnutrition, and the rapidly increasing population. In the last analysis, adequate nutrition is a matter of education and government.

DISCUSSION

Sir Joseph **Barcroft**, F.R.S., reminded the meeting that agriculture had been defined as the science of getting more human food from a given number of acres, and that the late Lord Keynes had suggested amending this to "a given number of acres and energy." The main problem was to link medicine and agriculture.

Khan Bahadur **Husain** (India) regretted that soya beans had been discouraged in his country, since in his view they could contribute a great deal to Indian economy.

Dr. D. M. **Blair** (Southern Rhodesia) regretted that food crops had been improved from the economic point of view but not from the nutritional: natives previously grew millet which would not sell and now grew white maize.

Prof. A. M. BLACKMAN (Oxford) stressed the importance of economics but believed there was no rational price for any crop.

Miss HARRIETTE CHICK, D.SC., gave an account of the work during the war of the Accessory Food Factors Committee of the Medical Research Council and the Lister Institute. Two tests on human requirements of vitamins A and C had vindicated the figures given by the League of Nations in 1937 rather than those of the National Research Council in 1941, which were three or four times higher. The committee had carefully considered the question of bread, and its two memoranda published early in the war had had a great effect on food policy.

PRACTICAL APPLICATION OF KNOWLEDGE

In opening the second session the CHAIRMAN said that the communications already delivered had clearly proved the existence of a nutrition problem in the Empire, and he regretted that many thousands of cases of beriberi occurred when synthetic vitamin B_1 was available in large amounts.

Mr. A. GLENDON HILL, PH.D., director of the East African Agricultural Research Institute, read a paper on the selection and improvement of food plants. He believed that one of the strongest arguments in favour of undertaking plant breeding at the earliest possible date was that it provided the only scientific method whereby increased crop yields per acre could be achieved without at the same time changing agricultural methods or making greater demands on the cultivator. But the shortage of plant breeders was likely to prove the main hindrance to progress for some time to come. The primary consideration was yield of food per acre and not per ton of produce. One of the first items in a programme of plant breeding should be a survey of the vast number of existing food-crop varieties in our Colonies, about which much had still to be learned.

Mr. HERBERT H. BROWN, PH.D., director of Fisheries Investigations. West Indies, discussed food available from Colonial fisheries; and Mr. R. DAUBNEY (East Africa) dealt with improvements necessary in animal husbandry.

Dr. G. A. C. HERKLOTS (Hong-Kong), who spoke with practical experience of malnutrition as a prisoner-of-war of the Japanese for nearly four years, wished to see the production of fish increased, but believed that the nutrition and happiness of the Chinese depended on the green vegetables they produced. He had introduced a new idea in Hong-Kong by starting a " balanced food factory." It was possible to obtain from this balanced meals and supplements such as enriched biscuits containing vitamins of the B complex, calcium, iron, and shark-liver oil. This practical note was continued by Colonel Sir S. S. SOKHEY, the only medical delegate from India, who wished to see direct lines of ways and means for putting into action our present knowledge; he was a little sceptical of Dr. Platt's diagram in which a large number of agencies were joined to one another in circles. He would have liked to break the circles and apply at once our present knowledge to feeding the people.

Sir EDWARD MELLANBY, F.R.S., reminded the meeting that in agriculture the farmer was in control, and in medicine the scientist was in control; coördination between the two was required. We could carry on independently of the agriculturists and had done so in the past with great effect—calcium, iron, and food yeast were examples—but such isolated action was not the true goal, and the problem of malnutrition must be tackled at once by a combination of the medical and agricultural scientists.

A NEW monthly journal, *Nutrition and Child Welfare*, should prove useful to those who have care of children, including health visitors, school nurses, midwives, nursery matrons, and nursery-school teachers. The first issue contains articles by Prof. Alan Moncrieff, Dr. Ursula Shelley, and Dr. R. P. Cook, as well as a discussion by Dr. G. E. Breen, the editor, on the pasteurisation of milk. This journal may well fill the place of *Maternity and Child Welfare*, which unfortunately came to an end in 1934—an informative little publication which could still provide a useful pattern in some respects. We wish Dr. Breen, and Miss Alma Fox, the nursing editor, success in this new venture.

THE WORLD HEALTH CONFERENCE

FROM OUR SPECIAL CORRESPONDENT IN NEW YORK

WITH the preliminaries of the first three days over,[1] the conference began its first full week of work on Monday, June 24, with the addition of delegations from the U.S.S.R., the Ukraine, and Byelo-Russia, an observer from Hungary, and three other delegations who had been delayed en route.

Five working subcommittees were set up, in accordance with the proposals of the expert committee in Paris—namely, on the scope and functions of the Organisation (chairman, Dr. Shousha Pasha, Egypt); on administration and finance (chairman, Dr. G. B. Chisholm, Canada); on legal questions (chairman, Dr. Karl Evang, Norway); on relationships with the United Nations and other organisations (chairman, Dr. A. Gabaldon, Venezuela); and on regional arrangements (chairman, Dr. W. Timmerman, Netherlands). In addition, a general or steering committee was set up to meet daily and control the work of the conference.

At the beginning of the week things moved very slowly and a great deal of time was lost in procedural details. Many of the delegates lacked experience, and their volubility was often in inverse ratio to the importance of the State they represented. Thus a delegate from a country with very recent and dubious claims to statehood distinguished himself by making three speeches followed by three retractions! Also the chairmen rightly felt that any limitation of the discussions might reduce the enthusiasm with which delegates would further the acceptance of the conclusions of the conference on their return home. A third cause of delay was an obvious failure of the secretariat in certain directions such as interpreters and distribution of documents; though this should be laid at the door of the U.N. secretariat rather than the ad-hoc conference secretariat under the direction of the secretary to conference, Dr. Yves Biraud.

However, a shade temperature of round 90° in the Bronx—" The only difference between New York in July and Hell is that the rent and humidity are higher in New York "—and the desire of delegates to get back to their posts within a reasonable time, led to a minor revolt in the middle of the week. The steering committee tightened things up and some real progress began to be apparent. By the end of the week it was at least clear what were the main subjects of disagreement, and that these broadly were the same as those disclosed in Paris. While it was generally conceded that membership should be open to all, the delegates from Russia expressed the hope that Spain, for instance, would not be admitted, and most delegates felt that responsibility for excluding any State should be placed on a political body such as the U.N. Assembly and that the Health Organisation should keep clear of politics. It was agreed that the governing body of W.H.O.—whose name was changed from ". conference" to "assembly"—should be composed of three, not one, delegates, with alternates and advisers, and that these should " preferably " be drawn from the health authorities of their countries. A new point, as yet unsettled, was raised in a proposal that dependencies, such as colonies and trustee territories, should be admitted to the assembly as associate members: most delegates thought that this would make an already unwieldy body completely unworkable, and favoured representation of dependencies at the regional level. Views on the entry into force of the convention establishing the new World Health Organisation varied from a Yugoslav proposal that it should require ratification by 20 members of the United Nations to the original proposal in Paris for 15 signatures. The former proposition carried the day in committee, and it seems clear that an interim commission will have to be set up until such time as the permanent organisation is established.

As in Paris, the greatest difficulty arose on regional organisations and notably the position of the Pan-American Sanitary Bureau. The Latin American bloc refused to consider putting the bureau under the control of the new W.H.O., and the U.S. delegation felt bound to support this somewhat parochial view; but the question is still far from decided.

---

[1] See *Lancet*, June 29, p. 970.

Public Health

Salaries of Health Medical Officers

INTERIM REVISION OF ASKWITH SCALES

REPRESENTATIVES of the parties to the Askwith agreement on salaries met in London on March 26, and accepted an interim revision, whose terms have now been published.[1] The recommendations of the Askwith memorandum are to continue as an interim measure, with the following adjustments, dating from April 1, 1946, which are additional to any existing war bonus.

(a) Incremental scales (i.e., the rates of pay quoted in the memorandum for resident medical officers, medical officers employed in departments, senior medical officers, medical superintendents of institutions other than mental hospitals, and assistant medical officers to mental hospitals) shall be increased throughout the scale as follows:

(i) If the minimum of the scale does not exceed £700, by 30% of that minimum;

(ii) If the minimum of the scale exceeds £700 but does not exceed £1000, by 20% of that minimum;

(iii) If the minimum of the scale exceeds £1000, by 10% of that minimum.

The rate of pay of £1100 quoted in the memorandum as the rate not to be exceeded for senior medical officers or medical superintendents of institutions other than mental hospitals shall be increased by 10%.

(b) The minimum commencing salary of other rates of pay (i.e., for deputy or chief assistant medical officers of health, for medical officers of health, and for combined posts) shall be increased:

(i) If it does not exceed £700, by 30%.

(ii) If it exceeds £700 but does not exceed £1000, by 20%.

(iii) If it exceeds £1000, by 10%.

Medical officers already serving in posts covered by the Askwith memorandum on April 1, 1946:

(1) If they are in a post to which paragraph (a) above applies, and if they are receiving not more than the maximum of the present scale embodied in the Askwith memorandum, shall be given from that date an increase of pay equal to the appropriate percentage of the minimum of the present scale indicated in paragraphs (a) (i), (ii), or (iii), as the case may be; and if they are receiving a rate of pay in excess of that maximum but less than the maximum of the revised scale, shall be given an increase of pay which will bring them to the revised maximum.

(2) If they are in a post to which paragraph (b) above applies, and if their salary does not exceed the appropriate minimum embodied in the memorandum plus 20%, shall from that date have their salary increased by the appropriate percentage of the minimum indicated in paragraphs (b) (i), (ii), or (iii), as the case may be.

In respect of all categories, marginal adjustments shall be made to ensure that an officer shall not receive, as a result of the new arrangements, either less than an officer in a post to which at present a lower rate of pay applies, or less than he would have received had his rate of pay been lower than that which he at present receives. In cases where present salaries are such as to disqualify their recipients, either in whole or in part, from receipt of the salary increases now agreed, local authorities have discretion, in some cases with the consent of the Minister of Health, to review existing rates of remuneration.

EFFECT OF RECOMMENDATIONS

The following examples show increases of pay to which officers are automatically entitled under the new arrangements. Local authorities have discretion to pay higher rates in appropriate cases; but the new arrangements do not relieve certain local authorities of their responsibility for obtaining the approval of the Minister of Health to revised rates of pay.

Resident Medical Officers.—The minimum commencing salary (hitherto £350, rising by annual increments of £25 to £450 per annum) is to be £455, rising by annual increments of £25 to £555 per annum, with emoluments which shall include board, lodging, laundry, and attendance. Thus a salary of £400 on the old scale would be automatically increased to £505, and a salary of £500 (above old maximum) would be increased to £555 (new maximum), while a salary of £600 (above new maximum) would be subject to no automatic increase.

Medical Officers employed in departments.—The commencing salary is increased from £500 per annum to £650 per annum, rising by annual increments of £25 to a maximum of £850. A salary of £600 per annum on the old scale would thus be automatically increased to £750; and a salary of £800 (above old maximum) would be increased to £850 (new maximum).

Senior Medical Officers.—The minimum initial salary is to be increased from £750–£1100 to £900–£1210, with an increment of £50 every two years up to a maximum which shall be calculated by adding to the maximum of the old scale payable under the Askwith memorandum the appropriate percentage (in accordance with paragraph (a) (ii) or (iii) of the interim revision) of the minimum of the old scale; but no salary in this scale shall exceed £1210 per annum until 4–5 years after the maximum on the scale is reached, at which time the employing local authority shall consider whether the salary should be increased beyond the maximum.

Medical Superintendents of institutions other than mental hospitals.—By the new scale, the minimum is increased, for an institution not exceeding 150 beds, from £750 to £900–£1087 10s.; and corresponding increases are made for larger units, the minimum salary for units larger than 700 beds rising from £1100 to £1210. All officers receive every two years an increment of £50 to the specified maximum, but no salary shall exceed £1210 per annum except after 4-5 years on the maximum salary in the scale, when the employing local authority shall consider a further advance.

Deputy of Chief Assistant Medical Officers of Health.—The new minimum commencing salaries range, according to population, from £624 for a population not exceeding 50,000, to £1152 or £1200 for populations above 750,000.

Medical Officers of Health.—The increase is in the same proportion as for assistant medical officers of health.

Combined posts.—Where an assistant medical officer under a county council acts as a district medical officer (for either a single or combined district) for a definite proportion of his time, he shall receive by way of total salary not less than the minimum commencing salary of a whole-time medical officer of health, as indicated by the population of the district or combined district. The officer shall not in any case receive a salary of less than £960 per annum.

Assistant Medical Officers to mental hospitals.—The minimum commencing salary is increased from £350 to £455, rising by annual increments of £25 to £555 per annum, with emoluments which shall include board, lodging, laundry, and attendance. It is desirable that suitable provision should be made in connexion with every mental hospital for the accommodation of married assistant medical officers.

Infectious Disease in England and Wales

WEEK ENDED JUNE 29

Notifications.—Infectious disease: smallpox, 0; scarlet fever, 1063; whooping-cough, 2073; diphtheria, 313; paratyphoid, 9; typhoid, 6; measles (excluding rubella), 4177; pneumonia (primary or influenzal), 440; cerebrospinal fever, 39; poliomyelitis, 8; polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 123; puerperal pyrexia, 125; ophthalmia neonatorum, 70. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 1 (1) from measles, 7 (2) from whooping-cough, 2 (2) from diphtheria, 42 (9) from diarrhœa and enteritis under two years, and 5 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 276 (corresponding to a rate of 30 per thousand total births), including 37 in London.

---

[1] *Salaries of Whole-time Public Health Medical Officers: Interim Revision of Askwith Memorandum.* H.M. Stationery Office, 2d.

In England Now

A Running Commentary by Peripatetic Correspondents

THE world is getting smaller every day, as they were fond of telling us in our youth. In our grandfathers' time a partial failure of the Nile floods in lower Egypt could have no effect on England, and it is doubtful if severe floods in the Severn valley or a volcanic eruption in Wales would have done London any harm; but today, because the rains have failed in South India and there has been a war in Burma, we are compelled to have more severe rationing in England than we ever had even when we were at war. The strange part of this is that all the rationing is voluntary. Were we to permit ourselves to buy in the open market most of it would be unnecessary. Were we prepared to let the population of Europe starve as a result of the war Germany itself started, the population of England could live far more comfortably. It is pure humanitarianism that is responsible for our present low rations, and it is greatly to the credit of the British housewife that such a state of affairs exists.

In diverting food-supplies to India other factors have to be considered. There has been no complaint at letting some hundred thousands of tons of food be diverted to India to help in the famine; but I am afraid that if this state of affairs occurs in India too often there will be less sympathy than there is today. If India continues to increase its population by five million every year it will constantly be calling on the world for supplies, and in time the world will ask why India cannot kill off its millions of useless cattle that are now kept on cultivatable ground, not because they perform any useful purpose or supply meat or milk to the starving millions but merely because they are sacred animals which no good Hindu could possibly kill. Sympathy may be a thing to be encouraged but there is a lot in the old saying that charity begins at home.

* * *

A spell of quasi-Mediterranean sunshine enables one to spend the luncheon-hour in the embankment gardens at Charing Cross, absorbing calories parenterally and listening to the band. The shirley poppies are at their best, and the dahlias are coming on nicely. The only fly in the ointment, especially if one is listening to the music, is the proximity of the railway. A beautiful finale, with soft notes fading away to nothing, was interrupted by a piercing whistle from a light engine on Hungerford Bridge. A few minutes later the Irish Guards were playing *Chin, chin, Chinaman*, and, when they came to "chop, chop, chop," the railway guard, not to be outdone, started his train off, in perfect rhythm, with "Puff, puff, puff"—which went on long after the band and caused a wave of merriment to ripple through the crowd, supporting the theory that the basis of a joke is the juxtaposition of the incongruous.

* * *

When I was a young man and a guest among my seniors I was sitting at dinner beside the accomplished neurological physician of those days. Our talk included the different ways in which enterprising practitioners tried to get patients. He told me of a fashionable doctor who button-holed two men separately at a dinner party and told both that they did not look too well and that he could put them right. They were so impressed that they decided to consult him, but they happened to arrive on his doorstep at the same moment. Before ringing the bell they had a little conversation together, decided they were victims of a plot, and went home without more ado.

My neighbour went on to tell me of two consultations a famous consulting physician had with a general practitioner who called him at different times to see the wives of two conductors of orchestras. The first was a heart case, and the consultant remarked that the profession of the husband probably had something to do with the musical murmur he found. The second case was one of intestinal obstruction and the general practitioner reminded his consultant of his little joke and said it would puzzle him to link this condition with the husband's job. "I'm not so sure," said the consultant, "I strongly suspect the trouble is due to a band."

Higher exams are becoming like wine: there are good and bad years. Diplomas 1946 (anyway the D.X.Y.) must be recorded as a good year. Those who got one might, with justifiable pride, put "D.X.Y. (vintage '46)" after their names, because the standard has suddenly become hot-stuff. Won't old Bevan be in the soup in a couple of years' time when he finds he hasn't got the little graded.specialists that were found to be so necessary and to have done quite good work in the Services. The trained psychiatric social worker is a rare avis now, through just the same policy of insisting on a very high standard. The result? Oh, merely that many patients get no attention at all instead of quite a lot, albeit a little inferior.

* * *

As soon as I saw him, I knew he had to be called Wilbur. He was a large bright green affair, a German synthetic effort with ferocious hairy antennæ and protuberant yellow eyes. I doubted whether there was ever a fish so greedy as even to contemplate Wilbur, let alone stomach him. Still, I decided to try him out on the local lake, after having mellowed him a little with a long soak in flavine. Wilbur took off optimistically enough, winging the air ahead of the catgut, looking perhaps most like a semi-metamorphosed tadpole out of cockroach (as they say in horse-breeding). I hoped the trout would not mind his exophthalmos, or his slightly sea-sick depressed expression. Poor Wilbur; though his take-off was so perfect, he did not stay up long, but landed (owing to my suddenly noticing half a platoon of young Germans watching the exhibition with keen interest) on the seat of my trousers B.D. A hasty tug only drove him deeper into the material. It was difficult to maintain an air of calm superiority and equanimity, as if the proceedings were necessary parts of the operation of launching a fly, with Wilbur nestling deeper at every tug into one's posterior. I tried humming the theme of the Allegro con brio from Beethoven's eighth symphony, to show my unconcern at the complication. But the ageless music had no impression on my audience, who, no doubt, would have stopped scrutinising Wilbur immediately had I been able to give them "Brooklyn Boogie," or the like. It all ended with Wilbur winning the wrestle. The gut parted, leaving the wretched animal in situ. I could but try again with float and worm. These I got safely into the middle of the water, though the proceedings used up my last reserves of nonchalance. The one thing I cannot do (besides jeep-driving and fuse-mending) is to hook a worm through its cold vital wriggling clitellum.

The Empire will never know at what expense I kept the old flag flying.

* * *

They jammed on Sunday at about 6 P.M. Jammed at red against the traffic in a double three-lane main road, in favour of green for the traffic in a practically unused side-road. The traffic surged up against this stop fairly evenly from both directions most of the time, but there were ding-dong periods when the tail end of one light-crashing direction was so obviously crashing that the head of the facing direction twigged what was going on and crashed them too. I omitted these periods, and also the two occasions when a kindly old gentleman told the leading cars that the lights had stuck, and so vitiated the experiment. I made 25 readings of the interval, taken from the time that the first pair of cars faced each other to the time one leader decided to crash the lights; these averaged 42 seconds, the variability being from 23 to 66 sec. Additional observations suggest that taxis are no different from other vehicles in their readiness to crash lights, and that the exhaust from a jeep is so placed as to enable the passenger to warm his hands in the hot gases as a small child trails his fingers in the water when boating. So now you know; the A.M.I. (average motorist impatience) is 42 sec.

* * *

". . . he got very excited and energetic and gave up his job and started leading hunger-marchers and things until he was obviously quite ill so they cut his throat and took out seven-eighths of his gland but they had to leave some behind so he's still a bit of a Socialist I'm afraid but not nearly so violent. . . ."

Letters to the Editor

"TROPICAL" DISEASES

SIR,—In classification and nomenclature accuracy is as necessary as in other departments of medical and scientific thought. Where a descriptive adjective conveys the idea of the ætiological origins of a disease it is particularly important, since inaccuracy may not only perpetuate false attitudes of mind but may even hamper or postpone an effective attack upon the disease.

There is a large and important group of diseases to which the generic label "tropical" has long been attached. We have our textbooks of "tropical" medicine, our schools of "tropical" medicine, and our diplomas in "tropical" medicine and hygiene. All this suggests (not inappropriately *today*) that the diseases in question are confined to, or at least peculiarly prevalent in, tropical countries. There is, however, a further suggestion implicit in the label (although experienced workers in the field will scarcely endorse it) that geography and climate have a predominant ætiological responsibility for them. Of most of the major and more prevalent diseases concerned this is not strictly true.

Plague, cholera, malaria, typhus, typhoid, the dysenteries, leprosy, hookworm, pellagra, beriberi, have all occurred and sometimes flourished (and can still occur) in temperate climates—not excluding our own islands and the U.S.A. They flourish when and where social conditions are bad, and depart as they are improved. Climate, season, weather, and some natural environments obviously play their part in ætiology (they particularly give scope to certain vectors) but, while these influences remain uncontrollable, the scourges can be made to disappear. They are due, in fact, to varying combinations of poverty, filth, malnutrition, overcrowding, conditions of work, ancient religious customs, and social habits and ignorance of or failure to enforce sanitary laws. In fifty or a hundred years' time, tuberculosis may well have become a rare disease in England, but it will still probably be common in India. Should we in that event re-label it as "tropical"?

In common with tuberculosis and syphilis and rheumatic heart disease, each of these "tropical" scourges may be said to have its own social pathology, a pathology which is nowadays becoming by degrees more clearly appreciated and defined.

Our great pioneers in "tropical" research (whether in the case of communicable or nutritional disease) were among our greatest pioneers in social and preventive medicine. The focus of attention in teaching and research during the present century has, however, been directed too exclusively towards the laboratory and hospital investigation of these diseases—to their study in detachment from the conditions which encourage them. This is not to say that sociological studies and preventive measures have been everywhere neglected, but —excepting when war requires the protection of troops and effective measures of control have had to be rapidly devised or developed—their importance has certainly been underestimated.

Not dissimilarly at home, the emphasis of research and teaching has been more and more on the problems of the clinic and the laboratory and especially upon an elaborate bedside pathology. The result has been that we have been training doctors with little or no interest in social pathology and hygiology. The newly qualified, for the most part, embark upon their careers with small appreciation of the possibilities of preventive and constructive medicine and of the importance of that close association between the remedial and public-health services which is essential to the progress of medicine and the success of any full national service. To find the same apathy about the social factors in disease among doctors and students in the medical colleges and schools of India—where many millions die annually from the prevailing community diseases—is an arresting experience, even if reasons for present failure are not far to seek. East and West, it is clear, have both been labouring under the same limitations and handicapped by a too restricted pathological method and understanding. Medicine as a social science has a very long way to go.

Perhaps it is too much to suggest that our special textbooks and institutes should be renamed, but until we replace the false concept that the environment of geography and climate has major ætiological significance by the truer concept that social environment is in the main responsible for man's most widespread and most crippling diseases in all parts of the world, we shall not be doing our best in preparation for the new age of medicine which is surely coming.

Since we have a direct or indirect controlling interest in the matter of health for a very large area of the globe, this concept must come to influence more largely our research and undergraduate training in all existing and newly projected medical schools in this country and the dominions, and more especially (while we retain responsibilities there) in India and the Colonies. The fact that adverse social factors are often difficult to remove is no argument for retarding the study of their correlations with sickness and mortality or the general and sanitary education of peoples.

Oxford. JOHN A. RYLE.

C.CM. OR MILLILITRE?

SIR,—In your last issue Dr. G. E. Beaumont, commenting on my letter in your issue of June 29, mentions that syringes are usually marked in cubic centimetres instead of millilitres. This method of marking is regrettable, and manufacturers should remedy the defect and would doubtless do so if clinicians insisted upon syringes being properly marked in millilitres. Until syringes are so marked the clinician should not continue the error by recording volumes in cubic centimetres but should convert his readings into millilitres by using as a conversion factor, unity, which is quite accurate enough for all medical purposes. Dr. Beaumont calls attention to the smallness of the difference between a cubic centimetre and a millilitre; but if, in spite of this, he feels any qualms of conscience about using unity as a conversion factor he could state that he used a syringe graduated in cubic centimetres which he had converted into millilitres by using this factor. For work requiring extreme accuracy the conversion factor would be the reciprocal of 1·000027, but Dr. Beaumont need not concern himself with this refinement which is far beyond the limit of accuracy of any syringe.

Apart from the actual difference in volume between the cubic centimetre and the millilitre, the fundamental reason why the cubic centimetre should not be used as an alternative to the millilitre is the fact that there is no connexion between these two units. It is interesting to note that the kilogramme-litre system of measurement (though decimal in character) has been divorced from the metric system. The cubic centimetre, however, remains in the metric system and is quite correctly used as a measure of volume when this has been determined from linear measurements. But it must be definitely stated that the cube of a unit of linear measure, as a mode of expressing volume, has no derivative or cognate connexion with the litre or any of its aliquot parts.

London, S.W.7. J. M. HAMILL.

TANNIC ACID FOR HAND BURNS

SIR,—Your review (March 9) of Marc Iselin's *Chirurgie de la Main* expresses surprise at tannic acid being used for burnt hands.

It is true that bad results have often followed coagulation methods in the treatment of burnt hands, and experience has proved that tannic acid is unsuited to military surgery, in which the potential dangers cannot easily be controlled. There is, moreover, a definite (though slight) risk of tannic acid absorption causing liver damage. Nevertheless, I believe there is no reason why tannic acid should not have some usefulness in civilian practice, where conditions are quite different from those of war.

My experience covering many cases of all types has been that tannic acid has not only proved perfectly satisfactory in properly selected burns of the hand, but has, on the whole, given quicker and better results, with a lower rate of infection, than any of the other methods at present in vogue; and I should be very loth entirely to abandon it until some genuine therapeutic advance is made.

Tannic acid is undoubtedly particularly dangerous if applied to deep hand burns; and the application of hot air is most undesirable since it produces desiccation and contraction of both the tan and the tissues, and possibly causes additional thermal trauma.

In assessing the indications for treatment the following classification has proved useful:

1. *Erythema.*—Emollients only are necessary.
2. *Vesiculation.*—A benign burn in which recovery is almost independent of the treatment, provided this is not actually harmful.
3. *Bullæ containing fluid with a high protein content.*—These may burst, leaving a red weeping surface from which protein and fluid continue to be lost. The epithelium is severely damaged but is capable of recovery.
4. *Deeper burns.*—Here heat has destroyed the epithelium. Unless small, they must be grafted because they can only heal from the periphery, and if coagulated they are particularly prone to infection since the coagulum is virtually a foreign body.

Most burns of the hands and forearms are in groups 2 and/or 3. Tanning gives excellent results. Pain is relieved; movements can be carried out at once, unencumbered by dressings; and the resulting healed skin is of excellent texture. Circumferential burns are always of the 4th group on the dorsum, and this rather than the risk of constriction contra-indicates tanning.

Rapid tanning without constriction can most efficiently be obtained by the use of dry powders, which are superior to solutions. After suitable cleansing with detergents and antiseptics, and mopping quite dry, the following powder is dusted on lightly with a swab: tannic acid 20%, talcum 20%, sulphanilamide 60%. A single application only is required, and the coagulum, which is very thin, is produced at once. It dries in about two hours, according to the temperature and humidity.

It was once remarked that the results of burn-treatment depend not so much upon how the burns are treated as upon who treats them. Some American journals in reviewing new books append the names of the reviewer. The adoption of this practice in British medical literature would, I am sure, be welcomed by many readers.

Palestine. F. V. STONHAM.

FURTHER CHALLENGE TO THE MEDICAL ACT

SIR,—You were good enough to allow me (March 9) to draw attention, during the passage of the National Insurance (Industrial Injuries) Bill, to a motion tabled by a group of Socialist back-benchers, who sought to leave to the discretion of the Minister the selection of persons who should be eligible for inclusion in the list of persons authorised to give medical treatment under new legislative proposals. The Minister of National Insurance avoided discussion by declaring that the motion should be more properly addressed to the Minister of Health when the Health Bill came before Parliament.

Your heading to my letter described this motion as a "challenge to the Medical Act." I want now to draw attention to a new challenge to that Act under clause 42 of the National Health Service Bill; the report in *Hansard* of the proceedings of committee C, when clause 42 came up for consideration, demonstrates, by the long debate which ensued, the importance which is attached to this renewed challenge to that Act. The rubric to clause 42 declares that it deals with "disqualification of practitioners," and the practitioners concerned include, in the words of the white-paper (clause 69), "doctors, chemists, dentists, and opticians"!

The tribunal is to consist of a barrister or solicitor as chairman, appointed by the Lord Chancellor, and two other members appointed by the Minister. To this tribunal is given the right of disqualification of practitioners, and appeal from this tribunal to the courts is disallowed, the Minister being given the final decision in the matter. The consequent injury to the practitioner thus dealt with may be even more serious than the injury now resulting to the practitioner who is removed from the Medical Register. Such removal does not disqualify from practice, as does removal from the public service by the tribunal, and reversal of G.M.C. decisions by the High Court is not ruled out, as the recent cases of Drs. Spackman and Hennessy demonstrate. They were able, it is true by indirect methods, to secure such reversal, and to resume practice. I understand that in the earlier history of the Medical Act, 1858, direct appeal to the courts from G.M.C. decisions was not infrequent, and fell into abeyance through the action taken by the High Court itself, which explicitly discouraged such appeals, as for instance in the memorable judgment given by Lord Bowen, who declared that "providing due enquiry had been made by the Council, the jurisdiction of the Domestic Tribunal, which had been clothed by the Legislature with the duty of discipline in respect of a great profession, must be left untouched by courts of law."

If clause 42 survives the report stage, as seems inevitable, the professional life of the doctor of the future will be far more insecure than it is now under the exclusive jurisdiction of the much-criticised G.M.C. The issue, just published, of the Health Bill, as amended by standing committee C, allows of a comparison of the amended with the original draft. The most material, and indeed practically the only, change observable in clause 42 of the Bill as it has passed the committee stage is the omission of section 4 from the original version, which provided for an appeal to the Minister.

It is clear that the voting strength of the Socialist party has been ruthlessly exercised in the proceedings of committee C. The Bill, as amended, emerges with but little, and that insignificant, change.

House of Commons,
London, S.W.1. E. GRAHAM-LITTLE.

COMPULSION FOR DOCTORS

SIR,—Socrates said that no wise man indulges in politics—or words to that effect. May, however, a conservative liberal, with socialistic tendencies, make an exception, and express his thoughts on the present medico-political situation in your valuable pages?

In support of the proposed State medical service, much is made of the need for the compulsory direction of doctors to practise in areas insufficiently provided for medically. Of course, until the community is organised into uniformity, with an exactly equal proportion of doctors, lawyers, grocers, builders, &c., per thousand of the population in every area, there may be some regions with a slightly higher or lower proportion of one or other of these professions. But, generally, most areas have naturally attracted to themselves the most suitable number of each of these classes of workers. If, however, in the case of some possibly unattractive region, doctors have exceptionally not followed the needs of the population in sufficient numbers, it is always open to the local authority to increase the attraction by the bait of a free house or other reward.

For this natural evolution is proposed the substitution of compulsion to practise in a given area against one's inclination, the money which might have served as an inducement so to practise being diverted to the army of bureaucrats who will do the compelling. For, under the State system, the doctors, who, after all, will do the work, will have to accept a lower financial return, in order to pay for the necessarily gigantic bureaucratic machine.

This measure of political sadism, so alien to British tradition, is being hurried through in a moment of national mental aberration, perhaps induced by the fatigue of war.

Under the pretext of improving the national health, the thin edge of the totalitarian wedge is being aimed first at the medical profession, since doctors, being individualistic, and having no union, but only an association, are an easy prey. Once they are enslaved, the other professions and trades will surely follow them to slavery.

It would, of course, have been impolitic to start with a campaign for a State legal system, as there are too many lawyers in the House of Commons.

It is interesting to note the enthusiasm in trade-union circles for this dictatorial medical scheme, possibly due to a failure to realise that this is the first step towards a dictator State, and to forgetfulness that under full totalitarianism, as in Fascist Italy and Nazi Germany, the trade-unions were suppressed.

Incidentally the big annual financial contributions which everybody will have to make, in order to enjoy this "free" medical service, will enable those who for years have not needed medical attention to say, "Never before have so many paid so much for so little."

May sanity return before it is too late.

London, W.1. ALEX E. ROCHE.

SPONTANEOUS MESENTERIC VENOUS THROMBOSIS

SIR,—The following case of recovery after resection, without heparin, seems worth reporting.

A baker, aged 53 years, 5 ft. 4 in. in height and weighing 12½ st., first complained of abdominal colicky pain, with the passage of two loose stools without blood, on Nov. 6, 1944. Temp. 99·0° F, pulse-rate 72. Abdomen (difficult to palpate owing to obesity) was distended, without definite tenderness.

Nov. 7.—His condition was the same, but temp. 98·4° F, pulse-rate 72. Bowels not opened.

Nov. 8.—Turpentine stupes and enema produced small fæcal result without blood.

Nov. 9, 10, and 11.—He appeared to improve in that his appetite returned and he wished to get up.

Nov. 13.—His improvement was maintained in the morning, but in the late afternoon he complained of severe epigastric pain, with profuse sweating, and he vomited a little bile. I sent him into hospital as ? intestinal obstruction or ? mesenteric thrombosis.

Nov. 14.—His condition was reported to have become more acute, and laparotomy was performed by Dr. Joseph Chalmers, who resected 2 or 3 ft. of lower ileum, which were completely gangrenous as the result of mesenteric thrombosis.

Recovery was uneventful except for some œdema of both ankles, which persisted until January, 1945. He has now long been back at work, and has apparently completely regained his normal health.

Keighley. WRIGHT LAMBERT.

HEARING-AIDS

SIR,—When one has built up a business and goodwill by exceedingly hard work, it is galling to learn of the statements of Government spokesmen who are, unfortunately, not properly informed by the departments and are apparently using every effort to smash what one has built up over many years. I am referring to the propaganda relating to the Government hearing-aid and I would be grateful if you would print some of the facts as a corrective to the misleading statements which have been made. The relevant facts are:

(1) The present disclosure of the exploitation of the deaf ignores that there is a most reputable section of the hearing-aid industry subscribing to the rigid code of conduct laid down by the National Institute for the Deaf.

(2) The propaganda is harmful to the reputable and disreputable, whereas it should be designed to clear out the latter.

(3) My own company have supplied 20,000 hearing-aids by personal recommendation alone, all after trial before purchase.

(4) Every Amplivox hearing-aid has a crystal microphone and three valves as per the Post Office specification.

(5) We were making amplifiers measuring only 3 in. × 2 in. × 1 in. in 1937. The Government hearing-aid having an amplifier of this size is stated to be revolutionary.

(6) We made hospital hearing-aids for as little as £6 in 1938.

(7) The hearing-aid industry produced in 1943 a specification for a British standard hearing-aid to sell at £10 10*s*. The plan was held in abeyance because of lack of Government support.

(8) The British-made valve-amplified hearing-aid gives better results and is more reliable than any other hearing-aid in the world today and is exported to every country throughout the world.

The hearing-aid industry, with its hard-won knowledge in this difficult field, has not so far been consulted in connexion with this Government scheme.

A. EDWIN STEVENS
London, W.1. Governing Director, Amplivox Ltd.

SIR,—Some of the information contained in your report of June 29, on the 'Bonochord P.4' hearing-aid, is not now correct. You comment that the high-tension battery is difficult to get, but in point of fact it has been listed by the Ever Ready Co. as a standard product, obtainable from radio and electrical stores, for the last three months. You also comment that the meatal receiver supplied for test was not working. This is not correct. The earpiece was supplied in working order, but when the instrument was returned to us the adjustment on the earpiece had been moved, bringing the diaphragm hard down on the pole-pieces, thus making the earpiece ineffective.

The current model has new type miniature valves, also a reduction in low-tension cost, providing twenty hours of life from a 9½*d*. cell, as opposed to the previous low-tension battery which gave twenty hours of life from a 1*s*. 9½*d*. cell. In addition, the instrument has been improved by incorporating both batteries in a single miniature pack, and by increasing both the top response and the output of the aid.

T. CONSTANTINE
Managing Director, Allen & Hanburys
London, W.1. (Acoustic Aids) Ltd.

NURSING

SIR,—When I read Mr. Sol. Cohen's article on Democratic Nursing, I experienced that exhilaration which comes from finding one's own thoughts and feelings expressed with brilliance and felicity. Even in these days, though more rarely than formerly, I find myself acutely embarrassed by the method of address adopted by a few senior sisters to junior nurses. I contrast it with that natural charm with which my wife treats those who work in our home, and I realise that it is just that quality in the director that makes for smooth running, efficiency, and happiness in any community.

I have been a patient in many wards, mostly in military hospitals, and if ever I become a patient again, I pray that the fates will land me in a ward where the sister in charge is prepared to sacrifice a ha'p'orth of efficiency for a pound of humanity. In my own hospital I have in mind a ward where laughter and happiness prevail, but where I suspect meals may sometimes be ten minutes late and from where pillow-slips and crockery may be occasionally unaccountably mislaid.

Apart, however, from this aspect of the nursing problem, there is another point about which I feel very strongly, and that is the training of the theatre nurse. The standard of assistance in the theatre in the teaching hospitals up and down the country is lamentably below an adequate standard. This is not the fault of any person but of the system. "Doing instruments" and assisting at operations are specialised and isolated parts of nursing and demand qualities and interests quite different from those needed for the nursing of sick patients. A good ward nurse may be a bad theatre nurse, and vice versa. Because of shortage of staff, many excellent ward nurses, who for one reason or another have not got their hearts in theatre work, are transferred from the wards, where they are doing a first-rate job, to the theatres where, to their own and everyone else's exasperation, they find that they are woefully inefficient. Theatre nursing is a profession in itself, and it should be possible to train nurses for it and for it alone. If this were done, it would encourage girls to enter the nursing profession who shrink from the domestic and menial side of the duties of the ward nurse; it would ensure a prolonged and adequate training of the theatre nurse with immeasurable improvement in efficiency; and it would save depleting the ranks of those nurses whose whole instincts prompt them towards human contacts and whose kindness, even tenderness, towards their patients are the brightest stars in the nursing firmament.

Guy's Hospital, London, S.E.1. H. J. B. ATKINS.

CULTURES IN FEMALE GONORRHŒA

SIR,—The details given by Dr. Walker in her letter in your last issue seem to require no comment from us, except our congratulations to the department concerned on the high standards which have been maintained. At the same time perhaps we should make it quite clear that our suggestion with regard to commercial media had no bearing on the standards of excellence which have been and are still being achieved in some laboratories. The need is to raise the general standard throughout the country.

London, E.1.

A. J. KING.
E. GALLAGHER.

⁂ Professor McLeod's method of culture involves incubation of the organisms in air containing 8% carbon *dioxide*, not carbon monoxide as printed last week.—ED. L.

RELEASE OF SPECIALISTS

SIR,—On p. 30 of your last issue you report that the Minister of Health expressed himself satisfied that the Central Medical War Committee are making every effort to find replacements for specialist medical officers at present serving in H.M. Forces. Lest any of your civilian readers should think that serving specialists are suffering from delusions of persecution it may be well to state the demobilisation position as it will be at the end of September. Medical specialists in the Army will then be five groups behind officers and other ranks of other arms of their Service, seven groups behind medical officers of the R.A.F., fifteen groups behind general-duty officers of the R.A.M.C., and twenty groups behind medical officers of the Navy.

A few months ago the Central Medical War Committee announced that they had powers to call up specialists in civil life up to the age of 45. How many of these have been called up? Every three months the committee announce the demobilisation programme for the coming quarter. It is remarkable that they, who have been in charge of medical manpower for nearly seven years, are unable to forecast more than three or four groups ahead at any one time. Such unaccountable secrecy prevents those of us in groups not yet even mentioned from applying for civil appointments, since we can give no definite date by which we can expect to be demobilised.

As far as class B releases are concerned, it seems that for a specialist to be demobilised in this way a substitute has to be provided. I have studied Release Regulations for the Army, and can find no mention of this rule, so I assume that this is another example of the extraordinary tyranny under which we labour at the hands of this remote and reticent committee.

An open balance-sheet of specialists awaiting demobilisation and those eligible to be called up (I do not refer to those whom the teaching hospitals, the E.M.S., and the Medical Research Council consider "essential") would do far more to allay the resentment and dissatisfaction felt by serving specialists than any number of fatuous voluntary schemes which are produced for the derision of our more canny and essential professional brethren in civil life. Why cannot the Central Medical War Committee now use the totalitarian powers which they exercised so freely and remorselessly during the war?

The Minister of Health is to be congratulated on his satisfaction with the position. As a prominent member of a party on whose hustings last July could be seen the slogan "Vote Labour and get the Boys Home," he evidently possesses either an elastic conscience or a remarkably euphoric outlook. SERVING SPECIALIST.

PROPHYLACTIC PENICILLIN IN SURGERY

SIR,—I was glad to see Mr. R. Wood Power's letter in your last issue, because there seems to be little published work on this very beneficial practice which I believe to be widely employed.

I would like to add to his list of operations for which prophylactic penicillin might be of value that of tonsillectomy by dissection. Everybody who carries out this operation in a large series of cases must have met the occasional cases of pyrexia, scarlatiniform rashes, and, most tragic of all, nephritis following the operation. I regard such consequences of a non-urgent operation on a comparatively healthy child as a major disaster. In an endeavour to avoid them, Mr. J. B. Cavenagh, at my suggestion, recently introduced a routine at this hospital by which every patient is given 15,000 units of penicillin just before the induction of anæsthesia, and a further 15,000 units three and six hours afterwards. Personally I regard it as unnecessary to give a twenty-four hours' course before operation, since high blood-levels are invariably obtained within a few minutes of intramuscular injection.

Although our series is as yet too small to be scientifically significant, none of the complications named has occurred, nor has there been a case of secondary hæmorrhage since this routine was introduced. If it has prevented the development of nephritis in even a single child it is in my opinion amply worth the trouble and expense.

Royal Infirmary, Worcester. G. J. FRAENKEL.

Medicine and the Law

Alleged Cruelty to Cats

Prof. E. G. T. Liddell, Waynflete professor of physiology in the University of Oxford, was fined £25 last month by the Oxford magistrates on a charge of causing unnecessary suffering to cats in the animal-house of his department. Notice of appeal having been given, comment on the case must be deferred. The following brief summary of the proceedings is taken from the full report published in the *Oxford Times* of June 28.

Counsel, prosecuting on behalf of the Royal Society for the Prevention of Cruelty to Animals, alleged that, in a compound about 15 ft. by 10 ft., there were 34 cats "in every stage of misery and disease." Some were apparently dying; one was dead. The place smelt abominably. There was a pan of water, but no sleeping accommodation for the animals. Some were suffering from advanced stages of feline distemper; some were practically blind; others could scarcely breathe. Professor Liddell, said counsel, must have wilfully abstained from going to the place. The same was true of Mrs. Scragg, the woman who had charge of the cats. "If this case is proved, it has discovered a university plague-spot which calls aloud for immediate and drastic reform." Two inspectors of the R.S.P.C.A. gave evidence. One of them said he destroyed four cats in the defendant's presence and with his agreement. A veterinary surgeon (who, it appeared, has been appointed chief veterinary officer to the society) said he would not keep more than six cats in a space of 100 square feet, for fear of an epidemic; it was wrong to keep these cats as they were kept; each should have had individual treatment for distemper.

Professor Liddell, giving evidence, explained that he had been experimenting with the treatment of animals with sulphamethazine. It was found that by its use the secondary infection, but not the basic virus of distemper could be overcome. He himself had given the drug three times a day and had fed cats which could not feed themselves. Four days before the inspector's visit he decided to suspend the treatment to see what would happen. Distemper in cats was like measles in children; "once they have had it, they probably won't have it again." The witness described how he dealt with the cats. He was asked in cross-examination where he got the cats. "Somebody's pets, I suppose," commented counsel; "so far as you know, they may have been stolen?" The witness said the cats were not deliberately infected. The drug was being administered to check the distemper. The experiment had a negative result. The infected cats were not capable of feeling suffering because of lethargy of the nervous system. The experiment was not calculated to give pain. Prof. Harold Burrow, M.R.C.V.S., said there was ample room in the compound for 34 cats; the floor was suitable. Quick emaciation was a feature of feline distemper. Dr. A. D. Gardner, professor of bacteriology at the university, said that pain would decrease as coma and lethargy came on; he had heard nothing that made him feel that these animals suffered appreciably more than the suffering of all living things.

The magistrates found the charges proved. Professor Liddell, in addition to being fined £25, was ordered to pay ten guineas costs to the prosecution. Mrs. Scragg was fined £5.

On Active Service

CASUALTIES

ACCIDENTALLY KILLED

Flight-Lieutenant IAN ARCHIBALD McLEAN THOMSON, L.R.C.P.E., R.A.F.V.R.

Flight-Lieutenant Thomson, who was killed in a flying accident on June 25, was born in 1916 and studied medicine at Glasgow, where he obtained the triple qualification in 1942. After holding house-appointments at the Royal Infirmary, Glasgow, from March, 1942, to December, 1943, he was granted a commission in the Royal Air Force Volunteer Reserve. At the time of his death he was medical officer at a Communication Wing headquarters in Germany.

AWARDS

D.S.O.

Temporary Surgeon Lieut.-Commander R. G. S. WHITFIELD, M.R.C.S., R.N.V.R.

Parliament

ON THE FLOOR OF THE HOUSE

THE National Health Service Bill has completed its committee stage, and the verdict of members is that it was a very good-tempered committee. The report stage and third reading will follow this month; the Bill will then be sent to the Lords; and the final form will be passed when Parliament reassembles after the recess. Members of all parties, with some Conservative reservations, are satisfied that a good job has been done, and the only complaint was of the strenuous nature of the committee stage. But this hard going was implicit in the situation and was accepted with as much philosophy as possible.

The high-light in the House last week was the debate on the rationing of bread. Mr. Strachey's presentation of the facts convinced most of his hearers that however inconvenient rationing of bread may be—and its inconvenience has been perhaps magnified—we must accept it as a necessary insurance measure in a difficult world food situation. There was a good deal of heat in the debate but also much light, and this revealed a scarcity in the bread larder which must give pause to anyone who advocates non-rationing. There is enough, but there is no margin with which risks can be taken. Even in these days of good weather-forecasting we cannot be certain months ahead.

The fixing of the time of the Peace Conference for the end of this month, and the settlement of the vexed question of the status of Trieste, bring a great release of strain. With international problems on the way to solution every nation in Europe and the world can turn with more confidence to the problem of peace within its own borders.

In a session less crowded with legislation, and in a world less disturbed by the after-tremors of war, the New Towns Bill, which has advanced a further stage in the Commons, would have attracted more attention. As it is, legislation which sets out to re-create a large part of the urban life of this country is almost regarded as non-contentious. At least it excites few angry passions. And yet the planning of new towns will change the face of England, and make it a healthier-looking face.

Another cause for satisfaction in the international field is the return from India of the mission of three Cabinet Ministers who have set that subcontinent on its new road to freedom. India now has the opportunity for which her leaders have been asking for many years; though what she will make of it remains to be seen. To those who look forward not only to peace in Europe but also to a new era of peace in the East it seems that the first session of the present administration will end in happier circumstances than for many a long year.

MEDICUS, M.P.

THE HEALTH BILL IN COMMITTEE

PROPOSED NEW CLAUSES

WHEN the committee resumed its discussion of the National Health Service Bill on the afternoon of July 2, a clause by Mr. SOMERVILLE HASTINGS was given a first reading; by it, in the county of London, special representation was to be accorded to the local health authority on the regional hospital board, the hospital management committees, the executive council, and the boards of governors of the teaching hospitals. Mr. C. W. KEY said that there was no reason to vary the constitution of these bodies for London; local authorities would be consulted in deciding the composition of these bodies. The motion that the clause should be read a second time was negatived.

CONTROL OF MEDICINES

Mr. H. N. LINSTEAD presented a new clause calling on the Minister to appoint a committee which should form a list of medicines that were not recommended. The patent-medicine industry, he said, made the public conscious of ill health and caused them to regard the taking of medicine as necessary to good health. In many it certainly created fear and sometimes it caused postponement of seeking skilled medical advice. The claims made for some preparations were frankly deceitful, and there was some gross overcharging. Mr. A. BEVAN said that, though sympathetic with the purpose of the clause, he could not allow such a wide subject to be tucked in at the end of a committee stage. He recognised, however, that it was long past the time for the protection of the public against the ramp that was at present going on. The motion was withdrawn.

CENTRAL COUNCIL AND ADVISORY COMMITTEES

In the discussion of the first schedule, Mr. H. WILLINK said that a medical hegemony was not wanted in the National Health Service; in the Central Health Services Council, the five persons with experience of hospital management and the five persons with experience of local government should be the lay elements. He moved that they should not be medical practitioners. Mr. BEVAN agreed, and the amendment was carried.

Mr. BEVAN moved an amendment to allow of payment in respect of loss of remunerative time incurred through service by members of the council and standing advisory committees. The amendment was agreed to, and the schedule was passed. The adoption of the second schedule (acquisition of hospital property other than land) was also agreed to.

BOARDS AND COMMITTEES

In the third schedule, Mr. WILLINK moved that, apart from Ministerial appointments, members of regional hospital boards should be nominated by local authorities from the four categories already to be included. The aim, he said, was flexibility and balance, but there was too much flexibility in the schedule as it now stood. Mr. BEVAN agreed that the regional hospital boards were exceedingly important. They must be flexible because the needs of the regions varied, as did the richness of the human material. There must be modification after experience of the boards, and there should undoubtedly be strong lay representation: "Doctors . . . individually, are the most charming and educated persons, but, because of their immersion in their profession, their collectivity is not the sum of their individual intelligence." Mr. Willink's amendment was withdrawn.

A motion by Mr. WILLINK that a hospital management committee should have power to coöpt not more than three persons was negatived, and the committee adjourned.

When it reassembled on July 3, Colonel M. STODDART-SCOTT moved an amendment to the proposed constitution of the boards of governors of teaching hospitals. Members should, he suggested, be nominated in a certain proportion; he proposed that a sixth should be nominated from the universities, a sixth by the regional hospital boards, a sixth by the medical, dental, and other members of the teaching staff, and a sixth after consultation with the local health authorities, and that the other persons should be appointed from the members of the governing body of the hospital. The boards should have power to coöpt not more than three persons, and should have the opportunity of electing their own chairman. Mr. WILLINK said that the change of the proportion from a fifth to a sixth was suggested to allow a small quota from the local health authorities. Continuity would be ensured if, after the nomination of two-thirds of the members by the Minister, the remaining third were chosen from the existing board of governors.

Mr. SOMERVILLE HASTINGS opposed appointments to the new boards from the ranks of those now in being: the present tradition as to the appointment of governors was not entirely satisfactory. Lord WILLOUGHBY DE ERESBY called for better university representation on the boards.

Mr. BEVAN said that overemphasis on the academic aspect must be resisted. The teaching hospitals were part of the general-hospital service and were expected to give general-hospital facilities. There had been a disposition by the teaching hospitals to leave to the municipal hospitals the cases that were not interesting; that was why the teaching-hospital service must, in its administration, be as much an agent of the Minister as the regional board. Continuity of administration was desired, and would be considered, but the importunities of the teaching hospitals must be resisted. At the moment the universities had scarcely any representation, and this Bill for the first time formalised and regularised the relationship between academic medicine and hospital administration, as had been recommended by the Goodenough Committee. Colonel Stoddart-Scott's amendment was negatived. The schedule, with amendments, was agreed to.

LOCAL HEALTH AUTHORITIES

Mr. **Willink** moved an amendment that every health committee of a local health authority should include one or more medical practitioners. It was not right, he suggested, to run the risk that the only medical man attending the health committee might be the medical officer of health or one of his assistants. Sir **Harold Webbe** supported this proposal for coöption, as a means of closing the fissure between the hospital service and the public-health service. Mr. **Bevan** resisted the proposal; the scheme already devised provided, he said, for a very great degree of professional self-government and professional participation in the health services as a whole. The amendment was negatived and the schedule, with some amendments, was agreed to.

EXECUTIVE COUNCILS

In the discussion of the fifth schedule, Dr. **Richard Clitherow** suggested that the local executive council should include a representative from the optical practitioners' committee and better representation from the pharmaceutical committee. Mr. **Bevan** pointed out that the ophthalmic service was to be a feature of the regional boards and not of the executive council. The council would call into existence the ophthalmic services' committee, but the supplementary service would not be exercised through the executive committee. In reply to Mr. Linstead, Mr. Bevan said that in the council, which consisted of representatives of highly organised elements in the community, there would at first be a tug-of-war for supremacy. An important appointment like the chairman of the council ought, in the first instance, to rest with the Minister. After homogeneity had been attained, it would be easier for the Minister to accept nominations. What was wanted on the executive council was not representation of interests but a pool of technical knowledge. The schedule, with minor amendments, was agreed to, as were the remaining schedules, and the committee rose.

The committee stage has now been completed, and the amended Bill is to be reported.

FROM THE PRESS GALLERY

Pay of Medical Officers in Services

New rates of pay for members of the medical, dental, and veterinary professions serving in the Armed Forces were announced by Mr. J. J. **Lawson**, Secretary of State for War, in the House of Commons on July 5. From July 1, 1946, there will be a common scale of pay and time promotion in the medical and dental branches of all three Services. Officers will be appointed in the rank of acting surgeon lieutenant R.N., lieutenant, or flying officer, and promotion will be by time to surgeon lieutenant R.N., captain, or flight lieutenant after one year, and to surgeon lieutenant-commander, major, or squadron-leader after eight years. Thereafter promotion will be by election. Medical officers will be paid as shown in the accompanying table.

CONDITIONS OF SERVICE

It is intended to continue the arrangement under which a medical or dental officer who is commissioned after holding an approved whole-time appointment in a recognised civilian hospital may be granted an antedate of seniority. In future, however, there will be a common rule for all three Services, and the antedate, which will count towards the service qualifying for increments of pay and for promotion to the rank of major or equivalent in the other Services, will take effect on completion of 12 months' service.

PAY OF MEDICAL OFFICERS IN SERVICES

Approx. age	Service	Rank	Pay (daily)
			s. d.
25	On appointment	Acting surgeon lieutenant R.N., lieutenant, or flying officer	22 0
26	After 1 year	Surgeon lieutenant R.N., captain, or flight lieutenant	28 0
28	,, 3 years	ditto	31 0
30	,, 5 ,,	ditto	34 0
32	,, 7 ,,	ditto	37 0
33	,, 8 ,,	Surgeon, lieutenant-commander, major, or squadron-leader	43 0
35	,, 10 ,,	ditto	46 0
37	,, 12 ,,	ditto	49 0
39	,, 14 ,,	ditto	52 0
	On appointment	Surgeon commander, lieutenant-colonel, or wing-commander	58 0
	After 2 years	ditto	61 0
	,, 4 ,,	ditto	64 0
	,, 6 ,,	ditto	67 0
	,, 8 ,,	ditto	70 0
	On appointment	Surgeon captain R.N., colonel, or group-captain	75 0
	After 2 years	ditto	78 0
	,, 4 ,,	ditto	81 0
	,, 6 ,,	ditto	84 0
		Surgeon captain R.N. (after 8 years as such), brigadier, or air commodore	87 0
		Surgeon rear-admiral, major-general, or air vice-marshal	110 0
		Surgeon vice-admiral, lieutenant-general, or air marshal	135 0

The arrangements for the encouragement and reward of specialisation are still under consideration.

SERVICE RETIRED PAY AND GRATUITIES

The new general scheme of service retired pay and gratuities for Regular officers, details of which are given in appendix 3 of the white-paper, Command 6750, will also apply to permanent Regular medical, dental, and veterinary officers who were serving on the active list on Dec. 19, 1945, or who are commissioned after that date. There will be some adjustment on the lines of existing arrangements, for Naval medical officers who retire with less than 25 years' service after having received the special gratuity of £1000 which was payable under the old code.

Medical, dental, and veterinary officers who are now serving with permanent Regular commissions will, like other officers, remain eligible, if to their advantage, for awards under the regulations now superseded, instead of the new terms. (See paragraph 67 of Command 6750.)

Officers who retired with retired pay before Dec. 19, 1945, and who served during the war, will be allowed reassessment of their retired pay in respect of their war service under the terms of the scheme announced in the House of Commons on April 15.

Bread Rationing

In the House of Commons on July 3 Mr. **John Strachey**, Minister of Food, opened a debate on the Government's decision to introduce bread rationing. He explained that there was no stock of wheat whatever in the sense of there being some great reserve lying idle somewhere in the country. There was only the wheat which was going through what the Americans called the pipe-line from the ship as it arrived in port to the counter of the baker's shop. At the end of August there would be about 800,000 tons—that is, about eight weeks' supply—of wheat or flour in the country, but it would be a delusion to suppose that the country's grain supply would continue for eight weeks at that level without new supplies coming in. A breakdown would occur very much before eight weeks; exactly when was a matter of opinion. Stocks never had reached that breaking point, and none of the experts of the Ministry of Food was prepared to say that it would occur when the stock was at any particular figure; but somewhere not far below the 800,000 tons figure a point would be reached where the distribution system, first of wheat and then of flour after it had been milled, would finally break down. The exact level of safety to which the pipe-line should be allowed to drop without bread rationing was somewhat academic, but Mr. Strachey said that the greatest experts of his department believed it would be reckless to let it drop below a minimum of 750,000 tons of wheat and 300,000 tons of flour. The experts might have been overcautious, but it would be a great responsibility to overrule their opinion.

The estimate that our stock of wheat would be 500,000 tons, and of flour 300,000 tons, at the end of August next was based on three assumptions. The first was that the United States would in fact deliver to us the whole of the 456,000 tons of wheat which repaid the loan of 200,000 tons and made good the inability of Canada to supply us with the usual quantities of wheat during the next two months. He had no doubt about the United States administration's intentions to do that; but their ability to do it was bound up with economic and industrial conditions which might cause delays. To postpone any decision on bread rationing here would be to gamble on American labour relations and on the course of affairs in Congress during the next few weeks. The second assumption was that we should receive from our own harvest during August 75,000 tons and during September 250,000 tons. While the harvest prospects were good it would be rash to gamble on the vagaries of our climate during the next two months. The third assumption was the size of the Canadian crop, which would be the dominant factor in our prospects of wheat supplies in the autumn, and also beyond the August point he had mentioned. Although the Canadian crop promised very much better than it did a few weeks ago, it had by no means passed the danger point yet, and once again we could not afford to gamble on the weather on the Canadian prairies.

If all these assumptions, and some others, turned out to be justified, and if things proved to be even better than the estimates he had given, we might scrape through without bread rationing. But, what a wholly unjustifiable risk that would be to take with the food of the people! The Government refused to take such a risk. Moreover, if wheat and flour were not rationed a good deal of our supplies would find its way in the autumn to animal rather than to human consumption. It was not the policy of the Government to increase the slaughter of herds in this country; the figures on which the increase in the meat ration had been made were based entirely on our present stock of meat and were due to more favourable imports of meat from abroad.

HELP FOR OTHER COUNTRIES

Dealing with what this country had done to help the semi-starving countries of the world, and the reason why the British Government believed that Britain had now come to the end of its ability to help any more in that direction out of its own meagre resources, Mr. Strachey said that since November, 1945, we had sent or diverted 60,000 tons of cereals, mostly wheat, to India; 60,000 tons through UNRRA to Italy, Poland, Greece, and Yugoslavia; 60,000 tons to Germany; 10,000 tons to South Africa; and 10,000 tons to Belgium. All this tonnage was lent, and would be replaced by the United States government. In addition, we had sent to the British zone in Germany since the same date 192,000 tons of wheat, 109,000 tons of flour, 105,000 tons of barley, and 132,400 tons of potatoes. The sending of these supplies to India and to Western Europe had undoubtedly been a factor in the present decision to ration our own bread. But he believed that the Government had been fully justified in sending this relief and he was proud to be a citizen of a country which had made such a contribution. (Cheers.) As to nutrition in the countries to which the relief supplies had been sent, Mr. Strachey admitted frankly that he was far more concerned with the standard of nutrition in India, France, Holland, Greece, Yugoslavia, and many other Allied countries, than with the feeding of Germans. But the British zone in Germany contained the Ruhr, the industrial and raw-material heart of Europe, and on the Ruhr, whether we liked it or not, depended the recovery of all Western Europe.

It might be said that all the stories about malnutrition, or even semi-starvation, in the British zone in Germany were nonsense and that the Germans were managing to pull food out of their cupboards and were perfectly well off. But the Ministry of Food could not rely on travellers' tales. Mr. Strachey quoted extensively from the report of the tripartite committee on their investigation of conditions in Germany (summarised in THE LANCET of July 6, p. 22). The best the Government could try to do was to maintain the conditions described in the report—that is, to maintain the 1000-calorie ration which produced the serious malnutrition described in the report. Merely to maintain that inadequate calorie level, in addition to the utmost that we could do by way of procuring grain for the western zone from Argentina, or anywhere else, the United States would have to ship at least 120,000 tons of wheat to the British zone in each of the next three months. During his (Mr. Strachey's) own visit to America in the previous week he found that the U.S. authorities were much less definite about shipping that amount to the British zone than they were about sending 450,000 tons to us during the same period. That was gratifying and flattering to us, but if the United States failed to ship that 120,000 tons to Germany there would be a fatal breakdown in the present 1000-calorie ration, with incalculable social and political consequences, apart from human consequences, throughout Western Europe. He had every hope that the United States government, when they were fully seized of the whole situation, would supply that 120,000 tons a month during the next three months to the British zone in Germany. If they were unwilling or unable to do so, the British Government could not, after having rationed the bread of the British people, divert further stocks from this country to supplement the ration in the Western zone of Germany.

Mr. Strachey asked the United States government to consider in time whether it was not a paramount interest of theirs as of ours that at any rate the 1000-calorie ration scale should be maintained.

OTHER VIEWS

Mr. R. S. HUDSON, the principal speaker for the Conservative Opposition, described Mr. Strachey's speech as a sombre one. It was quite clear from the figures given that the real reason why Mr. Strachey had introduced bread rationing was that he was afraid that if any one of the numerous assumptions he had mentioned to the House did not come off he would be compelled, at some time at the end of August or the beginning of September, to put the screw on and cut these rations still further. It was expecting a great deal, in view of our recent experiences in the United States, to hope that they would succeed over three months in maintaining unbroken a supply at that rate, and for that reason he quite understood why Mr. Strachey had taken his decision. But, as introduced, the rationing scheme would not save an appreciable quantity of wheat. It was arguable whether more wheat had not already been wasted than would be saved during the first three months of rationing. The Opposition still believed that with reasonable foresight the necessity for bread rationing could have been avoided. It was likely, he thought, to break down in operation. But the Government had decided on its introduction, and the result would be that, if any of these assumptions did not come off, with the exception of Germany and Austria we should probably be about the worst-fed white nation in the world.

(The last sentence of Mr. Hudson's speech was characterised as "utter nonsense" by Mr. Strachey and there ensued a noisy and angry scene during which the supporters of the Government repeatedly called on Mr. Hudson to withdraw the statement, which, however, he refused at this stage to do.)

Mr. CLEMENT DAVIES, from the Liberal benches, said that in the position which had now been disclosed by the Minister of Food, bread rationing was inescapable. The fact that Mr. Strachey had made this very serious statement had shown the necessity for the public being taken into the confidence of the Government long ago. No Government had the right to come to a decision in private which affected the well-being of the people of this country without disclosing all the facts and figures which had influenced their decision. (Cheers.)

Mrs. BARBARA CASTLE said it would appear that Mr. Hudson had not read the Government's white-paper on the world food shortage published last April. This document showed that the population of the United Kingdom as a whole was then enjoying a diet of 2850 calories per head per day, or 93–95% of our pre-war diet. She understood that bread rationing would reduce that diet by no more than 50 calories per day, where any reduction did take place. That compared with a diet in France, Belgium, Holland, and Norway of 2300–2500 calories per head per day, which was 75–80% of the pre-war level. UNRRA countries—Greece, Yugoslavia, Czechoslovakia, and Italy—dropped spectacularly to below 2000 calories, or 70–75% of the pre-war level. As for ex-enemy countries, they were now down to 1000 calories a day, eking out an existence at about a third of their pre-war consumption. If this country was to get through the next few difficult months now was the time to encourage our people to "hold on." Deliberately to spread alarm and despondency on the basis of rumours and claims that could not be substantiated was nothing less than an act of treachery by a political party which for years had prated of patriotism.

Sir ARTHUR SALTER said that the Government had now given to the House a great deal of the information for which they had been pressed for some time. What a tragedy it was that that information had not been given earlier. By withholding it they had lost the immense benefit to this country and the world which would have resulted if the true situation had been realised, so that the action which was now being taken tardily and with great difficulty might have been taken many months earlier and we might have had the benefit of the consequent saving throughout all these critical months. Part of the Government's case was not only strong but unanswerable. He dissented from any suggestion that the contributions that had been made to aid distress and famine areas in Europe and elsewhere were excessive—quite the contrary; what had been contributed was lamentably below the real needs of the situation.

The case for the Opposition was finally summed up by Mr. EDEN, who said that the situation revealed by Mr. Strachey was much more serious than anything that he had anticipated, and he gave the Government the full benefit of that. But it was a great misfortune that the situation was not made plain to the public long since. Who could doubt that, if American opinion had known to what straits this country was being reduced and how narrow was our margin, it would have been influenced by that knowledge? (Opposition cheers.) As regards the food position in the British zone in Germany, it had to be borne in mind that though the present position seemed pretty bad this country had had six years of pretty hard rationing, and certainly a large section of the German people had lived pretty well on the supplies from occupied countries throughout the war. It was clear from what the Minister had told the House that some restriction of consumption was necessary, but the House had not been told how the rationing scheme was going to work. When the scheme was prepared and laid before the House there would be an opportunity to pray against it and the Opposition would decide whether they would vote against the order or not. In the meantime the Opposition could not tell the Government that they approved of the methods of administration which had brought matters to this pass. There had been order, counter-order, and disorder in the administration of these food problems. The major error had been not to inform the House of Commons, the country, and the world about the facts. (Opposition cheers.) If the Opposition had not asked for this debate the House would still be in ignorance of the facts. Therefore the Opposition would be obliged to challenge a division on the Ministry of Food vote.

Mr. STRACHEY, closing the debate for the Government, reverted to Mr. Hudson's remark at the end of his speech and quoted again the figures from the white-paper on the world shortage in refutation of the right hon. gentleman's allegation. To show the extent to which Mr. Hudson was exaggerating, to use no stronger term, it would be necessary, said Mr. Strachey, for the entire bread and cereals ration of this country to be done away with altogether. and there would have to be no bread at all available to the people of this country, to bring us down to the lowest levels of the worst-fed countries in Europe today.

Mr. HUDSON said there had been a genuine misunderstanding which it was important to clear up. If Mr. Strachey assured the House and the country that there were sufficient stocks, and would be sufficient stocks, to avoid any reduction in the rate of the ration which he proposed to bring in on July 21, then quite clearly he (Mr. Hudson) was under a complete misapprehension and he withdrew his remarks.

Mr. STRACHEY: In that period, yes. If this harvest and the next harvest failed all over the world, we did not know. That disposed of the matter. Mr. Hudson would be the last man to wish a statement like that to go out to the world when he must realise that it could be used in the most damaging way not to this Government but to this country. (Cheers.)

Continuing, Mr. Strachey announced that the Ministry of Food had purchased and had in their possession in Argentina and in Brazil over 300,000 tons of coarse grains. As to the rationing scheme itself, any such scheme was irksome to administer, but an attempt would be made to make it as little irksome as possible. He proposed to make three changes in the Meals in Establishments Order. It was at present perfectly possible while serving only three courses to charge any amount of money for them if they were served in a private room. So he proposed to make a charge of 2*s*. 6*d*. per head maximum for the use of a private room. Secondly, if *bread was to be rationed it became a scandal that bread* could be taken in restaurants quite easily. He therefore proposed that in all catering establishments the bread should be made one of the three courses allowed. During this season when herrings were plentiful he was exempting herrings from being a main course. In conclusion, Mr. Strachey agreed in general with the main line of argument of Sir Arthur Salter. He believed that the very maximum of precise information on the situation should be given and on the situation in Western Germany. It was most important that they should keep that before the mind and conscience of the world and he would endeavour to do that in the most effective possible way.

Mr. EDEN moved to reduce the Ministry of Food vote by £5, and on a division the motion was negatived by 433 votes to 178.

Food in the British Zone

A question by Mr. V. J. COLLINS on the situation in Germany drew a statement from Mr. J. HYND, chancellor of the Duchy of Lancaster, the Minister responsible for the British zone. It has for some time been impossible, he said, to maintain stocks of bread grains in the British zone which would ensure regular distribution and prevent local breakdowns in supply. At present no more than four or five days' supplies are in hand on any given date. Distribution of ration foodstuffs to the normal consumer is on the basis of 1050 calories daily, which is less than half the amount adjudged to be necessary for maintaining normal resistance to disease.

Naturally, said Mr. Hynd, food-production had been encouraged in every possible way, and in order to see that farmers deliver their produce in accordance with regulations, inspection committees have made three inspections of farms. The first, made before the main harvests were brought in last year, was to assess the amount likely to be obtained; each farmer was given a quota which he had to deliver. The second inspection was made after deliveries commenced, to ascertain whether any deliveries had been below estimates. The third inspection was made recently for the purpose of "scraping the bin." Each inspecting committee was accompanied by a German trade-union representative, and at the threshing period an inspector stood by each threshing machine to check the grain passing through. The final inspection brought only 15,000 tons in all, and it must be assumed that we have now virtually exhausted this source of supply. All the evidence indicates a high degree of coöperation on the part of the farmers, and a satisfactory absence of sabotage or falsification of stocks.

A tripartite nutritional investigation has been undertaken in the three western zones.[1] The findings show that the effects of the ration cuts last March are now becoming apparent, and that the population is in fact seriously underfed. While it is inevitable that in such conditions there should be instances of illegal transactions in food, there is no black market in the sense that substantial illicit meals are available in hotels and restaurants. Any illegal transactions in food that can take place are not on a scale to affect the general level of consumption. The assistance of three or four German democratic parties in the zone, and of the churches as well, has been secured in a common appeal to people in all districts for a voluntary surrender of any small amounts of food they may have in the cupboards to assist the very difficult situation arising in the big towns.

---

[1] See *Lancet*, July 6, p. 22.

Mr. R. S. HUDSON: In view of the very critical cereal stock position which the Minister has just disclosed, may I ask what has happened to the arrangements that were made by the Lord President of the Council (Mr. Herbert Morrison) on his recent visit to America by which we understood the Americans were to ensure that adequate supplies of bread grains were available in the United States and British zones?

Mr. HYND: The arrangement that was reached with the Americans by the Lord President of the Council provided for sufficient bread grains to come forward until the end of September to maintain the present calorie ration of 1050, which is of course not adequate but which was the position provided for. The very serious stock position, to which I referred, is an interim position pending the arrival of the bulk of those stocks. Already more than 100,000 tons have arrived, but as we had already run down almost completely the pipe-line which existed when that agreement was reached there is no pipe-line available from these arrivals, which are being used to meet current consumption and distribution. We have, in fact, only been able to keep the position fluid, pending further arrivals, by the fact that we are in a position now to take certain measures which could not be taken in normal conditions—namely, the requisitioning of transport and the collection of small stocks from one part or another as a kind of war operation. It has been an emergency operation and we have been able to save the situation until now, but it is evident that until the bulk of the American shipments arrive we shall be in a very difficult position.

QUESTION TIME

National Health Service and Choice of Doctor

Mr. JOHN MCKAY asked the Minister of Health if he would give an assurance that under the National Health Service Bill patients would have a free choice of doctors and not be restricted to the doctors covering the district in which the patients lived and who had made a contract of service under the National Health Service Act.—Mr. A. BEVAN replied: Yes, Sir. It is intended to give patients the widest possible choice among practitioners taking part in the new health services, but the details of the way in which this can be arranged must be a matter for regulations.

Medical Treatment in Mining Industry

Mr. WILLIAM FOSTER asked the Minister of Fuel and Power if he would make a statement of the progress made in the establishment of a medical service scheme at the collieries in the mining industry; the number agreed upon and the number actually commenced.—Mr. H. GAITSKELL replied: Arrangements for the erection of 5 experimental types of medical treatment centres are completed, and it is hoped that all will be built and in operation by the end of the year. The construction of permanent centres, following experience with the experimental types, will naturally take much longer; and meanwhile suitable first-aid or other accommodation is being adapted at selected collieries for use as centres. The immediate aim is to have about 50 adapted centres in operation as soon as possible.

Holiday Milk for School-children

Mr. V. J. COLLINS asked the Minister of Food whether arrangements could be made for school-children to be granted an allocation of milk at their homes during the summer holidays equivalent to the allowance which they now received at school.—Mr. J. STRACHEY replied: I would very much like to have made this arrangement, but my department has spent a considerable time trying to devise a workable scheme, and I am reluctantly driven to the conclusion that it cannot be done. Arrangements do exist to enable school-children to have their school milk during the holidays when they can collect it at central schools or other suitable places, but little advantage has so far been taken of this.

Obituary

GEORGE JESSEL

M.A., D.M. OXFD, D.P.H.

Dr. George Jessel, a consultant tuberculosis officer of the Lancashire County Council, died suddenly on June 23 at the age of 63. He was well known and distinguished for his work in tuberculosis.

Educated at University College, Oxford, where he was a mathematical scholar, he graduated in medicine in 1909 from the London Hospital, where he won the Price scholarship and the Anderson prize in clinical medicine. After working at the Hospital for Sick Children, Great Ormond Street, he spent two years in private practice. He took the D.P.H. at Manchester University in 1913, being first man of the year, and his D.M. at Oxford in 1917.

Ernest Cave

Dr. Jessel started his work in tuberculosis in 1913, when he was appointed tuberculosis officer for the combined county district and county borough of Wigan. He was also acting M.O.H. of Wigan from 1914 to 1917. In 1919 his joint appointment with Wigan ceased and he became a full-time consultant tuberculosis officer of the Lancashire County Council. For 33 years he was in charge of dispensary area 4—containing a population of about 370,000, with dispensaries at Eccles, Leigh, Farnworth, Stretford, and Pendlebury—which included the Peel Hall Pulmonary Hospital, of which he was the visiting medical superintendent. There his work was of a particularly high order, and it would be difficult to imagine a more efficiently managed institution. He introduced a system of graduated work and exercise for the patients with the dual object of varying the monotony of sanatorium life and of benefiting the patients both physically and mentally. In his own words: "The tuberculosis officer who aims at realising the ideals of his office must undertake somewhat the rôle of schoolmaster and cleric as well as medical specialist." And no mean part of his reward lay in the volume of appreciation of the patients. He was a strong advocate of treating the family of the tuberculous patient as the unit.

For many years Dr. Jessel was connected with the north-western branch of the Society of Medical Officers of Health and the N.W. Tuberculosis Society, and he was a past-president of both these bodies. He took a great interest in the Joint Tuberculosis Council of England and Wales; for a long time he was the honorary treasurer and at the time of his death was a vice-chairman. He served on many committees of the council, where his wide knowledge of tuberculosis was of immense value in the production of reports and publications on various aspects of the subject.

His life was devoted to the study of tuberculosis and the many problems connected therewith. Tremendously keen on his work and full of energy, he never spared himself. As a consultant he will be sorely missed by the medical practitioners in his area.

Dr. Jessel leaves a widow, a son, and two daughters.

F. C. S. B.

EDGAR HENRY WILKINS

M.B. DUBL., D.P.H.

Dr. E. H. Wilkins, who died at Birmingham on June 13, after a short illness, was a valuable member of the school medical service. He was born in Dublin, where his father was headmaster of the High School, and his uncle, Prof. George Wilkins, was a leading personality at Trinity College. He himself graduated M.B. at Dublin in 1912. After qualifying, he spent ten years in New Zealand, where he worked with Sir Truby King, and became director of the school medical service at Wellington. On his return to England he was appointed to the school medical staff at Birmingham, where he served for the rest of his life.

"Wilkins was interested in all phases of public-health work," writes W. R. D., "but his chief enthusiasm was school medicine. He had all the keenness of the pioneer, without the fanaticism. All his contributions were characterised by a disciplined thoroughness, and he was invariably tolerant to divergences of opinion. At the time of his death he was engaged on a work in which he hoped to describe school medicine as he saw it. It is to be hoped that this work will be published; his many friends will be glad to possess it." To his school work, says J. R. M., he brought not only sound clinical knowledge, but that quality of deep personal interest in the patient which alone can bring medical work to its fullest fruition. "His daily work was in a crowded industrial area, where his influence was widely appreciated and where his loss is deeply felt by the parents of the children to whom he devoted his energies and talents, as also by the teachers of schools under his care. He was endowed with the restless, inquiring mind of the born research worker, and, no matter how busy he might be in his daily work, invariably had some subject of research in hand."

Dr. Wilkins was a keen athlete and a successful racing cyclist and for many years he climbed the mountains in Wicklow and in Wales. He was a close student of chamber music, annotating numerous scores, and an enthusiastic gardener and carpenter. He found the greatest pleasure in his home, where his wife and family shared all his interests.

Appointments

Clarke, L. P., M.R.C.S.: clinical pathologist, Rotherham.

Gartside, I. B., M.R.C.S.: specialist pathologist, Clayton Hospital, Wakefield.

Gilmour, A. A., M.D. Glasg.: asst. county M.O., Ipswich.

Rigby, J. P. V., B.M. Oxfd: asst. tuberculosis officer, Lewisham.

Tunstall-Behrens, Morwenna M., M.B. Camb.: casualty M.O., Hospital for Sick Children, Great Ormond Street, W.C.1.

Turner, J. W. Aldren, D.M. Oxfd, M.R.C.P.: neurologist, St. Bartholomew's Hospital, E.C.1.

Waterston, D. J., M.B.E., M.B. Edin.: resident surgical officer, Hospital for Sick Children, Great Ormond Street, W.C.1.

University College Hospital, W.C.1.—The following appointments are announced:—

- Bamber, G. W., M.D. Camb., F.R.C.P.: asst. physician to skin dept.
- Cope, R. W., M.R.C.S., D.A.: anæsthetist.
- Davies, D. R., M.B. Lond., F.R.C.S.: asst. surgeon.
- Ebsworth, J. D., M.R.C.S., D.A.: anæsthetist.
- Matthews, D. N., O.B.E., M.CHIR. Camb., F.R.C.S.: asst. surgeon.
- Schlesinger, Bernard, O.B.E., M.D. Camb., F.R.C.P.: asst. physician to children's diseases dept.

Royal Free Hospital, W.C.1.—The following appointments are announced:—

- Dollar, Jean M., M.S. Lond., F.R.C.S., D.O.M.S.: ophthalmic surgeon.
- Gardner, Frances, M.D. Lond., M.R.C.P.: asst. physician.
- Gray, Charles, M.B. Manc., F.R.C.S.: orthopædic surgeon.
- Hill, Gladys, M.D. Lond., F.R.C.S., F.R.C.O.G.: obstetrician and gynæcologist.
- Qvist, George, M.B. Lond., F.R.C.S.: asst. surgeon.

King Edward Memorial Hospital, Ealing.—The following appointments are announced:—

- Crosland, J. H., M.R.C.S.: M.O. in charge of physiotherapy dept.
- Murray, C. J. B., M.S. Lond., F.R.C.S.: second surgeon.
- Treissman, Herman, M.B. Lond., F.R.C.S., D.O.M.S.: ophthalmic surgeon.

Royal Hampshire County Hospital, Winchester.—The following appointments are announced:—

- Golden, G. N., M.B. Lond., F.R.C.S.: orthopædic and traumatic surgeon.
- Ingram, P. W., M.B. Aberd., F.R.C.S.E.: asst. surgeon.
- Midgley, Gordon, M.R.C.S., D.L.O.: asst. E.N.T. surgeon.
- Neustatter, W. L., M.D. Lond., M.R.C.P.: psychiatrist.
- Roberts, R. I., M.R.C.S., D.M.R.: M.O. in charge of X-ray dept.
- Rubin, Jack, M.B. Cape Town, F.R.C.S.E.: asst. surgeon.

Royal Hospital, Wolverhampton.—The following appointments are announced:—

- Benison, R. L., F.R.C.S.: surgeon.
- Brown, D. M., M.B. Birm.: anæsthetist.
- Campbell, G. W., L.R.C.P.E.: anæsthetist.
- Davies, J. V. S. A., M.R.C.P.: physician.
- Heath, Newton, F.R.C.S.E.: asst. orthopædic surgeon and fracture officer.
- Hutchinson, W. R. S., F.R.C.S.: surgeon.
- Jones, H. E., M.R.C.P.: pædiatrician.
- Oakley, D. E., M.B. Camb.: dermatologist.
- Rickards, J., M.R.C.S., D.A.: anæsthetist.

General Hospital, Nottingham.—The following appointments are announced:—

- Glass, E. J. G., M.B. Edin., F.R.C.S.E., D.L.O.: aural surgeon.
- Procter, J. D., M.D. Camb., M.R.C.P.: physician.
- Twort, R. J., M.D. Aberd., M.R.C.P.: asst. physician.
- Whimster, W. S., M.D. Lond., M.R.C.P.: physician.

Colonial Medical Service.—The following appointment has been announced:—

- Houston, Captain G. F., M.R.C.S.: M.O., Nigeria.

Notes and News

DIPLOMA IN INDUSTRIAL HEALTH

A few months ago a diploma in industrial health (D.I.H.) was instituted by the Society of Apothecaries.[1] The Conjoint Board of the Royal Colleges of Physicians and Surgeons have now issued regulations for a similar diploma. Courses of study and practical instruction followed by an examination in two parts have been prescribed, the scheme bearing some resemblance to the curriculum and examinations for the diploma in public health. Exemption from the first part of the examination is granted to holders of a certificate in public health.

To secure admission to part I of the examination candidates are required to produce a certificate of satisfactory and regular attendance on a course of study extending over 10 weeks whole-time or 5 months part-time, covering in either case not less than 300 hours. The course for part II is made up of 350 hours devoted to systematic and practical instruction, the latter to include attendance at a skin clinic, an ophthalmic clinic, and the accident department of a recognised hospital. Visits must be paid to industrial establishments, docks, shipyards, and mines, and 100 hours must be spent at works surgeries under the instruction and supervision of experienced industrial medical officers. Conditions of admission to the examination may be modified at the discretion of the committee of management in the case of a candidate who has held whole-time appointments as an industrial medical officer for not less than three years; or who holds a D.P.H.; or whose experience during not less than ten years appears to the committee to be adequate.

The subjects to be studied are given in detail and include, in part I, the functions of central and local authorities and voluntary organisations; social security, relief agencies, and international health organisations; statistics; the sources and control of infection; the influence of environment and heredity on health; physical education; and the principles of health education. For part II the structure of industry in all its aspects must be studied, in addition to legislation relating to industrial health and the organisation of health services in industry. Further subjects are applied physiology and psychology in industry, the placement of workers, industrial accidents, rehabilitation, and resettlement in industry. Attention must be given to special problems relating to the employment of women and young persons. And the candidate is also required to know something about occupational diseases and disabilities.

OPENING OF PRESTON HALL EXTENSION

The Orchard Pavilion, an extension of the British Legion village at Preston Hall, was opened by Mr. George Isaacs, Minister of Labour, on July 3. The extension will be used for the employment of ex-Service tuberculous patients in the toy-making industry. Mr. Isaacs said that it was now recognised that medical care, rehabilitation, and employment were all parts of an integrated process. Employers had coöperated in accepting the statutory 2% of disabled men, and the proportion would soon be raised to 4%. The Disabled Workers' Corporation had opened two factories, and had its eyes on some forty other places. It was hoped that the great industries would subcontract their work to the homes of disabled workmen. So far, more than 500,000 were registered under the Disabled Persons Act, and 23,000 of these were victims of pulmonary or surgical tuberculosis.

EPSOM COLLEGE

The 93rd annual report of the council of the Royal Medical Foundation of Epsom College tells of great difficulties. High costs last year left the school accounts with a loss of some £1175—an experience shared by most schools which, like Epsom College, refrained from raising their fees during the war. The health of the boys has been good apart from a series of epidemics in the Lent term of this year. Though there was a lower proportion of passes than usual in the first M.B. examination, results in the Higher Certificate examination were good, the number of distinctions being the biggest on record, and the high standard in gaining open scholarships at Oxford and Cambridge was fully maintained. Sports records have been creditable. The average number of boys in 1945 was 441, but numbers have continued to rise and this term there are 476. The council have at last found it necessary to raise fees, which are now as follows: doctors' sons, £170 yearly for boarders and £65 for day-boys; dentists' sons, £175 for boarders and £70 for day-boys; other boys, £180 for boarders and £75 for day-boys. The actual cost works out at £169 15s. yearly for a boarder and £65 for a day-boy. During the year bequests for special purposes amounted to £1733, and for general purposes to £998; the Medical Insurance Agency gave £352 to the Squire Sprigge scholarship fund, and £45 to the Purnell trust fund. Subscribers are reminded that they can nearly double their contributions without cost to themselves by entering into a covenant to pay a subscription for seven years.

---

[1] See *Lancet*, 1945, ii, 451, 499.

A LIST OF SPEECH THERAPISTS

The Board of Registration of Medical Auxiliaries has just published a register containing the names and addresses of qualified speech therapists, and doctors are urged in the covering letter to refer to this register when engaging a speech therapist either for hospital appointment or in private practice. The recognised qualifying body is the College of Speech Therapists, and all those on the register are either licentiates or fellows of the college. The 210 practising therapists are well distributed about the British Isles. Copies of the register will be supplied free to doctors, hospitals, and local authorities on application to the registrar of the Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

University of Oxford

The following degrees were conferred on June 27:

M.D.—Charles Hollins and C. A. Hinds-Howell.

B.M., B.Ch.—J. R. Nassim (in absence).

University of Cambridge

At congregations on June 25, the following degrees were conferred:

M.D.—Raymond Daley and A. E. de la Tour Mallett.

M.B., B.Chir.—G. S. Ostlere (by proxy).

Among appointments to take effect from Oct. 1 are those of Dr. R. I. N. Greaves as reader in bacteriology, Dr. R. Nigam as demonstrator in anatomy, Dr. K. C. Dixon as demonstrator in chemical pathology, and Dr. J. A. R. Miles and Dr. G. R. E. Naylor as demonstrators in pathology.

University of Birmingham

At a congregation on July 5, the following degrees were conferred:

M.D. (ex officio).—Prof. Solly Zuckerman, F.R.S.

M.D.—A. E. Chaplin, C. R. St. Johnston, and Yvonne J. Williams.

M.B., Ch.B.—P. G. Bevan * and Jeannie E. Roulston (second-class honours); E. J. Allaway, Barbara M. Ansell,† J. R. Baker, W. I. H. Bourne, John Butler, P. Y. Carlyle, Pamela J. Chappell, Fay P. S. Cull, E. J. L. Davies, S. P. Dawson, Rosemary Dearden, W. B. L. Downing, Jean M. M. Dunn, Margaret J. Dutton, Jeanette G. Eveson, Barbara M. Finch, Frances A. Fouracres, D. M. Garratt, Joan E. Garside, N. L. Gilburn, F. R. Goodwin, P. H. T. Hall, Norah K. S. Howkins, P. J. L. Hunter, G. A. Jeffery, Jose V. Keats, H. M. Kent, D. E. T. Laird, John Lapper, Sylvia E. Leather, D. M. Maxwell, Rosemary G. Mitton, John Moss, G. C. Richards, Philip Rigby, J. M. D. Roberts, T. B. Stirling, J. E. Tremlett, G. M. Turner, Evelyn D. Watkins, F. E. Webb, K. M. Williams, J. T. H. Wise, Colin Wood, Mary P. Woodhouse; and Constance M. A. Bachtin, D. P. Fitzgerald, and G. A. Readett (in absentia).

* Distinction in medicine. † Distinction in surgery.

University of Manchester

At recent examinations the following candidates were successful:

M.B., Ch.B.—E. Margaret Bailey, B. N. Catchpole, D. A. N. Hoyte, Donald Longson, John Marshall, and K. A. Rowley (with second-class honours); Ruth A. Ainsworth, R. H. Broughton, W. B. Browne, D. A. Chadwick, C. P. Chivers, J. F. Cogan, J. K. Craig, Annie Cross, K. S. Daber, A. M. Davies, I. M. Gow, H. G. Herrmann, H. P. Hilditch, C. B. Hindley, D. P. Howarth, E. V. Hulse, Ephraim Jaffe, P. D. Kelsall, P. B. Lacy, Theresa P. Lee, Eric Levy, E. S. Lomas, Winifred M. McIlwrick, D. A. MacLeod, N. S. Moores, J. A. Noblett, Mathoor Panikkar, I. W. Payne, Edward Priestley, D. W. Purser, Anne R. Quinn, R. G. Rooney, V. E. Sherburn, K. D. Stewart, Roberta A. Stewart, J. B. L. Taylor, J. H. M. Thomas, Hilary M. Thompson, and H. W. Wylie.

University of Liverpool

The following were successful in recent examinations:

M.D.—H. Cantor, Eva V. Cooper, and J. B. Hannah.

Ch.M.—W. R. Hunter and R. A. C. Owen.

M.B., Ch.B.—G. H. Daglish, Joan Evans, R. L. Goldson, Ailsa M. Heath, Vivien P. Helme, Maureen M. Hoey, D. T. L. Hughes, G. C. Hunter, H. S. Levy, F. W. Sheffield, Dorothy E. M. Thomas, Maureen M. Tickle, and E. H. Wilson.

D.P.H.—G. P. Barclay, P. L. Bernard, H. R. G. Davies, T. B. D'Costa, E. C. Dymond, Thelma R. Gaunt, Eirwen M. Jones, A. E. Roberts, J. H. M. Tilley, Gwendoline Williams, and W. R. Williams.

University of Durham

On June 26 the honorary degree of D.C.L. was conferred on Lieut.-General Sir Alexander Hood, and the honorary degree of D.SC. on Prof. S. P. Bedson, F.R.S.

The following degrees were conferred on June 26 and 27:

M.D.—E. J. Field (in absentia); H. A. Bowes, G. A. Clark, William Dunn, John Simpson, and Malcolm Thompson.

M.S.—F. D. Hindmarsh.

M.B., B.S.—G. W. Anderson, I. S. Bruce, Frank Fleming, and H. A. Scott (in absentia); Harold Baker, H. C. Butterworth, D. V. Cashman, J. H. Davidson, W. R. Dodds, Betty B. Glansfield, Margaret M. Harley, J. R. Horler, Eva G. Maughan, J. A. S. Metcalf, M. B. Moore, Charles Neubauer, Basil Poole, H. E. Robson, P. N. Robson, Paul Szekely, Dorothy L. Taylor, Denis Whitehouse, and F. W. G. Wolff.

Queen's University, Belfast

At recent examinations the following candidates were successful:

M.D.—J. H. Scott (with gold medal); G. F. Adams, W. H. Hood, and J. A. Smiley (with high commendation); J. M. Barber and J. H. D. Millar (with commendation); J. M. Bears, A. M. Blackstock, A. A. Galley, George Gregg, R. A. Pyper, R. H. F. Smith, and E. C. Torrie.

M.B., B.Ch., B.A.O.—S. T. Armstrong, P. K. Boylan, E. J. H. Byrne, A. C. Darrah, Charles de Largy, Cristina M. Dornan, Irene M. Emerson, Mary F. Gregg, Hugh Hegan, T. D. Huriott, A. L. Hyman, W. T. Joseph, *Dorothea B. Keith*, *David Kernohan*, B. U. *Killen*, H. M. McClatchey, Dorothy McDowell, S. P. McGibbon, Doris A. McKinley, P. G. MacLarnon, Bernard Murray, John Patterson, V. R. G. Poots, James Rawe, J. E. Reid, W. B. Rodgers, Kurt Sax, W. J. W. Speedy, Vera A. Sullivan, C. A. K. Tully, Alice M. Williams, and Gordon Wolfenden.

University of Dublin

On July 3, at the school of physic, Trinity College, degrees were conferred on the following:

M.D.—C. W. Bradfield, D. P. Burkitt, R. H. Simon, and R. T. Towson.

M.B., B.Ch., B.A.O.—A. B. Boyle, R. P. Brown, T. T. Chapman, C. R. Crawford, D. F. Doherty, R. G. Emerson, P. B. B. Gatenby, Hilary Gruson, Jean F. W. Henry, John Higginson, Nathan Jaswon, Ethel O. Johnston, Joan H. Kelly, W. R. Lamb, J. R. Lowe, J. B. H. Lusk, H. F. McElligott, F. H. Moore, F. P. Myles, O. M. O'Malley, R. D. H. Parker, R. M. Pritchard, Isidore Sevitt, O. M. P. Tobias, Mona C. Warren, R. J. S. Weir, and K. H. M. Young.

Royal College of Surgeons of England

Election to the Council.—On July 4 three fellows were elected to fill the vacancies caused by the death of Sir Girling Ball and the retirement in rotation of Mr. Victor Bonney and Mr. Ernest Finch.

The result of the poll was as follows:

	Votes
E. F. FINCH (Sheffield)	625
R. P. SCOTT MASON (Birmingham)	379
JULIAN TAYLOR (University College)	364
R. OGIER WARD (St. Peter's)	356
A. LAWRENCE ABEL (Princess Beatrice)	341
R. H. MAINGOT (Royal Free)	288
GRANT MASSIE (Guy's)	276
A. E. PORRITT (St. Mary's)	276
J. B. HUME (St. Bartholomew's)	262
Sir STANFORD CADE (Westminster)	204
H. C. EDWARDS (King's College)	196
W. H. C. ROMANIS (St. Thomas's)	187
N. C. LAKE (Charing Cross)	166
W. J. FERGUSON (West Middlesex)	94

In all 1484 fellows voted; in addition 12 votes were found to be invalid.

Order of the Hospital of St. John of Jerusalem

Promotions and appointments recently announced include:

Knights.—Major A. B. Cardew, M.C., M.B.; T. H. Leggett, M.D., R.C.A.M.C.

Commanders.—Norman Jennings, M.B.; Major J. A. Mackenzie, M.B.; Norman Manson, M.B.; W. P. Kennedy, L.R.C.P.E.; H. G. Ramsbottom, L.R.C.P.E.; Lieut.-Colonel R. W. M. Strain, M.D.; Major J. F. Hamilton, M.D.; Lieut.-Colonel C. G. Booker, M.B.; Miss Margaret E. Douglass, M.D.

Officers.—N. S. B. Vinter, M.B.; C. S. C. Prance, M.B.; H. C. M. Williams, O.B.E., M.R.C.S.; H. F. Hollis, M.B.; Colonel John Revans, M.B.E., I.M.S.; Lieut.-Colonel S. LeRoy Spicer, M.D.; K. E. Dowd, M.D.; C. A. Gauthier, M.D.; William Bain, M.B.; D. J. Nicol, M.C., M.B.; Captain R. S. Harper, M.R.C.S.; T. W. A. Gray, M.D.; S. H. Keshen, M.D.; Surgeon Lieut.-Colonel H. R. L. Casolani, M.D.; Colonel T. D. Inch, C.B.E., M.C., F.R.C.P.E.; C. G. Roberts, M.D.; Major Phineas Weiner, M.R.C.S.; L. A. Sigurdson, M.D.; H. J. Porter, M.D.; G. E. Dragan, M.D.; Colonel G. R. McRobert, C.I.E., I.M.S.; V. T. Camilleri, M.D.; Miss Gladys E. Wilkinson, M.R.C.S.; Mrs. Mary Rutledge, M.B.; Miss Daphne W. Dear, M.R.C.S.; Mrs. Cecily Porter, M.B.; Miss Muriel J. L. Frazer, F.R.C.S.

Return to Practice

The Central Medical War Committee announces that Mr. P. H. NEWMAN, D.S.O., M.C., F.R.C.S., has resumed civilian practice at 66, Harley Street, W.1. (Tel.: Langham 3808).

London and Counties Medical Protection Society

At the annual meeting held in London on July 3, Sir Ernest Rock Carling, who was re-elected president, spoke of the steady increase in membership, and of the new activities of the secretary, Dr. R. W. Durand, since his return from the Forces, including especially the help he was able to give to Service members. A review of the problems referred to the society showed that time and again doctors were in difficulties because they did not keep accurate, precise, and dated records —an essential part of their work. When records had not been kept a good case could often be made to look like a bad one. Mr. G. F. Stebbing, chairman of council, gave high praise to the work of Miss K. E. Remington (assistant secretary) and Mr. S. Rayner (accountant and financial secretary) in the London office during the war: there was not a single day on which the premises were closed, and not a single meeting of the council had to be postponed because the business was not ready. Mr. W. M. Mollison, the treasurer, paid a similar tribute, and Mr. Le Brasseur, solicitor to the society, foretold that when the profession entered "the troubled waters of nationalisation" there would be more occasions than ever when members would need help and advice. Like the president, he thought that in the new National Health Service there would inevitably be many complaints against medical men, who would more than ever require professional protection.

Society for Relief of Widows and Orphans of Medical Men

At a meeting of the directors on July 3 with Dr. A. Ware, senior vice-president, in the chair, the death was reported of a widow who had been receiving relief for 35 years and had had £2475 from the society in grants for herself and two children. The sum of £1937 was voted for half-yearly grants to 53 widows. Members who have been serving in H.M. Forces but are now demobilised are asked to communicate with the secretary and give their present address; this is important because until their arrears of subscriptions are paid they are not considered members of the society. Membership is open to any registered medical man resident within 20 miles of Charing Cross, and relief is limited to the widows and orphans of deceased members. The secretary's address is 11, Chandos Street, Cavendish Square, W.1.

Scarcity of Man-power and Woman-power

In his presidential address to the National Conference on Maternity and Child Welfare on June 28, Mr. Aneurin Bevan, Minister of Health, said that the Government are deeply concerned about trying to provide for every family in Great Britain a separate household as soon as possible: "there is no more important part of preventive medicine than the provision of adequate housing." The cities are so articulate that the rural population is sometimes not heard, but in very many parts of Great Britain some of the chief sources of bad health consist in no adequate piped water-supply and no adequate sewerage system. As soon as materials and man-power are available the schemes of local authorities will be carried out. "Everywhere you turn there are more jobs to do than hands to do the jobs," but "I would rather have the headache of finding men for jobs, than the heartache of finding jobs for men." This problem of the inadequacy of man-power and woman-power, said Mr. Bevan, is expressed most tragically in the absence of a sufficient number of midwives. It is no use adding to the number of maternity beds unless the staff can be found. "We are doing our very best to try and increase the staff, the number of midwives, nurses, and domestics. We are trying to bring in midwives from countries abroad where the standards of training are equal to our own. We are also trying to persuade midwives who are doing other nursing work to come back to midwifery. And I am trying to find out why it is that so many women who acquire midwifery qualifications do not practise midwifery." For mothers who prefer to have their babies at home one of the difficulties is to provide sufficient domestic help in that domestic crisis. "Here again we are hoping to get from abroad increasing numbers of women who will be able to add to the domestic help available in this country."

PENICILLIN THERAPY.—Messrs. Boots Pure Drug Co. Ltd. have compiled a useful sixty-page booklet summarising the properties, indications, methods of administration, dosage, and clinical applications of penicillin, with a bibliography of the main publications. Obtainable, free of charge, from the Medical Department at Station Street, Nottingham.

Medical Diary

JULY 14–20

Tuesday, 16th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Prof. C. A. Lovatt Evans, F.R.S.: Outlook of Physiology Today. (Bertram Louis Abrahams lecture.)

Wednesday, 17th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Proctology.* Dr. Cuthbert Dukes: Peculiarities in the Surgical Pathology of Malignant Disease of the Ano-rectal Region. Mr. Kenneth James: Surgical Complications of Amœbic Dysentery.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
10.30 A.M. (Royal College of Physicians, 9, Queen Street, Edinburgh.) Annual meeting.
2 P.M. Prof. D. K. Henderson: Experientia docet. (Presidential address.)

Thursday, 18th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Sir Frank Colyer: Positional Variations in Animals. (Charles Tomes lecture.)
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
10 A.M. Annual meeting, continued. Prof. Alexander Gray, Prof. James Drever, Mr. D. Crichton-Miller, Dr. T. Ferguson Rodger: Education in Relation to Psychiatry.
2 P.M. Dr. W. Norwood East, the Lord Justice-Clerk (Rt. Hon. Lord Cooper), Prof. Sydney Smith, Dr. W. M. McAlister: Legal Aspects of Psychiatry.
TUBERCULOSIS ASSOCIATION
2 P.M. (Sir William Dunn School of Pathology, South Parks Road, Oxford.) Dr. F. R. G. Heaf, Dr. Donald Stewart, Mr. P. Goldberg: The Tuberculous in Industry.
5.15 P.M. Dr. William H. Feldman: Streptomycin in Experimental Tuberculosis.

Friday, 19th

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
10 A.M. Annual meeting, continued. Miss Nora Milnes, Prof. L. S. Penrose, Prof. F. A. E. Crew, F.R.S., Dr. A. S. Paterson: Social Aspects of Psychiatry.
BIOCHEMICAL SOCIETY
10.30 A.M. (Department of Biochemistry, University New Buildings, Teviot Place, Edinburgh.) Papers will be read.
TUBERCULOSIS ASSOCIATION
10 A.M. Oxford meeting, continued. Dr. H. J. Ustvedt, Dr. S. Roodhouse Gloyne: Relationship between Primary and Adult Pulmonary Tuberculosis.
2.15 P.M. Dr. Sheila Callender, Dr. A. Q. Wells, Dr. F. H. Kemp, Prof. Ida Mann, Dr. A. Robb-Smith: Sarcoidosis.

Saturday, 20th

TUBERCULOSIS ASSOCIATION
9.30 A.M. Oxford meeting, continued. Dr. André Bernou, Dr. Carl Semb: Treatment of Tension Cavities.

Births, Marriages, and Deaths

BIRTHS

CONCANON.—On July 7, in London, the wife of Dr. Austin Concanon—a son.

EVANS.—On July 1, in London, the wife of Dr. W. G. Evans—a daughter.

GAIRDNER.—On July 6, at Newcastle, the wife of Dr. Douglas Gairdner—a daughter.

HORGAN.—On June 30, in Tralee, Eire, the wife of Mr. M. J. Horgan, F.R.C.S.—a daughter.

PYRAH.—On July 3, at Leeds, the wife of Mr. Leslie N. Pyrah, F.R.C.S.—a daughter.

SCOTT.—On June 29, at Elgin, the wife of Dr. G. I. Scott—a daughter.

SPALDING.—On June 30, in London, the wife of Mr. J. E. Spalding, F.R.C.S.—a daughter.

SUTTON.—On July 4, the wife of Major M. G. Sutton, R.A.M.C.—a son.

TURTLE.—On July 5, in London, the wife of Dr. Peter Turtle—a son.

VERE-HODGE.—On July 2, at Northwood, the wife of Wing-Commander N. Vere-Hodge, F.R.C.S.—a son.

VIRDEN.—On July 6, at Stoke Poges, the wife of Dr. C. J. Virden—a daughter.

WALTON.—On July 7, at Rickmansworth, the wife of Lieut.-Colonel H. C. M. Walton, R.A.M.C.—a son.

MARRIAGES

CLYNTON REED—ROY.—On July 2, in Glasgow, J. Clynton Reed, O.B.E., M.B., lieut.-colonel R.A.M.C., to Jean Neilson Roy.

EVANS—MCCALLUM.—On July 6, at Exeter, Dr. E. Offley Evans, of Digswell, Herts, to Janet McCallum, of Exeter.

HALL—LOCKHART.—On July 2, at Wilmslow, Cheshire, Robert George Hibberd Hall, M.R.C.S., major R.A.M.C., to Elizabeth Carol Lockhart.

TWEEDIE—BINTCLIFFE.—On June 15, at Loughborough, George C. Tweedie, F.R.C.S.E., major R.A.M.C., to Gladys Mary Bintcliffe, V.A.D., R.N.

WHELDON—DIXON.—On June 29, at Chester-le-Street, John Tulloh Wheldon, M.B., to Elizabeth Jean Dixon.

DEATHS

CROFTS.—On July 7, A. Douglas Crofts, M.R.C.S., of Windsor.

NEVILLE.—On July 7, at Southminster, Essex, Thomas Crofts Neville, M.R.C.S.

SCHOFIELD.—On July 7, at Stockport, Francis William Schofield, M.B. Vict. and Lond., J.P.

WRIGHT.—On July 1, Thomas Strethill Wright, M.D. Oxfd, of Ganarew, Prestbury, Glos, aged 66.

EFFECTS OF SLOW STARVATION *

G.-B. LEYTON
M.A., M.D. Camb.

I BEGAN the present investigation as a prisoner-of-war, because I was repeatedly asked about the effects of protracted undernourishment. A thorough search of the standard works on medicine in most European languages revealed but scanty and contradictory accounts of the clinical condition associated with starvation, as would be expected from the diverse opinions expressed in the original papers (Budzynski and Chelchowski 1916, Falta 1917a and b, Hehir 1922, Hülse 1917, Schittenhelm and Schlect 1918, Weech 1936); and, though some research had been made into the effects on the blood and tissues, the results on general health and susceptibility to disease were barely mentioned.

The object of the investigation, therefore, was to discover the effects of long-continued underfeeding bordering on chronic starvation under controlled conditions of work and living, the only variables being the amount of food and the nationality of the subject. The investigation was planned in two parts: (1) A general survey of the effects of undernourishment on the manners, health, habits, and clinical condition of the patients; the early signs and symptoms of chronic starvation; and the diseases to which those suffering from this condition were especially susceptible. (2) The estimation of certain constituents of the blood in Russian prisoners suffering from moderate or severe undernourishment and presenting no other ascertainable disease. Englishmen living under similar conditions, except for the amount of food consumed, acted as controls.

LIVING CONDITIONS BEFORE AND DURING INVESTIGATION

Before admission to hospital all the patients were at work. The type of work was similar for both British and Russians. It consisted of hard manual labour of at least twelve hours a day for seven days a week, except that in every fourth week Sunday was kept as a day of rest. The work was done in stone quarries and coal mines, either underground or on the surface. To a small extent the Russians were also employed on farms, in forestry, and in saw-mills.

The accommodation was similar for both nationalities and generally consisted of wooden huts, somewhat overcrowded. Washing facilities were adequate and few patients were found to be really dirty. The British were better clad than the Russians, but both were sufficiently protected against the cold. In the hospital the food supplied by the German authorities to the two nationalities was identical. Before admission there were minor differences in type but little if any in food value. Table I shows the ration scale and nutritional value of the food per week as ordered by the German Wehrmacht. Table II shows the average daily amounts of food actually issued. Table III shows the average weekly amounts of Red-Cross food with which the British could supplement their German rations.

The weights and calorie, mineral, and vitamin values in table I were supplied by the German authorities. The values in table II are calculated from table I. The figures in table III are calculated from the known contents of the Red-Cross parcels and the food tables in Hawke and Bergeim's *Practical Physiological Chemistry* (1938).

The weight of the food supplied in the German rations was usually moderately correct, but much of the food was bad, and all was weighed uncleaned. Thus the actual amount received by each person was probably reduced by as much as a fifth. The meat was invariably weighed with bone included and was from parts with a high percentage of bone. The bread came direct from the bakery and contained much water. In the spring and early summer a large part of the potato ration was frost-bitten and inedible. As is usual where there is a shortage of food, the available supplies were all put into one container and converted into stew. The potatoes were boiled in their skins, together with the meat and dried vegetables, a minimum of salt being added. Twice a day (at 12 noon and 6 P.M.) the Russian patients received one litre of the stew, the quantity being made up by adding water to it. The stew was full of small particles of grit and often contained large stones. Generally it was exceedingly unpalatable. Besides these two meals, each man received a cup of "coffee" (150 c.cm.) and his bread and fat ration each day. This was the entire diet of the Russian patients, Russian doctors, and Russian staff of the hospital. The British received the same rations; but they could supplement their rations, and their food was cleaned, much better cooked, and contained no grit. Three or four meals a day were generally available.

The tables show that the Russians were getting theoretically about 1600 calories a day, with rather less than 60 g. of protein, nine-tenths of which was of vege-

TABLE I—SCALE OF WEEKLY RATIONS LAID DOWN FOR PRISONERS-OF-WAR IN OCTOBER, 1944

Foodstuff	Amount (g.)	Protein (g.)	Fat (g.)	Carbohydrate (g.)	Calories
Dried peas ..	138	28	1	85	461
Dried veg. ..	1400	50	4	168	908
Fresh veg. ..	350	4	0	21	100
Bread	2170	217	9	976	4853
Barley	138	15	6	91	478
Millet	138	15	6	91	478
Crushed grain ..	220	26	18	154	882
Rye flour ..	70	5	1	57	257
Potatoes	2800	64	0	537	2404
Fat	210	0	178	0	1602
Meat	250	39	34	0	462
Cheese	18	6	3	0	51
Sugar	175	0	0	170	680
Jam	175	0	0	90	360
Tea, coffee, &c. ..	14	0	0	0	0
Weekly total ..	8266	469	260	2440	13,976
Amount per day..	1181	67	37	349	1997

MINERALS

Foodstuff	Calcium (g.)	Phosphorus (g.)	Iron (mg.)
Vegetables ..	0·8	1·0	20
Bread	2·0	8·0	50
Cereals	1·0	1·0	8
Potatoes ..	..	..	30
Meat	0·1	0·4	..
Cheese	0·2	0·1	..
Weekly total ..	4·1	10·5	108
Amount per day	0·58	1·5	15·5

VITAMINS

Foodstuff	Vitamin A (I.U.)	Thiamine (I.U.)	Riboflavine (mg.)	Nicotinamide (mg.)	Ascorbic acid (mg.)
Dried peas ..	1000	500	0·1	..	10
Dried veg. ..	14,000	..	1·4	100	30
Fresh veg. ..	4000	100	0·7	..	35
Bread	1000	2000	3·0	100	..
Cereals	..	300	0·5	20	..
Potatoes ..	1000	1000	1·4	28	280
Meat, cheese, fats		..	0·1	10	..
Weekly total ..	21,000	3900	7·2	258	355
Amount per day	3000	560	1·0	37	51

Vitamin D was not present in any item. Vitamin E was present in adequate amounts in bread and cereals.

---

* Based on a thesis for the M.D. of Cambridge University.

table origin and mainly supplied in the bread. As Mitchell (1924) showed, probably only about 60% of this vegetable protein is utilisable in the human body. The fat-intake was low, being not more than 30 g. a day. The amounts of vitamin A and of vitamin-B complex were just above the bare minimum considered necessary to prevent the clinical manifestations of deficiency, and the vitamin-C intake was just above the level which gives rise to latent scurvy. Vitamin D was absent from the diet; but the mineral content was adequate (calcium 0·5 g., iron 16 mg., and phosphorus 1·4 g.).

TABLE II—DAILY RATIONS ACTUALLY ISSUED TO PRISONERS-OF-WAR

Foodstuff	Average weight before cooking (g.)	Protein (g.)	Fat (g.)	Carbo-hydrate (g.)	Calories
Bread ..	330	35	2	148	742
Potatoes ..	400	9	0	77	344
Vegetables ..	400	7	0	22	116
Fat	25	0	21	0	189
Sugar ..	25	0	0	20	80
Jam	25	0	0	13	52
Meal.. ..	15	1	0	7	32
Meat.. ..	25	5	4	0	56
Total ..	1245	55	27	287	1611

The British received these amounts and about an extra thousand calories a day from the Red-Cross food, which was in a highly concentrated form, supplying at least 30 g. of animal protein a day in the form of meat, cheese, fish, and milk, and 30–60 g. of fat in the form of butter or vitaminised margarine. The whole of the Red-Cross food was vitaminised, but the extent is not known. The combined rations provided small but appetising meals, which were usually well cooked. They were of sufficient quantity to appease the hunger of most of the British patients from one meal to the next.

GENERAL EFFECTS OF STARVATION

The following observations were made in camps in Libya, Italy, and Germany, but the majority were made and the others confirmed at the prisoner-of-war hospital at Tost, in Germany. This establishment was equipped with beds for 1000 Russians, 250 British, and 250 other nationalities, and also had an outpatient department caring for over 15,000 prisoners. Thus it gave ample clinical material for this investigation.

The reactions to the reduction of diet from that of a front-line soldier to that in table II can be divided into many stages. First, there was the loss of the natural feeling of well-being. A growing feeling of hunger followed and gradually increased in intensity until, after about three weeks, the whole thought of the prisoner-of-war was concentrated on his food. His chief concern was how long it was to the next meal, and by what means he could supplement the meagre rations. This insistent feeling of hunger remained even after years of a low diet. It appeared even to increase with time, with the result that the half-starved man would go to the greatest lengths of ingenuity and dishonesty to obtain small amounts of extra nourishment. Only when death was imminent did the desire for food slowly vanish and the grossly emaciated prisoner become resigned to his fate, of which he seemed to be aware some weeks before it happened.

The next notable abnormality was a progressive mental and physical lethargy. The desire for sleep would increase; the number of hours that an adult male would wish to remain in bed, partly dozing but for the most part in genuine deep sleep, steadily rose from the normal eight hours to sixteen or more out of the twenty-four. Finally the only way to rouse a man from his bed was by the *mention of food*. Shortly after this came rapid fatigue in mental and physical effort. The experienced card-player, for instance, would forget the cards that had been played. Part of this was certainly lack of power of concentration, but the major portion was a lack of memory for recent events, though the memory for distant ones was still normal. The young athlete trying to keep fit found that he could no longer run; even walking left him exhausted and faint. Loss of consciousness from this cause, however, was never observed. The ability to make and maintain even severe physical exertion, when life depended on it, was still present.

STAGE OF PROGRESSIVE ASTHENIA

At this stage, which differed by days or even weeks from case to case and depended partly on the size of the man, a big well-built man standing up to shortage of food less well than his smaller brother, the first definite pathological signs would appear, and the prisoner would report to the doctor with polyuria. Frequency of micturition was present both by day and by night, being sufficiently severe at times to interfere seriously with sleep. The quantity of urine passed in the twenty-four hours was increased, even reaching 4 litres a day, and the polyuria was only partly controlled by limitation of fluid intake. The composition of the urine was not abnormal, but the specific gravity was low, often about 1·005. The chloride content was also reduced, the average of twenty specimens being 0·6 g. of sodium chloride per 100 c.cm. Among a very large number of cases examined albumin was never found in the urine. On the other hand, Ehrlich's diazo reaction was often positive.

The polyuria was nearly always accompanied by a considerable loss of weight, at first rapid but becoming slower in the next two months as the polyuria subsided. The loss of weight over the first six months of underfeeding was sometimes as much as 20% of the body-weight; it was always more severe in large or fat men. Eventually some kind of equilibrium was reached, and the loss, though continuous, became very slow and was only evident when weights were compared at intervals of 1–6 months.

With this continuous loss of weight the men began to look very thin, all the subcutaneous fat being apparently used up before any gross decrease in the size of the muscles was observed. Even previously well-developed muscles decreased in size, though the men were engaged in manual labour which would normally have kept their muscles in a good state of development. The colour left the cheeks, and the conjunctivæ gradually became paler. Usually within a year the skin developed an ever-deepening lemon-yellow tinge, not unlike that seen in pernicious anæmia. This change is very characteristic of starvation.

TABLE III—WEEKLY RED-CROSS RATIONS SUPPLIED TO BRITISH PRISONERS ONLY

Foodstuff	Average amount (g.)	Protein (g.)	Fat (g.)	Carbo-hydrate (g.)	Calories
Meat	480	96	48	0	806
Butter	240	0	184	0	1696
Cheese	90	24	30	0	390
Bacon	90	9	54	0	540
Fish	240	40	0	0	160
Sugar	240	0	0	220	880
Milk powder ..	400	100	100	150	1900
Biscuits	360	36	30	252	1398
Chocolate ..	120	..	30	70	490
Jam	240	..	..	100	400
Dried fruits ..	90	4	..	72	283
Oatmeal	60	10	4	40	240
Weekly total ..	2650	319	480	904	9183
Amount per day..	378	45·5	68·5	129·1	1312

Eventually the fully developed picture ensued and continued without change until either an improvement in the rations led to recovery, or an intercurrent infection (generally a rapidly advancing tuberculosis) to a speedy death. Only a few patients died of inanition due to lack of food without evidence of any other disease. The final stages of pure starvation were never seen among the British, who seldom progressed beyond the stage of polyuria before further rations were available which led to a rapid recovery. On the other hand, if chronic dysentery were present, and this was by no means rare, on an even moderately reduced diet all the signs of chronic starvation supervened and deaths were frequent.

FULLY DEVELOPED PICTURE OF STARVATION

Muscular action became progressively slower, and the reaction times (which could not be measured owing to lack of apparatus) increased. Patients in the X-ray room, when told in their own language to place their hands on their head, showed a long lag, as though the order had not been heard or would not be obeyed, but in the end, very slowly and one movement at a time, the arms would be raised and placed in the required position. The rate at which conversation was carried out was equally slow, very often minutes would pass before the answer to a question could be obtained. Frequently the question would be repeated when, after a long pause, the patient said he had heard it the first time. This exceedingly slow cerebration was always present in advanced cases of inanition.

The gait, instead of being smart and military, became a shuffle. The feet seemed to be pushed forward over the ground rather than lifted and placed down again. This was particularly obvious on rough ground, where the patients would stumble over the smallest obstruction. There was a perceptible pause between each step, as if it were too much of an effort for the man to lift his feet and move forward. The whole performance was very similar to a slow-motion picture, except that the feet slid forward instead of being lifted.

At work these men were particularly prone to accidents; for, though they could see that a fall of rock or of a branch of a tree was imminent, their actions were too slow to enable them to move out of danger.

At this stage all were completely apathetic and more or less resigned to a feeling of constant weakness, though they all said they would soon be fit if they could only get enough to eat. Their only thought was food. Sexual desire was reduced but seldom completely lost, and in a few cases it became all-absorbing, though the man was to all appearances in the last stages of inanition. The longing for books, games, and other recreational pleasures slowly vanished, but the desire for alcohol remained and that for tobacco was greatly increased. Many men would sell even their meagre rations for a small quantity of tobacco. Moral standards were completely in abeyance, for a man would steal his best friend's rations or sell his overcoat for food or tobacco. The whole attitude was strongly reminiscent of hungry animals waiting for food. Standards of cleanliness were far below normal, and any pride in personal appearance was entirely lost.

PHYSICAL EXAMINATION

Little was found on physical examination except extreme emaciation. The tongue was occasionally atrophic but seldom glazed. Sight was good, only the exceptional cases having even mild night-blindness. Hearing was normal or very acute. No thyrotoxicosis was seen, and only one case of purpura, in a man who came from a hæmophilic family but was not considered to be hæmophilic himself. A noteworthy abnormality was the lowered body temperature, an average of 100 cases at 4 P.M. being as low as 35·7° C (96·3° F).

Circulatory System.—The heart sounds were normal and often very clear and loud, no doubt because of the thinness of the chest wall. The average pulse-rate of 100 hospital patients after they had walked from the wards to the pathological laboratory (a distance of not less than thirty yards) was 47 per min., with extreme limits of 90 and 34. On exercise, which consisted of walking up and down stairs for a minute, the pulse-rate seldom rose above 80 per min., and it returned to its original level in under 5 min. The blood-pressure was also reduced, the average of 100 cases being 107/71 mm. Hg. The lowest recorded with no organic disease was 88/55 mm. Hg.

Respiratory System.—The chest movements were for the most part normal. The breath sounds were clear, and added sounds were unusual. A small percentage of patients with œdema of the feet and legs also had a small pleural effusion which cleared up with the other œdema under treatment. The respiration-rate was slow the average of 50 cases in the standing position being 10·6 per min.

Gastro-intestinal System.—The abdomen, except for the lack of muscles and fat, showed little change. "Pot belly" was not seen. The spleen and liver were not palpable. Free fluid in the abdomen was detected in only 5% of those with œdema. The gastric content showed all types of curves, from complete achlorhydria to gross hyperchlorhydria. There was, however, a tendency for the free acid to be slightly above the normal limits. An examination of 50 test-meals performed on these patients showed that in 29 cases the acid secretion was within the normal limits; 4 were completely achlorhydric; 6 had a moderate hypochlorhydria; and the remaining 11 showed various degrees of hyperchlorhydria. In 6 cases the free acid was as high as 100 c.cm. of N/10 acid %. Thus the reaction of the stomach to the slow starvation was not consistent and showed a variation such as might be found in a well-fed community, but with a greater tendency to abnormality and a slight deviation towards hyperchlorhydria.

Nervous System.—All the reflexes were sluggish, but complete absence of knee or ankle jerks was never observed. The eyes reacted normally to light and convergence. Sensation of touch and of temperature was normal.

Skin.—The skin was generally healthy, and ulcers of the legs, furuncles, &c., were not abnormally common. In almost all cases the skin was much yellower than normal, particularly the face. The colour persisted for months after all other symptoms had subsided, but it eventually faded, and the normal colour returned. Only two cases of pellagra, with its typical skin lesions, were seen.

PREVALENCE OF DISEASE

The incidence of acute disease—e.g., malaria and dysentery—in British and Russian patients was very similar. Chronic disease—e.g., nephritis, diabetes, carcinoma, and syphilis—was as rare as would be expected in the type of patient examined. A most remarkable difference was shown, however, in the incidence of pulmonary tuberculosis. Among the British the figure was similar to that at home, radiography of about 500 patients showing an incidence of lung lesions in about 1·2%. Among 2000 Russians radiography detected tuberculous infiltration in 15%, and a further 4% had pleural effusions which were almost certainly tuberculous. Of the 2000 Russians examined, 184 had *Myc. tuberculosis* in the sputum, and this in a hospital that did not receive patients already diagnosed as tuberculous.

The types of this disease were somewhat different from those generally seen in England. The onset was more rapid, and the commonest type almost bronchopneumonic. Very seldom was chronic fibroid phthisis seen. The course was extraordinarily rapid, the patient often dying in less than six months after radiography had shown no sign of disease. The reaction to the infection was very poor. The pulse-rate remained within normal limits until shortly before death, and the classical evening temperature was only found in the most advanced cases. Clinical œdema was no commoner in the tuberculous than among the rest of the patients. Necropsy revealed that the final cause of death was not often generalised miliary tuberculosis, the disease being usually confined to the lungs, where large cavities and massive tissue breakdown were most typical. Tuberculous ulceration of the gut was occasionally present. Only one case of Addison's disease was seen, and this was found to be due to tuberculous infection of the suprarenal glands.

CHANGES IN THE BLOOD

The second part of the investigation was intended to be a complete chemical analysis of the blood of patients, both Russian and British, admitted to Tost Hospital among whom no infective or neoplastic focus could be found. Among the British these were obtained from the staff and patients admitted for minor injuries. The classes of Russian patients were similar and included those with, or who had had, progressive asthenia or œdema without any other demonstrable organic lesion. The figures of the British cases were taken as controls and as a base-line for the Russian figures.

Preliminary investigation showed that it would be impossible to examine all the important constituents of the blood in all cases; hence it was decided to estimate the blood-sugar, hæmoglobin, total plasma-proteins, and erythrocyte-sedimentation rate (E.S.R.). These estimations were done on 51 British and 153 Russian patients; 46 of the Russians had clinical œdema at the time of the investigation, and many others had had it in the past.

Technique.—The morning after the day on which X-ray screening of the chest had excluded the presence of pulmonary tuberculosis 5–10 c.cm. of blood was removed from one of the arm veins without the application of a tourniquet, to avoid stasis. The blood was placed at once in a tube containing about 2·5 mg. of potassium oxalate per c.cm. as an anticoagulant. The whole of the investigations were carried out on this blood, and were begun immediately after its withdrawal. The blood was taken from the patient before breakfast; thus all estimations are fasting values.

Methods.—Blood-sugar was estimated by the methods of Folin and Wu or of Maclean. Hæmoglobin was determined by the acid hæmatin method of Sahli; the instrument was calibrated for 16 g. of Hb per 100 c.cm. of blood to read 100%. The method of Greenberg was used for most of the estimations of plasma-protein. The E.S.R. was determined in Westergren tubes, readings being taken at the end of the first and second hours.

An examination of the 51 British patients showed that the level of the plasma-proteins was generally slightly lower than would be found in men of a well-nourished population. The average of the 51 cases was 6·5 g. per 100 c.cm., which is the lower limit of normal, but probably only 5 cases with the plasma-protein level below 6 g. per 100 c.cm. are really pathological. This constitutes but 10% of the whole series. The Hb readings vary between 115% and 80%, with an average of 96%. Thus this class of patient showed no serious anæmia. All the blood-sugar estimations except one were within the normal limits. The E.S.R. was seldom abnormal, exceeding 10 mm. at the end of the first hour in only 3 of the 51 cases. The average of 5–10 mm. is greatly raised by one case (62–92 mm.), and without this the mean would be 3·8/5·3 mm.

The Russian figures disclose a vast difference. In only 2% of the Russians was the plasma-protein level above 7 g. per 100 c.cm., against 28% of the British; 75% of the Russians had a plasma-protein level below 6 g. per 100 c.cm. against only 10% of the British. The average for the 153 Russians was 5·3 g. per 100 c.cm., with a range from 2·8 to 7·5 g. per 100 c.cm. The Hb ranged from 105% to 44%, with a mean of 82%. Thus the average Russian under investigation had some degree of anæmia. The average of the blood-sugar estimations at 81 mg. per 100 c.cm. was lower than in the British but was within normal limits, and these figures showed much less variation than any of the other constituents, since all fell between 69 and 100 mg. per 100 c.cm. In 40 cases the blood-sugar level was between 70 and 80 mg. per 100 c.cm., indicating slight hypoglycæmia. The E.S.R. was in most cases extraordinarily high, only 15 patients (10%) showing a fall of less than 10 mm. in the first hour. Some very high readings were obtained (up to 140 mm. in the first hour), and the average of 40–65 mm. would never be found in a fit community. It was noteworthy that some of the cases with œdema had a normal E.S.R. Clinical œdema was present in 41 cases (26%); it developed in a few patients with a plasma-protein level of 5·3 g. per 100 c.cm. and in all patients with a level below 4·8 g. Table IV shows the average value of the three other constituents for groups of plasma-protein level among the Russians.

TABLE IV—BLOOD ANALYSES IN 153 RUSSIANS

Plasma-protein (g. per 100 c.cm.)	No. of cases	Average Hb (%)	Blood-sugar (mg. per 100 c.cm.)	E.S.R.* (mm.)	Œdema
Above 7·0 ..	3 (2%)	95	90·0	25–51	Nil
6·5–6·9 ..	6 (4%)	93½	86·0	27–49	,,
6·0–6·4 ..	28 (19%)	88	85·0	28–51	,,
5·5–5·9 ..	33 (21%)	85	83·0	45–70	,,
5·0–5·4 ..	38 (25%)	82	82·0	44–64	13%
4·5–4·9 ..	24 (15%)	78	81·5	36–63	66%
4·0–4·4 ..	12 (8%)	82	81·0	46–79	100%
Below 4·0 ..	9 (6%)	69	79·0	79–106	100%

* Average in 1 hr. and 2 hr.

The only abnormality shown by the first three groups (above 7·0, 6·5–6·9, and 6·0–6·4 g. per 100 c.cm.) is in the E.S.R., which is raised in all three to about the same degree, 20–30 mm. in the first hour, and 40–60 mm. in the second hour. As the plasma-protein level decreases, the Hb and the blood-sugar level follow but can scarcely be considered pathologically low. These three groups constitute only 25% of all the cases.

In the groups with a plasma-protein level of 5·5–5·9 g. per 100 c.cm., which provided 21% of the cases, the Hb average had fallen to 85%, which must be considered pathological for the adult male. The blood-sugar level was still within normal limits, but the E.S.R. had increased to the extent of 45 and 70 mm.

The group with a plasma-protein level of 5·0–5·4 g. per 100 c.cm. showed a further decrease in the Hb and blood-sugar level, but no alteration in the E.S.R. It contains the first few cases of clinical œdema, in 13% of the group, constituting 25% of all cases.

The groups with plasma-protein levels of 4·5–4·9 and 4·0–4·4 g. per 100 c.cm. were similar to the preceding group, except that clinical œdema was present in 66% and 100% of the respective groups.

In the group with a plasma-protein level below 4 g. per 100 c.cm., which was only 6% of all cases, gross anæmia had developed, the average Hb had fallen to 69%, and even the blood-sugar level verged on mild hypoglycæmia at 79 mg. per 100 c.cm. The average E.S.R. was 79–106 mm., an astonishingly high level, even allowing for the anæmia.

SIGNIFICANCE OF BLOOD CHANGES

British Cases.—The changes in the blood of the British cases are so slight that it must be concluded that the diet was adequate in those factors from which the blood components are formed. This indeed would be expected, since the calorie value of the diet was 2759 a day, which would be considered sufficient for all except those engaged in the hardest labour. The figures demonstrate that the methods and instruments used could be trusted to give reliable readings, as shown by normal results in healthy patients.

The average *plasma-protein* level in the 51 British cases is slightly below that generally stated to be normal for a healthy man. Three cases in which it was considerably reduced may have been due to the large size of the patient or to the hard work which a few of the patients had had to undertake before admission. As would be expected from the levels, none of the cases showed clinical evidence of hypoproteinæmia.

The average E.S.R. was normal, as would be expected among healthy males. It is likely that in those few cases in which it was raised this was only transitory, as was found to be so in two of the patients.

The *hæmoglobin* level was the normal for the healthy male. The high level was no doubt in part due to the very adequate iron supply of the diet.

The *blood-sugar* level was in every case within the normal range, but was usually rather lower than would be expected in the average healthy adult male.

Russian Cases.—A very large percentage of the Russians showed considerable abnormality in all the constituents of the blood that were examined, and in no case was there no abnormality.

The great majority of the Russians had a blood deficient in *plasma-protein.* It would have been surprising if they had not, since the daily calorie intake of 1350 with less than 60 g. of protein (almost all vegetable) might on theoretical grounds be just sufficient for a man at rest in bed if the food was of good quality. It was certainly insufficient when the food was coarse and of the type in which, according to Mitchell (1924), as much as 50% of the protein may be lost in the fæces and the man was expected to perform a full day's work. The plasma-protein level usually had to be 20% below the lower limit of normal before clinical symptoms and signs began to appear.

Œdema, one of the first symptoms to bring the cases to a doctor, only began when the plasma-protein level fell below 5·3 g. per 100 c.cm., and did not become universal until the level was below 4·6 g. The diet was sufficient in vitamins, and none of the cases presented any evidence of renal disease or cardiac failure; so it must be concluded that the œdema was a direct result of undernourishment. The fluid, salt, and vitamin intake was the same for all, and œdema developed only in those cases in which the plasma-protein level was considerably reduced. It therefore appears that a reduction in the concentration of this constituent of the blood is an important factor, if not the only one, in causing the œdema of undernourishment.

This hypothesis is supported by the fact that in those cases in which extra protein was given, and the protein concentration of the blood thus increased, the œdema subsided. It recurred when the plasma-protein level was allowed to fall to 4·7 g. per 100 c.cm. This conclusion is the reverse of that drawn by Hülse (1917), who found that there was no relation between blood hydræmia and œdema. On the other hand, it agrees with the findings of Liu et al. (1931b) and Weech (1936). Hehir (1922) did not mention any cases of œdema in his report on starvation; this may have been due to the short period of privation suffered by his patients, but it seems to be more easily explained on the grounds that his men were fed almost exclusively on meat, which might be expected to keep the plasma-protein level abnormally high for people suffering from starvation.

The plasma-protein level (4·6–5·3 g. per 100 c.cm.) at which œdema began in the Tost cases was somewhat lower than the 5·0 to 5·2 g. per 100 c.cm. stated by Moore and Van Slyke (1930) to produce œdema in nephrosis and nephritis, but close to the level found by Liu et al. (1931b) in nutritional œdema. That a higher level of the plasma-proteins is necessary to prevent œdema in nephritis can be explained by the increased capillary permeability commonly present in renal disease. It seems probable that the sole cause of the œdema in the present series was a reduction in the osmotic pressure of the blood due to lack of the plasma-proteins, with a result that water diffuses from the blood into the tissues.

The theoretical level of the plasma-proteins (with normal albumin-globulin ratio) necessary to keep the osmotic pressure of the blood above that of the capillary pressure is generally given as 5·0 to 5·3 g. per 100 c.cm. The capillary pressure in subnutrition may be taken as reduced, since the blood-pressure and pulse-pressure in these cases are both low. Thus the filtration pressure is reduced, and a smaller osmotic pressure of the blood would maintain the normal equilibrium of the fluids in and outside the vessels. Also, considerable œdema is present before it is detectable clinically. The small discrepancy between the theoretical figures and those found in this investigation are thus explained.

It has been stated that œdema often develops in starvation without a reduction in the level of the plasma-proteins. This happened frequently among the patients at Tost, but in all those cases some other organic lesion besides starvation was present. Is it not likely that this explains the diverse opinions of the many conflicting reports on the relation of the plasma-proteins to œdema and starvation?

The raised E.S.R. was by far the most obvious abnormality discovered. In less than 5% of the cases was the fall within normal limits, and in most cases it was grossly raised. The increase in the E.S.R. is probably the first sign that the body is not receiving sufficient nourishment; but the reason for the rapid fall of the red cells in undernourishment is obscure, and no reference has been made to it in previous publications outside Russia. It is well known that an increase in the rate of fall of the red corpuscles is usually associated with an exudative process. The actual rate of fall depends on many variables, but Gordon and Wardley (1943) showed that one of the chief factors was the ratio of the types of protein in the blood; fibrinogen, euglobulin, and crystalbumin increasing the rate of fall, while albumin, pseudoglobulin, and globoglycoid slowed it. The absorption of any body exudate is said to increase the fibrinogen content of the blood and thus give rise to a more rapid fall of the red cells. Bruckman et al. (1930) observe that there is some alteration in the albumin-globulin ratio in chronic starvation, and therefore it is likely that the early rise in the E.S.R. merely reflects a change in this ratio, which may even be too small to be recognised by routine methods of analysis. In starvation such a change probably indicates that the food intake is too small, and that there is an adverse nitrogen balance, with the body absorbing its own proteins. This seems to happen just as soon as the reserves of carbohydrate and fat are exhausted, even when the food contains sufficient protein to keep a positive nitrogen balance, if there were an adequate intake of other food to provide the necessary calories (Jansen 1917).

Clearly the change in the proteins is only one factor in causing the increase in the E.S.R. in starvation, for both the decrease in numbers of the red blood corpuscles and the general blood hydræmia would tend to produce a more rapid fall of the suspended cell, though not to the very high level recorded in the present cases. That the change in the constituents of the blood, rather than the actual level of the hæmoglobin and plasma-proteins, is the chief factor in raising the E.S.R. is clearly demonstrated, since five patients whose blood-proteins were reduced to 4·5 g. per 100 c.cm. and who had a considerable degree of anæmia (which should have increased the E.S.R.) had rates well within normal limits. This is in agreement with the findings of Aldred-Brown and Munro (1935).

All previous workers except Weech (1936) have emphasised that in chronic starvation the *hæmoglobin level* is invariably much reduced. In the present cases this reduction is less notable. Looking at it broadly, since hæmoglobin is a protein in combination with iron, and the diet of the Tost patients was adequate in its iron content, it might be expected that the level of the hæmoglobin and that of the plasma-protein would move down in step. This was so at Tost, though the rates varied. At the beginning the hæmoglobin was more affected than the plasma-proteins, but later the reverse was the case. This conforms with the general rule that the body maintains its essential elements at the expense of the less necessary tissues. The reason why previous workers found a much more severe fall of the hæmoglobin content of the blood may have been that the iron in the diet was much less than even the minimum received by the present cases.

The *blood-sugar* was by far the best maintained of all the constituents of the blood examined in these starvation cases. It is true that there is a progressive fall in the reducing substances as one passes from the better to the less well-nourished groups, but the difference in the average is less than 10%, and even the lowest reading recorded was but slightly below that sometimes found in a fasting but well-nourished person; at 69 mg. per 100 c.cm. it was well above the level which gives rise to serious hypoglycæmic symptoms. It must be remembered, however, that a percentage fall comparable to that of the plasma-proteins or of hæmoglobin would probably be incompatible with life. The slight decrease in the blood-sugar would explain the feeling of weakness and dizziness on exertion, and explain why consciousness was never lost even on long marches carried out by these men in very cold weather, since under these conditions the extra adrenaline secreted should mobilise the small reserves still available.

SIGNIFICANCE OF OTHER FINDINGS

The estimations of free and total *acidity of the gastric contents* after a test-meal show a much higher percentage of cases of normal or hypersecretion of acid, and fewer cases of achlorhydria than would be expected from previous reports. The cause of this is not clear, since all had been on a diet which is generally considered (if taken for a short period only) to reduce the acid secretion of the stomach. It may have been partly due to the lowered blood-sugar often present. The diet was, however, better in both quality and quantity than that of Hülse's (1917) patients. Also, all the patients had been so long on a poor diet that the stomach may have become accustomed to the different type of food with which it had to cope.

In common with all previous reports except that of Enright (1920) no albumin was found in the *urine*. The low specific gravity and chloride content were in part certainly due to the considerable quantity of fluid consumed and to the poor supply of salt. The underlying cause of the intermittent polyuria is difficult to understand. It cannot be attributed to a raised blood-pressure, for this was invariably low. The fluid intake was moderately constant and would not explain the periods of excessive excretion of urine. Since the output was erratic, it may be that a small change in the diet was sufficient to vary the blood-protein level from above to below the critical level for œdema and thus let latent œdema develop. A small increase in diet would then raise the level of the plasma-proteins again, and water would be reabsorbed from the tissues and excreted as urine. For this reason the patient's weight is a very unreliable method of estimating the degree of his undernourishment or his progress, since at least 10 lb. of excess fluid can be retained before there is any clinical sign of œdema. On the other hand, the polyuria may have been due to some change in the body metabolism, since Ehrlich diazo often reacted positively during polyuria. The nature of any such change was not revealed by the present investigation.

A reduction in the normal *body temperature* and decreased heat production have been observed by many investigators (Hehir 1922, Levy 1906, Zuntz and Loewy 1918) in cases of emaciation, but an almost equal number have reported a raised temperature (Enright 1920, Hülse 1917, Falta 1917a). Among the cases of starvation investigated at Tost the body temperature was well below normal, the average being 35·7° C (96·3° F) at 4 P.M., and patients with acute illness often had subnormal temperatures. This could not be attributed to the weather; for, though the temperature out of doors was at times below freezing-point, the hospital was well heated, and the temperature of the British contingent, living under the same conditions except for better food, was at the recognised normal level in health and in disease displayed the expected increase. Thus in assessing the temperature of a patient with starvation and intercurrent disease a lower base-line for normal should be accepted. At Tost this was 35·7° C (96·3° F), giving a temperature of 37° C (98·6° F) the same significance as one of 38·5° C (101·3° F) in a better-fed patient.

The published work is more generally in agreement about the reduction of the *heart-rate* than about the lowering of the body temperature, and only Enright (1920) insists that in all his cases the rate was increased. In the absence of intercurrent infection all the cases of starvation seen by me had a reduced heart-rate, and in the severely undernourished the average resting rate was 47 per min. The heart-rate was slowed during and after exercise. This upsets the explanation usually given for the slower rate—namely, that in starvation there is a lowered basal metabolic rate. It is suggested that under these conditions less oxygen is required by the tissues, with a proportionate reduction in the speed of the circulation. Plausible as this theory is, it no longer fully explains the facts, and it appears that the asthenia which definitely affects the skeletal muscles also affects the heart. The general decrease in irritability of the nervous system may also play its part in reducing the heart-rate.

SUBJECTIVE AND TEMPERAMENTAL EFFECTS

The sensation of persistent *hunger* is the body's answer to lack of sufficient nourishment. It is almost always present when too little food is being ingested, but it can generally be said to disappear after the first few days of complete fasting. Although not commented on in the early writings, the longing for food of the chronically undernourished people was clearly present. Whether the desire for food causes the secretion of the digestive juices, or the continued secretion of the juices without adequate food intake propagates the feeling of hunger, must at present remain a matter of speculation; but it is evident from the test-meals that the secretory power of the stomach is well maintained. It is certain that this persistent hunger, which is of a different intensity from that normally felt before meals, completely alters the character and outlook of the starving man and is perhaps the chief cause of his moral degeneration.

The changes in the *nervous system* were constant and uniform. The loss of memory, the confused and uncooperative state, the slowness of mental reactions, the lack of power of concentration, the rapid fatigue of the mind, the slowed movement. and the sluggish reflexes, can all be explained by a depression of the vital activity of the nerve-cell. Similar effects have been observed in severe anæmia (Wolff 1936) and among people exposed to a reduced oxygen tension at high altitudes. It has been proved that in these conditions the cause is poor oxygenation of the tissues (Leedham 1938). Though some of the effects of starvation on the nervous system can be explained in this way (the slower heart-rate would not improve matters), neither cyanosis nor dyspnœa is present in undernourishment. May it not be that the reduction in the plasma-protein level only indicates that all the body tissues are suffering from part of a general protein-starvation, and that this is the underlying cause of the depression of the nervous system? This depression cannot be explained by an abnormal blood-calcium level, since this is normal or reduced in starvation and not increased.

The effect of starvation on the *mental outlook* of the patient can roughly be assessed according to his outlook before starvation. His power of self-control and his conduct as a civilised being last just so long as he can maintain the veneer he has developed in society. None of the other hardships suffered by fighting men observed by me brought about such a rapid or complete degeneration of character as chronic starvation, and it seems that the silent areas of the brain which control the character suffer very early from deficient nutrition. Besides this it must be remembered that the instinct of self-preservation is one of the most powerful in animal life, and modern civilised man's existence is seldom threatened by lack of food; hence it is not surprising that the half-starved man will go to any lengths, even stealing from his friends, to obtain food when his life is endangered by starvation. Once the first barriers are broken down, deterioration proceeds rapidly, especially when he sees others behave like him.

RESISTANCE TO DISEASE

That the *liability to the common acute infections* did not seem to be increased is difficult to understand, but it may have been due to the reduction in the chances of infection from outside sources. If infection ensued, the rate of recovery was slower than normal, probably because the basal metabolism, and with it the antibody production, was less active than in well-nourished people.

The difference in the incidence of *tuberculosis* between the British and Russians is most interesting, for the only variable factor was the food. The living conditions, the work, the length of time that the men had suffered from the hard conditions, and even the chances of infection from outside were exactly similar for the British and the Russians, yet the Russians were extraordinarily susceptible to tuberculosis of the lung, whereas the British maintained about the same standards of immunity as are found in the British Isles. Seldom can the incidence of pulmonary tuberculosis have reached the figure of 20% of active disease in one section of a community while others living under precisely the same conditions (except for one factor) gave as low a figure as 1·5%. This appears to suggest very strongly that either a major factor in adult phthisis is one of nutrition, or that the British have acquired a much higher general immunity, and that exposure to infection plays only a small part.

Since the deaths from tuberculosis in Russia are given for the year 1927 as 142 per 100,000 living, which is half as much again as the figure for 1927 in Britain, and the incidence of tuberculosis among the Russians at Tost was 15 times that of the British, it must be presumed that the lack of food, and not poor natural immunity, was the main cause of the exceptionally high incidence of tuberculosis among the Russian prisoners-of-war. The very low fat-content of the diet, besides the general lack of food, may well have reduced the Russians' resistance to tuberculosis; but, whatever the cause, there is no doubt that some factor had so altered the reaction of their body to infection that, once this had taken place, its progress was more like that of an acute disease than a chronic granuloma. That this was not due to exceptional virulence of the infecting organism is proved by the normal course of the disease among the few British patients who contracted it.

PROGNOSIS

Most previous writers have stated that, even early in starvation, irreparable changes in body tissues take place, and complete recovery is impossible. Hehir (1922) even states that his cases reached a state in which death was inevitable some weeks before it took place. This was not my experience. Provided that no concomitant organic disease was present, the chance of recovery was excellent, even if only a slight increase of diet was possible. The general principle of supplying small meals often was impracticable, and the Russians ate all that was available at one meal, usually without any ill effects whatsoever. Irreversible changes noticed by previous workers may have been due to vitamin deficiency and not merely to undernourishment. This theory is partly confirmed by the complete recovery, both mental and physical, which took place in the Tost cases and certainly would have been impossible if they had shown advanced changes such as are found in beriberi and pellagra, both of which were present in previous reports of starvation.

CONCLUSIONS

By combining previous reports with my own investigation, it is possible to present a moderately clear picture of the effects of chronic starvation and to correlate the clinical condition with some of the changes in the blood. Thus the main clinical features of starvation are, in order of their appearance, loss of feeling of well-being, rapid physical and mental fatigue, increased desire for sleep, and loss of memory for recent events. The next stage produces clinical signs, of which the most important are bouts of polyuria, decreased pulse-rate, lowered blood-pressure, lowered basal metabolic rate, and reduction in temperature. Œdema as a direct result of lack of food is a late sign. The change in the mental outlook is part of the syndrome and develops concomitantly with the physical changes.

There are constant changes in the blood. The first of these is usually a raised E.S.R., which is soon followed by a moderate progressive anæmia and a reduction in the plasma-protein level. There is a definite relation between the plasma-protein level and clinical œdema. The critical level varies from case to case but always lies between 5·3 and 4·6 g. per 100 c.cm. and is generally 4·8 g. per 100 c.cm. The change in the white blood corpuscles is a leucopenia with a tendency to eosinophilia.

The liability to the acute infections is not greatly increased by chronic starvation, but the incidence of tuberculosis among the half-starved is many times that found in well-nourished people.

The recovery from chronic starvation in the absence of organic disease or vitamin deficiencies is excellent and complete, provided the patient is not moribund before further rations become available.

I am indebted to Major H. M. Marks for the radiological reports, and Captains A. Norman and R. Solomon for supplying much of the clinical material.

REFERENCES

Aldred-Brown, G. R. P., Munro, J. M. H. (1935) *Quart. J. Med.* 4, 269.

Bruckman, F. S., D'Esopo, L. M., Peters, J. P. (1930) *J. clin. Invest.* 8, 577.

Budrynski, B., Chelchowski, K. (1916) *J. trop. Med.* 19, 141.

Enright, W. (1920) *Lancet*, i, 314.

Falta, W. (1917a) *Wien. klin. Wschr.* 30, 1637.

— (1917b) *Münch. med. Wschr.* 64, 1539.

Gordon, C. M., Wardley, J. R. (1943) *Biochem. J.* 37, 393.

Hawke, P. B., Bergeim, O. (1938) Practical Physiological Chemistry, London.

Hehir, P. (1922) *Brit. med. J.* i, 865.

Hülse, W. (1917) *Münch. med. Wschr.* 64, 921.

Jansen, W. H. (1917) *Dtsch. Arch. klin. Med.* 74, 1.

Leedham, C. L. (1938) *J. Aviation Med.* 9, 150.

Levy, M. (1906) *Z. klin. Med.* 9, 177.

Liu, S. H., Chu, H. I., Li, R. C., Fan, C. (1931a) *Proc. Soc. exp. Biol., N.Y.* 29, 252.

— — Wang, S. H., Chung, H. L. (1931b) *Ibid*, 29, 250.

Mitchell, H. H. (1924) *Physiol. Rev.* 4, 424.

Moore, N. S., Van Slyke, D. D. (1930) *J. clin. Invest.* 8, 337.

Schittenhelm, A., Schlect, H. (1918) *Berl. klin. Wschr.* 55, 1138.

Weech, A. A. (1936) *Int. Clin.* 2, 223.

Wolff, H. G. (1936) *Physiol. Rev.* 16, 545.

Zuntz, N., Loewy, A. (1918) *Biochem. Z.* 90, 244.

TUBOCURARINE CHLORIDE AS AN ADJUNCT TO ANÆSTHESIA

REPORT ON 180 CASES

FREDERICK PRESCOTT
M.Sc., Ph.D. Lond., M.R.C.S.
CLINICAL RESEARCH DIRECTOR, WELLCOME RESEARCH INSTITUTION

GEOFFREY ORGANE
M.D. Camb., D.A.
ANÆSTHETIST, WESTMINSTER HOSPITAL

STANLEY ROWBOTHAM
M.D. Durh., D.A.
ANÆSTHETIST, ROYAL FREE HOSPITAL AND CHARING CROSS HOSPITAL

CURARE, which has the property of paralysing skeletal muscle, is an extract of the bark of several species of plants used by the South American Indians as an arrow poison. Two preparations with a curare-like action are available commercially, and it is essential, if accidents are to be avoided, to distinguish between them. One is 'Intocostrin,' a purified extract obtained from the plant *Chondodendron tomentosum*, which grows mainly in the upper regions of the Amazon and the eastern slopes of the Ecuador plateau. It is physiologically standardised to contain 20 units or 20 mg. of "curare extract" per ml. The other preparation available, and used by us, is *d*-tubocurarine chloride (also known commercially as curarine chloride), which was first isolated by King in 1935. The dose of this is specified by weight. Each unit of intocostrin is stated to be equivalent to 0·15 mg. of *d*-tubocurarine chloride when assayed on rabbits (Council on Pharmacy and Chemistry 1945). The potency of these drugs, however, depends on the species used for testing, and in man it appears that 1 unit of intocostrin is equivalent in potency to 0·3 mg. of *d*-tubocurarine chloride. Intocostrin has been used since 1942 to produce muscular relaxation in abdominal surgery, and the dosage and technique have been worked out by American and Canadian investigators (Griffith 1944, Griffith and Johnson 1942, Cullen 1944). *D*-tubocurarine chloride, although known since 1935, has only recently been used as an adjunct to general anæsthesia (Gray and Halton 1946).

All drugs with a curare-like action paralyse skeletal muscles by blocking the nerve impulse at the myoneural junction, probably by preventing the effector substance in voluntary muscle from reacting to acetylcholine. The work of Gross and Cullen (1945) appears to confirm the view that they act anywhere in the nervous or muscular system where acetylcholine is the chemical mediator. They also block synaptic transmission between preganglionic and postganglionic fibres of the sympathetic nervous system. There is evidence that curare-like drugs block peripheral response to vagal stimulation (Mautner and Luisada 1941). Their effects are rapidly reversible owing to rapid elimination from the body, partly by destruction in the liver and partly by excretion unchanged by the kidneys. The urine of one of us, collected within a few hours of receiving a dose of 30 mg. of *d*-tubocurarine chloride, exerted a curare action on muscle. Choline esters, physostigmine, and 'Prostigmin' (neostigmine) antagonise the action of curare-like drugs. *D*-tubocurarine chloride has a pure curare action, and in the doses in which we have used it has no toxic side-effects on the heart and cardiovascular system like many of the other curare alkaloids or crude curare preparations, which are thus unfit for clinical use. These may depress cardiac muscle, lower blood-pressure, and produce bronchospasm and histamine-like reactions.

PRELIMINARY OBSERVATIONS

Before any extensive use was made of *d*-tubocurarine chloride as an adjunct to anæsthesia, the effect of the drug was observed on one of us (F. P.) to obtain information on dosage and the best method of administration.

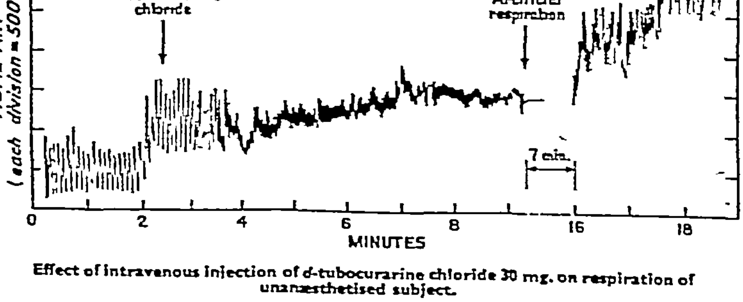
A dose of 10 *mg. given intravenously* produced only partial loss of muscular power, a feeling of weakness, ptosis, strabismus, and diplopia; the subject was still able to flex and extend the limbs. Diplopia was produced by a dose as small as 1–2 mg. A striking difference was noted after the injection of 20 mg. intravenously. Strabismus, diplopia, ptosis, and a feeling of weakness developed in less than a minute, and within two minutes the muscles of the face and neck became paralysed. *Paresis rapidly spread to the muscles of the larynx*, limbs, abdomen, and intercostals, in that order. Speech was lost, but swallowing and coughing were not impaired with this dose. The subject had a mask-like facies and ptosis similar to that seen in myasthenia gravis. The rate and depth of respiration while the subject was breathing pure oxygen were not consciously affected, though spirometer readings showed reduction in the tidal air from 750 c.cm. per respiration in a control period to 500 c.cm., with no alteration in rate. There was a rise of blood-pressure from 130/80 mm. to 145/85 mm. Hg, and a rise in pulse-rate from 72 to 86 per min., but this may have been of emotional origin. Within *fifteen minutes power started to return to the muscles in* the reverse order to that in which paresis had developed. Muscle power was regained within twenty-five minutes, although ptosis, diplopia, vertigo, and slight ataxia due to the diplopia persisted for three or four hours.

A dose of 30 *mg. given intravenously* next produced, within two minutes, complete paralysis of the muscles of the face, neck, limbs, and abdomen, and the subject was unable to open the eyes, move, speak, cough, or swallow. Within three minutes the intercostals were paralysed, and breathing became rapid and shallow. *Spirometer measurements* (*see accompanying figure*) with the subject breathing pure oxygen then recorded 25 respirations per min. (control 11 per min.) and a tidal air of only 160 c.cm. (control 750 c.cm.). For the next *two minutes respiration* became more and more difficult, and the feelings of the subject can only be described as terrifying. To be conscious yet paralysed and unable to breathe is a very unpleasant experience. At the end of five minutes the respirations, or rather gasps, were 50 per min, and the tidal air only 115 c.cm., which, with the dead-space air in the body and the apparatus, was totally inadequate to maintain respiratory exchange. The resultant asphyxia was masked by the fact that the subject was breathing pure oxygen. Though there was no apparent anoxæmia, it is probable that carbon dioxide was accumulating rapidly. At this point the subject was just beginning to lose consciousness, and the larynx and pharynx were clogged with mucus. Artificial respiration was then applied by manual compression of the breathing bag and prostigmin 1·5 mg. injected intravenously. In this dose it was ineffective in antagonising the effect of 30 mg. of *d*-tubocurarine chloride. Seven minutes' artificial respiration was sufficient to restore respiration to normal. Muscular power returned in thirty to forty minutes; diplopia and ptosis persisted for just over four hours. Six hours later the subject felt perfectly normal. A tight feeling across the chest persisted for several days. During the test the blood-pressure rose from 130/80 mm. to 200/140 mm. Hg in five minutes, and the pulse-rate increased considerably. These effects were attributed largely to fear and asphyxia rather than to a direct effect of the *d*-tubocurarine chloride on the cardiovascular system, because the blood-pressure returned to normal in ten minutes. Electrocardiograms taken before the administration of the drug and three minutes and ten minutes after its administration showed no abnormality. No undesirable after-effects were observed.

No analgesic action was observed with a dose of 30 mg. of *d*-tubocurarine chloride. Strips of adhesive plaster torn from a hairy part of the body still produced considerable pain. Whitacre and Fisher (1945) state that 10–13·5 c.cm. of intocostrin (equivalent to 200–270 mg. of standard " curare " and, on our reckoning, to 60–80 mg. of *d*-tubocurarine chloride) produces sudden unconsciousness and apnœa, and that, if artificial respiration is instituted, blood-pressure, pulse, and circulation are not appreciably affected, and the patient still remains unconscious. They further state that, using a total dose of 405 mg. of curare (equivalent to 135 mg. of *d*-tubocurarine chloride) they performed abdominal operations, using no other anæsthetic agent. We consider, however, that no conscious patient should receive a dose of 30 mg. or more of *d*-tubocurarine chloride, or a dose that depresses respiration excessively and abolishes swallowing or coughing. The effects are far too unpleasant.

Fractional Doses.—Further tests were then made on the conscious subject to determine the method of administration of the drug likely to give the most prolonged degree of relaxation. The administration of fractional doses was tried first. 30 mg. of *d*-tubocurarine chloride was dissolved in 15 c.cm. of sterile distilled water and injected intravenously at the rate of 1 mg. per min.—i.e., thirty minutes was taken over the injection. This simulated the administration of the drug in a saline drip transfusion. There was a slow and progressive paralysis, but this was never complete except for the face muscles. The speech was slurred, though never lost, and at all times the arms could be moved, and slight movements could be made with the neck and legs. The abdomen was never relaxed completely, and breathing was not consciously affected; the vital capacity was, however, reduced from a normal of 5·5–6 litres to 3·5 litres. Within ten minutes of receiving the drug the subject could sit up, and within fifteen minutes recovery of muscular power was complete, although diplopia, vertigo, and slight ataxia persisted for three hours. The degree of paralysis, after 30 mg. of *d*-tubocurarine chloride had been administered fractionally in half an hour, was probably about the same as that produced by 15 mg. given at once intravenously. Since the paralysis was progressive, 1 mg. of the drug per min. might have produced sufficient relaxation if given for a longer period of, say, forty-five minutes. This would mean increasing the dose to 45 mg. We therefore decided that, owing to rapid destruction and elimination, the administration of a given dose by a drip transfusion was not the best way of giving it. This was borne out by observations on patients undergoing operation. An initial curarising dose of 20 mg. or 2 mg. per stone of body-weight (0·3 mg. per kg.) given in one injection intravenously, followed by a drip delivering 1 mg. of *d*-tubocurarine chloride per min., would be effective over a long period; but, in view of the present expensiveness and scarcity of the drug, this would be uneconomic.

Combined Intravenous and Intramuscular Injections.—A dose of 15 mg. of *d*-tubocurarine was injected intravenously, and then a similar dose intramuscularly. The effects produced were similar to those obtained with 20 mg. given intravenously in a single injection, but they lasted much longer—i.e., forty-five minutes compared with twenty-five minutes after a single intravenous injection of 20 mg. At no time was respiration consciously impaired; the tidal air averaged about 500 c.cm., which was also the figure recorded after a single intravenous injection of 20 mg.



Effect of intravenous injection of *d*-tubocurarine chloride 30 mg. on respiration of unanæsthetised subject.

It was therefore decided that the best method of administering *d*-tubocurarine chloride during surgical operations was to begin with an adequate curarising dose intravenously and to reinforce this with a further quantity given intramuscularly if the operation was likely to last for more than from forty to forty-five minutes. When supplemented by gas-and-oxygen anæsthesia the relaxing effect of an optimal dose of *d*-tubocurarine chloride is prolonged for approximately this period.

CLINICAL TRIALS

Clinical trials with *d*-tubocurarine chloride were undertaken (1) to determine the preliminary dose necessary to produce muscular relaxation sufficient for abdominal surgery, using 'Pentothal'-gas-oxygen second-plane anæsthesia; (2) to find what further amounts were needed to maintain relaxation for so long as the operation lasted; and (3) to compare patients who had had the drug with similar patients in whom relaxation had been obtained by other anæsthetic agents, and to observe any complications in using the drug either during operation or postoperatively. In all, 180 cases were observed. The operations in which *d*-tubocurarine chloride was used were as follows:

Abdominoperineal resection of rectum ..	1
Appendicectomy	14
Bronchoscopy and œsophagoscopy	13
Cholecystectomy and operations on biliary tract	23
Colon operations	11
Gastrectomy and operations on stomach ..	49
Gynæcological	30
Laparotomy	20
Prostatectomy	3
Ventral hernia	5
Miscellaneous	11
Total ..	180

DOSAGE AND TECHNIQUE

There appears to be an optimal dose of *d*-tubocurarine chloride. Less than this does not produce adequate abdominal relaxation, and very little more paralyses the diaphragm. This paralysis may be only partial, but it leads to depressed respiration and is, if possible, to be avoided. The limits are fine, especially in children, and they are influenced by the potency of the anæsthetic used.

The observations of Cullen (1943, 1944) were confirmed, and no more than one or two trials were made of *d*-tubocurarine chloride in combination with ether. Very small amounts of either are needed. The drawbacks of ether anæsthesia, however, remain: nausea, vomiting, depressed liver function, and prolonged postanæsthetic recovery. Several patients were anæsthetised with cyclopropane, but it became evident that a separate scale of dosage would probably be necessary for each anæsthetic; so it was decided to use pentothal-gas-oxygen, the anæsthetic combination least likely to upset the patient, using only the minimum of pentothal necessary to " stabilise " the anæsthesia. Methods in which anoxæmia is a part of the technique were not used. Pentothal is a potent respiratory depressant, and it is advisable to separate the injections of pentothal and *d*-tubocurarine chloride by at least ten minutes if respiratory depression is to be avoided; second doses of pentothal, sometimes necessary to deepen anæsthesia, lead to depression unless they are given very slowly. In two cases pentothal and *d*-tubocurarine chloride were administered in full dosage together. The result was respiratory depression needing artificial respiration for an hour in each case.

Premedication consisted of 'Omnopon' gr. $^1/_{80}$ (2·2 mg.) and scopolamine gr. $^1/_{1500}$ (0·044 mg.) per stone of body-weight. This allows for variations in body-weight, the 10-st. patient receiving omnopon gr. $^1/_3$ (22 mg.) and scopolamine gr. $^1/_{150}$ (0·44 mg.). All patients were intubated. Though we have never experienced bronchospasm or laryngospasm, which have been reported by earlier workers with curare, we felt that an endotracheal tube combined with a good fitting mask would give complete control of the respiration at all times. Patients for gastric section came to the theatre with a Ryle's tube in the stomach, so that the stomach could be sucked dry easily. This is of great practical value in preventing regurgitation of gastric contents through the paralysed cardia when the stomach is pressed on by the surgeon.

In all major cases an intravenous saline or plasma drip was set up. This enabled us to control any drop in blood-pressure and made the administration of further doses of pentothal or *d*-tubocurarine chloride easy to administer intravenously. In a gastrectomy, for example, an intravenous drip was set up before induction of anæsthesia, and pentothal (0·2–0·5 g.) was given by injecting it into the rubber tubing. Gas-and-oxygen was next administered, and blind intubation performed. The mask was adjusted so that it was gastight, and the patient was stabilised in second-plane anæsthesia, further small doses of pentothal being given if required. After anæsthesia had been proceeding smoothly and evenly for ten minutes, the calculated dose of *d*-tubocurarine chloride was injected into the tubing of the drip apparatus. This dose is best given all at once; attempts to gauge the dose by administering several small amounts at short intervals are not nearly so successful and lead to the patient's receiving much more of the drug than when it is administered in one dose.

An attempt was made to determine the dose necessary for abdominal surgery when the anæsthetic used was gas-and-oxygen with minimal doses of pentothal. In an average case we found that a dose of 2·5 mg. per stone of body-weight (0·4 mg. per kg.) given intravenously usually led to good relaxation without undue respiratory depression. In computing the weight it is, however, necessary to consider muscle mass and to discount that which is due solely to fat. In the very young, in the aged, and in cachectic and severely ill patients the dose was reduced to 2 mg. per stone of body-weight (0·3 mg. per kg.). The maximal single dose given to any patient was 30 mg.

Before receiving the *d*-tubocurarine chloride patients were stabilised in second-plane anæsthesia, and the breathing was consequently moderately deep. Less than a minute after the injection of the drug intravenously respiration became shallow and in some cases definitely depressed. It takes from three to five minutes for the drug to produce its maximal effect on the respiratory system, and the respiratory volume usually becomes progressively smaller up to this point. In a few cases, where either the depressant effect of pentothal still persisted or the dose of *d*-tubocurarine chloride was too great, respiration stopped altogether, and it was necessary to control the breathing by rhythmic manual compression of the bag in the anæsthetic circuit. This never gave any cause for alarm, as the respiratory depression is purely peripheral, not central, and only temporary.

In most cases the systolic blood-pressure rose about 10–15 mm. Hg shortly after injecting the drug. It was at first assumed that this was due to raised carbon-dioxide tension in the pulmonary alveoli, a direct consequence of the depressed respiration, but in several cases, in which the breathing was controlled and the patient hyperventilated from the beginning, this rise of blood-pressure still took place. This observation is contrary to the statements of most workers using intocostrin, who claim that the latter has no effect on blood-pressure.

The effect of the initial dose of *d*-tubocurarine chloride in relaxing the abdominal wall lasts about forty-five minutes and in some cases sixty minutes. In operations lasting longer than this we gave a second dose intramuscularly equal to half the original one. As an intramuscular injection usually takes about fifteen minute to act, we gave this intramuscular injection half an hou after the original. The effect of these two injection lasts from one and a half to two hours and is thu adequate in all but the longest operations, but occasionall in those which last about three hours it is necessary t give a further dose to enable the surgeon to close th abdomen easily. Sufficiently good relaxation withou respiratory depression may now be obtained by agai halving the dose—i.e., a quarter of the initial dose—and this time it is given intravenously to produce rapid effect.

Without being able to handle the abdominal wall it i not easy to judge the degree of relaxation or to determin when it is wearing off. We have not had the advantage o an electromyograph. An apparatus described by Henderson (1937) to measure intramuscular pressure wa constructed but was not found of great practical use We had therefore to depend on the surgeon or his assistan to tell us when the abdominal wall was regaining it tone. If the anæsthesia is allowed to lighten to to great a degree, the patient may move a limb or his head In the earlier stages the abdomen usually remain relaxed, but later, perhaps half an hour after the initia dose, too light anæsthesia may be associated wit tightening of the abdominal muscles. When the anæsthetic is deepened, the abdominal musculature agai relaxes. To some extent the relaxing actions of curare-like drugs and anæsthetics are similar; additiona anæsthetic may spare the drug, or a further dose o drug may enable one to use a weaker anæsthetic mixture It has been shown by Gross and Cullen (1945) that bot ether and pentothal have a curare-like action in th sense that they inhibit muscular contraction after th injection of acetylcholine.

SIGNS OF ANÆSTHESIA

The eye muscles are paralysed, and the respiration i often depressed—third-plane anæsthesia is in fac simulated in every respect—yet if the anæsthesia i allowed to lighten the patient may move. How the can one judge the depth of anæsthesia? Having anæsthetised and, so far as is practicable, stabilised the patien in the second plane, it is usually sufficient to keep hi on the same gas mixture throughout. Gas-and-oxyge is a weak anæsthetic; hence deeper planes are no easily obtainable except in the anæmic or shocked patient With normal patients, if sufficient oxygen is administere to keep the patient pink, deep anæsthesia is unlikely.

In those cases where satisfactory anæsthesia cannot, however, be maintained a further injection of pentotha becomes necessary. It must be given slowly and in minimal dose; otherwise severe depression of respiration will develop, and it will then become extremely difficult to judge the depth of anæsthesia.

With cyclopropane it is perhaps more difficult to judge the depth of anæsthesia, because deeper planes are so easily obtained. One must endeavour to carry on with the same percentage mixture as was originally found to have stabilised the patient in the first or early second plane.

COMPLICATIONS

During Operation.—Apart from temporary depression of respiration, difficulties or complications during the operation were surprisingly few. For abdominal work sufficient *d*-tubocurarine must be given to paralyse completely the intercostal muscles. The dose is a critical one, and with adequate abdominal relaxation it appears that partial paralysis of the diaphragm is always present from ten to fifteen minutes initially; it soon wears off and, beyond slight lessening of the tidal air, is not of any consequence. In 34 of our cases respiration was helped by compression of the rebreathing bag from five to ten minutes. In another 18, however, respiratory depression was severe and necessitated controlled respiration for fifteen minutes or longer. Patients in the Trendelenburg position often showed pronounced respiratory depression after being given *d*-tubocurarine chloride. This was attributed to the weight of the liver and abdominal viscera pressing against the partially paralysed diaphragm. Case and Stiles (1946), in studies on unanæsthetised subjects, have shown that, so far as interference with vital capacity is concerned, the Trendelenburg position is one of the most unfavourable ones for the patient. Care must therefore be exercised when giving curare preparations to patients in this position. In all cases of respiratory depression it is important for the anæsthetist to practise controlled respiration until the patient is again breathing fully. Another occasional complication is jerky movements of the diaphragm similar to those which sometimes arise in third-plane ether anæsthesia; in a few cases this has led to a definite hiccough.

Prostigmin was seldom used to counteract the effect of excessive doses of *d*-tubocurarine chloride. In doses of 1–2 mg., recommended by American authorities, it had no apparent effect in restoring respiration that had been severely depressed. One of us administered 5 mg. of prostigmin intravenously to a patient who had received 43 mg. of d-tubocurarine in forty minutes during a thoracic operation under controlled respiration. Respiration was depressed for three-quarters of an hour after the operation was finished, but within five minutes of injecting the prostigmin respiration had returned to normal. It thus seems that, if prostigmin is to be effective, doses of the order of 5 mg. or more must be used. Atropine gr. $^1/_{50}$ (1·3 mg.) should also be given, to balance the parasympathomimetic action of the prostigmin.

There was often a slight rise in the systolic blood-pressure after administration of *d*-tubocurarine chloride, not usually more than 15–20 mm. Hg, and this may be the cause of a tendency to increased bleeding noted in 12% of the operations. We have, however, never been quite convinced of its reality. Unless used in doses to depress respiration severely, *d*-tubocurarine chloride has little effect on the pulse-rate.

The gut during operation is contracted, as with a spinal anæsthetic. It appears to be more irritable than normal, and peristalsis is easily produced. In the experimental animal *d*-tubocurarine chloride is, however, stated to cause relaxation of the gut (Gross and Cullen 1945).

It is remarkable that, though our patients were always very lightly anæsthetised, they appeared to suffer no shock whatever and often left the operating-theatre as fit after a three-hour abdominal operation as when they entered it. As a rule reflexes began to return before the patient left the table, and consciousness returned shortly after the patient reached the ward. This was appreciated by the nurses, whose bedside vigil, waiting for the patient to recover consciousness, was considerably shortened.

After Operation.—Postoperative complications have been surprisingly few in this series compared with those obtained by other anæsthetic techniques. Ileus developed in 4 of our cases, but it is impossible to say whether it was due to the drug. All the gastric patients had a Ryle's tube inserted; and, because of this, acute dilatation of the stomach was seldom seen. Chest complications were the most numerous, but they were no more frequent than with other anæsthetics; all the patients were operated on during the winter months. There have been 2 burst abdominal wounds which have required resuture. It was suggested that the failure to heal was due to hæmatomata caused by increased bleeding, but none of the patients concerned was noted to have bled unduly at the operation.

COMPARISON WITH OTHER ANÆSTHETIC TECHNIQUES

We have compared the results obtained with second-plane gas-and-oxygen anæsthesia, using *d*-tubocurarine chloride as a muscle relaxant, with those of other anæsthetic techniques. During the operation the relaxation obtained with *d*-tubocurarine chloride is just as good as that produced by spinal anæsthesia, only it does not last so long. Using our technique of repeated and carefully timed injections we have rarely had complaints from the surgeon that the patient was becoming "tight." Should this happen, a further injection produces relaxation in a minute or so. The drawbacks of spinal anæsthesia—fall of blood-pressure, contra-indication in shock, risk of infection and neurological sequelæ, postoperative headache, and the occasional difficulty of performing lumbar puncture—were never experienced. Of inhalation anæsthetics, gas alone does not produce satisfactory relaxation; ether produces relaxation but leads to prolonged postanæsthetic recovery, vomiting, and depression of liver function. When cyclopropane is used, complete muscular relaxation can only be produced by controlled respiration, and then bradycardia and arrhythmias may develop. Nerve blocks usually produce satisfactory relaxation, but are time-consuming. Protracted intravenous barbiturate anæsthesia is hazardous in poor-risk patients, depressing both respiration and liver function.

POSTOPERATIVE COMPLICATIONS

Anæsthetic	Vomiting	Headache	Respiratory	Hiccough	Burst wound	Retention of urine	Ileus and dilatation of stomach
	Per cent.						
D-tubocurarine chloride and gas-and-oxygen	6	1	20	1	1·2	0	3
Inhalation ..	33	3	23	0	0	5	3
Spinal	30	12	33	8	2	9	9

We have compared the postoperative complications after using *d*-tubocurarine chloride with those arising after 180 similar operations in which spinal anæsthesia was used, and after 180 operations done with inhalation anæsthetics (mainly gas-oxygen-ether or cyclopropane). The accompanying table shows that there was considerably less vomiting after light anæsthesia supplemented with *d*-tubocurarine chloride. The incidence of pulmonary complications was not significantly less than after general inhalation anæsthesia, but it was less than that after spinal anæsthesia. In comparison with spinal anæsthesia the relative absence of headache, retention of urine, and complications affecting the stomach and gut is also noteworthy. The total incidence of postoperative complications in the *d*-tubocurarine chloride series was certainly less than in the others.

SUMMARY

D-tubocurarine chloride has been used to procure muscular relaxation in abdominal operations.

Preliminary observations were made on the unanæsthetised subject to find the safe dose and the most suitable method of administering the drug.

Perfect relaxation for abdominal operations was obtained by administering a dose of 2–2·5 mg. intravenously per stone of body-weight after the patient had been stabilised with pentothal and gas-and-oxygen in second-plane anæsthesia. The dose is a critical one and, if not carefully selected, may lead to respiratory depression.

This dose suffices for operations lasting from three-quarters of an hour to an hour. If relaxation is desired for more than this period, a second injection, half the first, is given intramuscularly half an hour after the first injection. The two injections produce relaxation lasting from one and a half to two hours; and, if relaxation is required for a period longer than this, further intravenous injections, a quarter the initial dose, can be given from time to time.

The chief complication experienced was respiratory depression or even arrest. Owing to the rapid elimination of the drug this effect was only temporary and was not considered serious. It was readily combated by controlled respiration.

Special care is needed when giving the drug to patients in the Trendelenburg position.

Apart from respiratory depression, complications and difficulties during operation were few. Postoperative complications were less than after spinal and general inhalation anæsthesia.

The chief advantages of *d*-tubocurarine chloride as an adjunct to anæsthesia are the ease of administration, the profound relaxation, the freedom from shock, the rapid postanæsthetic recovery, and the low incidence of postoperative complications.

We are indebted to the anæsthetic staffs of the Royal Free Hospital and Charing Cross Hospital for their help in the clinical part of this work.

REFERENCES

Case, E. H., Stiles, J. A. (1946) *Anesthesiology*, 7, 29.
Council on Pharmacy and Chemistry (1945) *J. Amer. med. Ass.* 129, 517.
Cullen, S. C. (1943) *Surgery*, **14**, 261.
— (1944) *Anesthesiology*, 5, 166.
Gray, T. C., Halton, J. (1946) *Proc. R. Soc. Med.* 39, 400.
Griffith, H. R. (1944) *Canad. med. Ass. J.* 50, 144.
— (1945) *J. Amer. med. Ass.* 127, 642.
— Johnson, G. E. (1942) *Anesthesiology*, 3, 418.
Gross, E. G., Cullen, S. C. (1945) *Ibid*, 6, 231.
Henderson, Y. (1937) *Anesth. & Analges.* 16, 43.
King, H. (1935) *J. chem. Soc.* ii, 1381.
Mautner, H., Luisada, A. (1941) *J. Pharmacol.* 72, 380.
Whitacre, R. J., Fisher, A. J. (1945) *Anesthesiology*, 6, 124.

"MASKED" SYPHILIS

DANGERS OF PENICILLIN THERAPY

E. Cronin
M.D. Camb., M.R.C.P.

The increasing use of routine penicillin therapy is apt to mask early syphilis presenting in unusual forms. This real and important danger should be thoroughly appreciated by all, both general practitioners and specialists, undertaking penicillin therapy. It is of especial importance in the immediate post-war period.

Except organic arsenic, no other chemotherapeutic drug used before the introduction of penicillin in the treatment of non-specific diseases has either hindered the evolution or delayed the progress of syphilis presenting in the guise of some other condition. Organic arsenic is so little used in this country for general diseases that it has not created any difficulty. Penicillin in adequate dosage may cure syphilis, but in too small dosage may hasten its involution and hinder or prevent its later diagnosis.

ILLUSTRATIVE CASES

Case 1.—A private was admitted to the medical division of a hospital with the diagnosis of tonsillitis. Temperature 101° F, pulse-rate 96. Right tonsil enlarged and purulent, with tender enlarged right tonsillar glands. Throat swab: no Klebs-Löffler bacilli; a few hæmolytic streptococci.

Treated with sulphathiazole for five days. Temperature 99·4° F. No improvement in throat condition. Intramuscular penicillin injections were then given. Condition worsened first day, with rise in temperature to 101·4° F, and increased swelling and tenderness in throat and neck; then improved on continuation of treatment.

A rash on the arms had been noted two days after admission to hospital (? sulphonamide rash). On examination a week later he had a well-defined maculopapular syphilide over the shoulders, sides of thorax, and limbs, and a papular eruption on the soles. The lesions showed signs of involution after 450,000 units of penicillin. The tonsillar inflammation had subsided, leaving a hard non-tender discrete gland in the right tonsillar region.

Patient said that he woke up, an hour before the third injection of penicillin (five hours after the start of this treatment), shaking and shivering, and with his throat and neck more painful and swollen. The shivering was followed by sweating, and the rash on his arms "stood out like fire." This was, in fact, a typical Herxheimer reaction of secondary syphilis, the rise in temperature twelve hours later to 101·4° F being the associated pyrexial reaction. Had the temperature been taken in the intervening twelve hours, it would have undoubtedly been higher.

His Kahn test was positive, + + + + (80 K.U.), and his rash resolved on routine penicillin therapy, all dark-field examinations being negative.

Case 2.—A signaller reported sick with weeping areas on the scrotum and penis. He had had previous attacks of "seborrhœic dermatitis." Treated with calamine lotion, lotio d'Alibour, and then penicillin cream. After twelve days on this last treatment the condition had improved, but ulcers on the penis were found, and he was referred for further investigation and diagnosis.

On examination he had a large indurated circum-meatal ulcer of the penis, with several smaller ulcers on the scrotum, and bilateral inguinal adenitis, with discrete non-tender glands. Nothing else abnormal was found.

Eighteen dark-field examinations of the ulcers and five gland punctures in two weeks were negative. Three blood tests were also negative. A sixth gland puncture sixteen days after admission was positive for *Treponema pallida*, and the Kahn test on the same day was positive, + +.

On penicillin therapy he had a pyrexial Herxheimer reaction of 101·6° F, and all lesions healed rapidly.

Case 3.—A corporal reported sick with eight weeks' history of a "boil" on the left cheek, which had been treated by fomentations and tablets while in England. An ulcer remained which did not heal until penicillin cream was applied, three weeks before he was referred for an opinion.

On examination he had a healed ulcer on the left angle of the jaw, with an indurated raised scar, and a hard discrete non-tender submental gland. In a good light a faint macular eruption of the trunk and limbs was visible.

A gland puncture was negative, but on dark-field examination of the edge of the ulcer, after scraping, two spirochætes resembling *T. pallida* but only slightly motile were seen. Blood test was positive, + + + +. On treatment he developed a macular flare in the rash and a pyrexial reaction of 101° F.

Case 4.—A gunner had "balanitis and eczema of the scrotum" for ten days, for which he had received penicillin cream. On examination he had healing abrasions of the frenal angle, but no inguinal adenitis or other physical signs. Dark-field examinations negative. Repeated blood test positive, + + + +. A Herxheimer reaction developed when penicillin therapy was begun.

Case 5.—A corporal with paronychia had had the nail of his left little finger incised. No healing took place on routine local treatment and sulphathiazole by mouth. After three weeks he was put on penicillin cream. The ulcer began to heal. Routine Kahn test six weeks after admission was positive, + +.

On examination he had a healing ulcer on the site of the paronychia, healing secondary papules on the scrotum, and a faint maculopapular rash on the trunk. Dark-field examinations of the ulcer on the finger were negative, but

T. pallida was found in one of the scrotal lesions. Kahn test positive, +.

On penicillin therapy he developed a flare in his rash and a pyrexial reaction of 102° F.

CASE 6.—A gunner reported with three weeks' history of an ulcer of the lower lip, with swelling, first on the left side, and then on the right side of jaw. He was treated with mouth-washes and then with penicillin pastilles—about 60–80 in all—of unknown strength.

On examination he had a large ulcerated split papule at the left angle of the mouth and a mucous patch of the upper right alveolar margin, with discrete bilateral submental adenitis. Ten dark-field examinations of the ulcers were negative, but on the fourth gland puncture slightly motile spirochætes resembling *T. pallida* were seen. Kahn test repeated positive, ++++. A well-marked macular eruption of the skin, with an associated temperature of 100·8° F, developed when penicillin treatment was begun.

CASE 7.—A trooper had reported sick five weeks earlier with infection of the index finger of the right hand. After incision a slow-healing ulcer formed, which did not respond to sulphonamides and other measures. Penicillin injections were given. Patient noted a vivid rash on the body the first day of his injections but was told it was a "sensitivity" rash. A blood test taken was positive, ++.

On examination, after 570,000 units of penicillin, there was an involuting maculopapular eruption on the trunk and limbs, with papules on palms and soles, generalised adenopathy, and a large healing ulcer of the right index finger, with swelling and cyanosis extending up to the palm.

All dark-field examinations from ulcer, secondary lesions, and gland punctures were negative. Kahn test positive, +++. Treatment was completed with penicillin. No further Herxheimer reaction was observed, the secondary rash involuted completely, and the ulcer of the finger healed rapidly.

DISCUSSION

The cases cited illustrate the difficulties in the diagnosis of syphilis caused by any form of penicillin medication. When syphilis presents in an unusual form, signs and symptoms which might enable a diagnosis to be made are easily overlooked by a doctor not specially trained in the subject. If, combined with this, it is realised that the "index of suspicion" for syphilis is still low among doctors, we may well face the prospect of cases of syphilis being missed in the early stages, with consequences that can easily be imagined.

The non-recognition of syphilis in very much larger numbers of civilians is to be expected, unless certain precautions are taken. It would be easy to require a dark-field examination of any lesion in a patient about to receive penicillin therapy, but this is impracticable and would be resented by both doctor and patient. The following points, however, would certainly minimise any danger of masking syphilis through penicillin medication:

(1) Unless the diagnosis is definite and certain, and possibly even then, a routine Kahn test should be done before treatment.

(2) If penicillin is to be given in any form the patient's entire body should be carefully examined. If any skin eruption exists the case should be seen by a dermatologist before being diagnosed as sulphonamide rash, toxic erythema, &c.

(3) When parenteral penicillin is given, a three-hourly temperature chart should be kept for the first twelve hours of administration. Any rise in temperature, aggravation of symptoms, or appearance or accentuation of a rash should arouse suspicion of a Herxheimer reaction and call for a careful review of the case. Since a Herxheimer reaction very often follows the penicillin treatment of syphilis, this is of definite value.

SUMMARY

Cases of syphilis not immediately recognised, and treated by penicillin medication, are described.

The difficulties in diagnosis thus created are discussed, and suggestions made which would tend to minimise them.

PRESERVATION OF THE VEIN IN OPERATIONS FOR ARTERIOVENOUS FISTULA

JOHN HAILE
M.B. Lond.

From the Vascular Centre, Hill End E.M.S. Hospital

THE danger of ischæmia in the distal part of a limb after ligature of its main artery is well recognised, but due warning against ligating a main vein has not been given, and the bad effects of such a ligature have not been emphasised. That bad effects may follow, particularly in the lower limb, is shown by the following representative cases out of a considerable number in which a similar clinical picture has been seen.

CASE 1 (*ligature of the profunda femoris artery and of the femoral and profunda veins*).—A guardsman was injured in the right groin by a fragment from a land mine. Five months later the signs of an arteriovenous fistula were found in his right femoral region. Ten months later still, in an operation to cure the fistula, the profunda femoris artery was ligated and a part of the femoral vein excised, including a piece of the tributary profunda vein (fig. 1).

There was much venous congestion in the affected limb after the operation, and ten months later the patient still had pain in the leg at the end of the day, and swelling of the ankle.

CASE 2 (*ligature of the popliteal vein*).—A private soldier, aged 29, was wounded by a rifle bullet behind the right knee. Six weeks later, at a convalescent depot, an arteriovenous lesion was found.

On examination soon after this he had the signs characteristic of an arteriovenous fistula in the right popliteal region, but there was no evidence of ischæmia or venous engorgement in the leg or foot. After lumbar ganglionectomy, however, dilated veins were noted in the leg on standing.

The fistula was cured by ligating the popliteal vein, excising about 1 in. of it, and tying the communication without damaging the artery (fig. 2). Pulses at the ankle were never lost.

When the patient got up after operation, the symptoms and signs of occlusion of the vein became obvious and were his only disability.

CASE 3 (*ligature of the femoral artery and vein*).—A lieutenant, aged 21, was wounded by a rifle bullet in the lower part of the right thigh. There was "spurting" bleeding for a short while, and the leg and foot soon began to go stiff and cold. Ten hours later the artery and vein were found to be damaged in the subsartorial canal, and they were both ligated. The leg soon became warmer and at the end of two weeks was painless. After five weeks the patient was allowed to get up and, on lowering his leg, he immediately noted his foot go purple, and it became very painful. The pain and the local physical signs were characteristic of venous obstruction.

Because he had a cold foot and an ischæmic nerve palsy, which was recovering very slowly, lumbar ganglionectomy was done; and, although the pulses soon returned at the ankle, the symptoms of venous obstruction were aggravated for about two weeks.

Further analysis shows that these symptoms and signs of venous obstruction are surprisingly constant, and they will now be described in full.

SYMPTOMS AND SIGNS OF VENOUS OBSTRUCTION IN THE LEG

The most marked symptom is pain, which is described as a "dull ache," "severe pins-and-needles," or a "bursting feeling." It is felt round the ankle or on the dorsum of the foot. It is produced by lowering the leg and is worse on standing than on simply putting the leg to the ground when in a sitting position. However, pain may become intolerable after sitting in one position for an hour or so. The pain is also brought on by heat of any sort; so it may come on in bed at night, and be particularly severe and persistent after an evening hot bath. When it has been brought on by lowering the limb, the

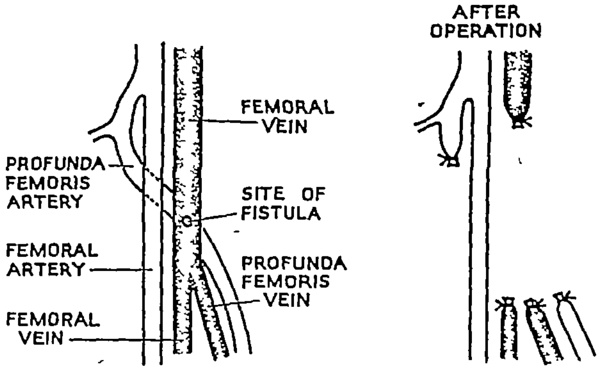


Fig. 1—Arteriovenous fistula between profunda femoris artery and femoral vein (case 1) treated by ligation of the artery and excision of a part of the femoral and profunda femoris veins. (Figs. 1-4 are diagrammatic and not drawn to scale.)

pain is rapidly relieved by raising it again above "heart level." When the pain is produced by heat, the relief on raising the limb is a much slower process but may be accelerated by cold applications. The pain is relieved by walking a few steps, and this differentiates it clearly from intermittent claudication. The onset of the pain is delayed and may be prevented by a firm bandage applied from the base of the toes to the lower thigh.

The onset of the pain can be delayed by pressure over the main artery or by the application of a blood-pressure cuff inflated sufficiently to occlude the artery. Similarly the pain can be brought on in the horizontal position by a cuff applied at a pressure a little lower than that required to stop the distal pulse.

Another symptom is swelling round the ankle. This comes on in all cases when the patient first gets out of bed and is worse with longer periods of standing. It can be greatly reduced by bandaging but may persist for a very long time—at least for many months after operation.

On examination the most striking features are the rapid onset of cyanosis on lowering the limb and the prominence of the surface veins round the ankle and over the dorsum of the foot. There will often be pitting œdema round the ankle, especially if the condition has not been recognised and treated.

EFFECT OF SYMPATHECTOMY

The fact that the superficial veins in a limb are dilated after sympathectomy has already been described by White and Smithwick,[1] who attribute this to increased blood-supply and to "release from the vasoconstrictor centre."

On several occasions we have noted that the symptoms of venous congestion have been exaggerated by sympathectomy, particularly so when the arterial supply is good compared with the venous return. This is illustrated by the following case, in which the lesion was similar to that in case 2, but the final disability was less.

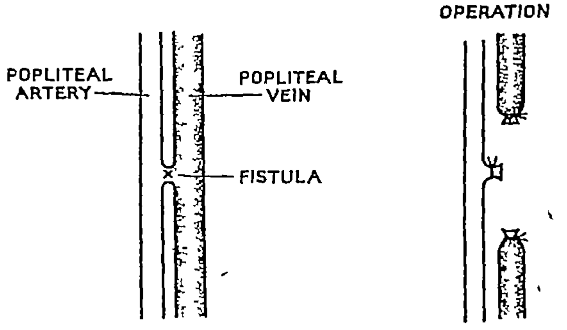


Fig. 2—Arteriovenous fistula between popliteal artery and popliteal vein (case 2) treated by excision of part of vein and ligation of communication.

CASE 4 (*ligature of popliteal artery and vein*).—A lance corporal, aged 25, was wounded by a mortar-shell fragment behind the right knee. There was a lot of bleeding and gross swelling of the ankle and foot, which persisted three weeks. Thirteen days after wounding, a piece of metal was removed from the popliteal fossa and the wound was closed. Two months later the patient was walking without sticks, and a week after this he was doing full physical training, although he noticed some throbbing at the back of his knee and some pain on walking about a mile.

Nearly three months later, at a convalescent depot a vascular lesion was noted. On examination soon after this there were the signs of an arteriovenous fistula in the right popliteal fossa, with an aneurysmal swelling on the lateral side also. There was no evidence of circulatory disorder in the foot. A lumbar ganglionectomy was done, which produced some venous dilatation.

When the lesion was explored seven months after wounding, it was not possible to preserve the artery because of the wide neck of the aneurysm sac, and so 1 in. of the artery and vein was excised (fig. 3). When the patient began to walk about again after the operation, the signs and symptoms characteristic of venous congestion were inconspicuous.

DISCUSSION

The recognition of these facts becomes of the greatest importance in the operative procedure for the treatment of arteriovenous fistulæ. Previously the vein has been sacrificed light-heartedly, and on good authority, as a step in the operation either of quadruple ligature or of obliteration of the fistula by ligature or suture of the hole in the artery, access being gained through the vein. It is now realised that this procedure is liable to produce considerable and lasting disability, particularly (paradoxically) when the greatest efforts have been made to preserve the main artery intact.

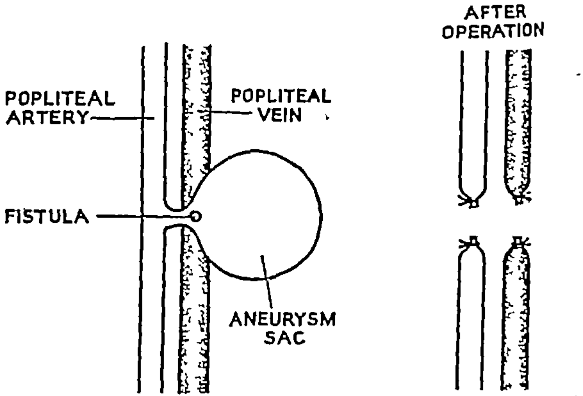


Fig. 3—Arteriovenous fistula between popliteal artery and popliteal vein with formation of aneurysm (case 4) treated by excision of about 1 in. of artery and vein.

An arteriovenous fistula produces so rich an arterial collateral circulation that the sacrifice of the artery at the site of the fistula is well tolerated. Strange though it may seem, in our experience quadruple ligation has been followed by less disability in the leg than has ligation of the vein with preservation of the artery. But the importance of tying the companion vein in *acute* arterial injury blinded us for long to the possibility of preserving the vein intact in long-standing cases, but making absolutely certain of dividing all the arteries communicating with it at the site of the fistula. This was tried in the following case which corresponds closely with case 1.

CASE 5 (*ligature of the profunda femoris artery with preservation of the femoral artery and the femoral and profunda veins*).—A major, aged 32, was wounded by a rifle bullet in the left

---

1. White, J. C., Smithwick, R. H. The Autonomic Nervous System, New York, 1941, p. 83.

roin. There was some bleeding, which was controlled by a ield dressing. He was helped back to a stretcher. The leg 'elt cold, and there was some numbness on the medial side but no paralysis. Three days later the exit wound in the buttock was excised and sutured. Thirteen days after wounding a vascular injury was found. He was soon allowed up and could walk without disability.

On examination four and a half months after injury he had the signs of an arteriovenous fistula in the left femoral triangle without vascular abnormality in the leg or foot. After lumbar ganglionectomy the veins in the limb became more obvious.

When explored, five months after wounding, the lesion was found to be a communication between the profunda femoris artery and the femoral vein proximal to the junction of the profunda vein. The femoral artery was found intact and preserved. The site of the fistula was determined as the point where local pressure over the vein completely stopped the thrill, and the veins were dissected towards this point. The profunda femoris artery was isolated above and below the communication and then clamped, divided, and ligated at these two points. There was still feeble pulsation in the vein, and this was found to be coming by retrograde flow through a small perforating artery passing backwards through the adductor muscles. This was clamped, divided, and ligated (fig. 4). The absence of visible pulsation in the vein was now confirmed by palpation and auscultation, and the wound was closed.

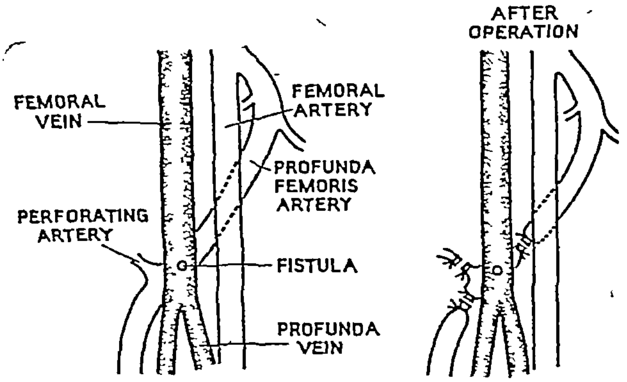


Fig. 4—Arteriovenous fistula between profunda femoris artery and femoral vein (case 5) treated by section and ligation of the artery above and below the fistula and of a perforating artery originating from the profunda femoris artery between these two points.

The absence of dilated veins in the leg and foot while still in bed was in well-marked contrast with the previous cases. On getting up there was slight prominence of the veins compared with the other side but probably not more than was previously noted after ganglionectomy. There were no symptoms or signs of venous obstruction. Peripheral pulses were all present, and the nutrition of the leg was perfect.

This method of tying all the arteries as close to the communication as possible has also been used with advantage for a fistula between the superficial femoral artery and vein. The procedure is obviously of greatest value when more than one artery or vein is involved in a situation where a tourniquet cannot be used. In such circumstances it is very difficult to control bloodflow by temporary ligature to repair vessels by suture. It might be useful also where the fistula is very difficult to isolate for anatomical reasons.

The results in the few cases in which this method has been adopted seem to justify further trial in circumstances under which quadruple ligature would formerly have been considered the correct treatment.

SUMMARY

The effects of venous obstruction after operation for arteriovenous fistula in the leg are described.

The signs and symptoms are analysed, and the influence of sympathectomy on them is mentioned.

The importance of the patency of the artery involved is discussed; and it is suggested that ligature of the artery with preservation of the vein may be undertaken with safety and with advantage to the circulation in the limb.

I wish to express my gratitude to Prof. J. Paterson Ross for his criticism and advice in the preparation of this article, and to Sir Claude Frankau for permission to publish it.

OIL STERILISATION OF SYRINGES

K. B. Rogers
M.B. Lond., M.R.C.S.
PATHOLOGIST, AREA LABORATORY, SHOTLEY BRIDGE EMERGENCY HOSPITAL

Recognition of the possibility that infective hepatitis may be transmitted through non-sterile instruments used for injection has in recent years underlined the need for scrupulous sterilisation of syringes and needles, but this practice is still not universally observed. The use of all-glass syringes, advocated by the Medical Research Council committee, will need equipment which will be lacking for some time. In busy departments there is neither time nor apparatus to allow of even 10 minutes' boiling before each injection or venesection.

Sterilisation by hot oil, long advocated by Wright and Colebrook,[1] is a method which by its speed and efficacy merits wider adoption. Its efficiency is evident from the following tests.

(1) Broth cultures of *Staphylococcus aureus*, *Staph. pyogenes*, and *Bact. coli communis* were aspirated into syringes. The contaminated syringes were filled without pause 1–4 times with oil at 120°–140° C. Three fillings rendered the syringes sterile at all temperatures.

(2) An emulsion of a Lowenstein Jensen culture of *B. tuberculosis* was first aspirated into syringes. When oil at 120°–140° C was aspirated and expelled without pause the results were irregular. Sterilisation was achieved by 3–4 fillings of oil with a second's pause when the syringe was full. Guineapigs inoculated with subsequent washings from these syringes showed no evidence of tuberculosis when killed 2 months later. Control guineapigs developed generalised tuberculosis.

(3) Syringes which had contained oxalated blood infected with *Staph. aureus* and *Staph. pyogenes* were completely sterilised if, without previous washing, they were filled 1–4 times (with or without pause) with oil at 130° C.

(4) Blood containing *Staph. aureus* was dried on syringe barrels and pistons. These were completely sterilised by 2 minutes' immersion in oil at 120° C.

(5) Blood containing spores of *B. subtilis* was dried in syringes; exposures of up to 12 minutes in oil at 120° C failed to kill the spores.

SUGGESTED PROCEDURE

As soon as the syringe has been emptied of blood it should be rinsed in water. Thus no blood is left in the syringe, which is not allowed to dry. Used syringes are returned to the laboratory, where the needle is removed and the syringe filled 3–4 times, with perhaps a second's pause at each filling, with liquid paraffin at 130°–135° C. The needle is then replaced on the empty syringe, and the oil again sucked in and expelled. The sterile syringe is kept in a test-tube, where it is held in place by a folded strip of adhesive plaster. Samples of blood for all counting, chemical, and bacteriological work can be taken with these syringes.

DISCUSSION

The principal advantage of this method is its speed, and there is no risk of hæmolysis. Thermostatically controlled oil baths are marketed, but an improvised metal container serves well in ward or consulting-room. A thermometer registering up to 200° C should, for choice, be used, but in an emergency Wright's bread-crumb method may be employed. The heat of the oil should not exceed 150° C because beyond this temperature the cement holding the glass to the metal components of the syringe may melt. Sometimes, especially with larger syringes, the piston may jam after aspiration of the oil, owing to the glass cooling and contracting more rapidly than the metal plunger; but the piston moves freely again within 5 minutes.

---

[1] Wright, A. E., Colebrook, L. Technique of the Teat and Capillary Glass Tube, London, 1921, p. 366.

Syringes submitted to this treatment are, of course, not sterile on the outside, and are therefore unsuitable for use in the operating-theatre, but they are satisfactory for ordinary injections or aspirations. Spores contained in dried blood are not killed by oil sterilisation, but with the technique described they are not likely to be encountered in ordinary injection or intravenous work. It remains to be determined whether the method will kill the virus of hepatitis.

I should like to thank Dr. E. T. C. Spooner for the Corstin strain of *Staph. aureus* and Dr. A. J. Messer for undertaking the guineapig inoculations. It should be emphasised that the technique described is not original, and has for many years been in use by others.

TUBERCULOUS GLANDS AND SINUSES
TREATED WITH CALCIFEROL

H. J. Wallace
M.D. Camb., M.R.C.P.
REGISTRAR, SKIN DEPARTMENT, ST. THOMAS'S HOSPITAL

This note is to record some interim observations on the treatment of tuberculous adenitis and sinuses from tuberculous abscesses with calciferol in high dosage. The treatment was tried because of the results obtained by Charpy[1] and Dowling et al.[2] in lupus vulgaris.

Case 1.—A girl, aged 8 years, had an enlarged cervical gland about $1^{1}/_{2}$ inches in diameter in the left side of her neck, first noted in November, 1945. A fortnight later a cold abscess appeared, which improved temporarily after aspiration. The fluid removed was macroscopically characteristic of tuberculous pus, and on culture tubercle bacilli were grown. The Mantoux reaction was negative in a dilution of 1/10,000 and positive in a dilution of 1/1000. There was no clinical or radiological evidence of tuberculosis elsewhere, and no relevant past or family history. The abscess cavity refilled some two or three weeks after aspiration and ruptured through the skin, leaving a discharging sinus. The skin round the sinus became excoriated, but there was no evidence of scrofuloderma.

Treatment with calciferol 50,000 units (one 'Ostelin High Potency' tablet) twice daily was begun at this stage, some six weeks after the enlarged gland had first been noted. Both the discharge from the sinus and the associated dermatitis settled within three weeks from the beginning of treatment. At the end of two months' treatment the enlarged gland had shrunk to about $^{1}/_{2}$ inch in diameter, though it had become considerably harder. The blood-calcium at this time was 11·2 mg. per 100 c.cm. Treatment was discontinued for a month, at the end of which the gland had become slightly bigger, but the sinus had remained healed. Calciferol was again given in similar dosage for a further two months, and the gland again underwent involution.

No treatment has been given for some six weeks, and there has been no evidence of the gland enlarging or of the healed sinus breaking down. Treatment produced no constitutional upset.

Case 2.—A girl, aged 17, had a cold abscess in the left side of the neck and an underlying tuberculous gland, first noted in September, 1945. The abscess was curetted at this time, but a small discharging sinus remained. Tubercle bacilli were grown from the pus. The Mantoux reaction was positive in a dilution of 1/10,000. There was no clinical or radiological evidence of tuberculosis elsewhere, and no relevant past or family history. In November, 1945, dermatitis developed round the opening of the sinus, together with one or two areas which were suspected of being scrofuloderma. Beyond rest, the only treatment that she had been receiving at this time was cod-liver oil and ultraviolet light. It was proposed to excise the underlying glandular mass, after the local dermatitis had settled.

At this stage treatment was begun with 50,000 units of calciferol twice daily. The discharge lessened almost immediately and ceased at the end of three weeks. The dermatitis settled some three weeks later, bland applications only having been applied. The areas that were thought to be scrofuloderma resolved after about two months' treatment, and at this time the underlying glandular mass had shrunk to half its original size. The blood-calcium after two months' treatment was 10·8 mg. per 100 c.cm. Treatment was continued at the same dosage for a further two months.

There was no constitutional upset as a result of treatment. For the past two months no treatment has been given, and there is no evidence of recurrence.

Case 3.—A boy, aged 8 years, had an enlarged gland in the right side of the neck, first seen in January, 1946, when tuberculous adenitis was diagnosed. A Mantoux reaction was positive in a dilution of 1/10,000. There was no clinical or radiological evidence of tuberculosis elsewhere, and no relevant past or family history.

Treatment was begun with 50,000 units of calciferol twice daily. No other treatment was given. The gland began to involute about six weeks after the beginning of treatment, and involution was complete at the end of three months' treatment.

Some constitutional upset, in the form of lassitude and nausea, was experienced at the beginning of treatment, but this passed off after three or four weeks. Blood-calcium at the end of two months' treatment was 11·2 mg. per 100 c.cm. Treatment was discontinued for six weeks, but the gland has so far shown no enlargement.

Case 4.—A boy, aged 17, had a cold abscess in the left side of the neck which had recurred several times within the past four years. Excision and curettage had given only temporary relief. He had also received cod-liver oil and ultraviolet light. There was an indefinite history of tuberculous peritonitis five years ago. In February, 1946, besides a discharging sinus in the line of the previous operation scar, an underlying gland about $1^{1}/_{2}$ inches in diameter was palpable. When this gland was squeezed pus could be expressed from the sinus.

Treatment with calciferol 50,000 units twice daily was begun and has continued for the past four months, with no real improvement either in the discharging sinus or in the underlying gland. The blood-calcium at the end of two months' treatment was 10·3 mg. per 100 c.cm. The Mantoux reaction was positive in a dilution of 1/1000. There was no constitutional upset as a result of treatment.

Case 5.—A soldier, aged 21, had a tuberculous abscess of the sternum for about four months, first noted in October, 1945. Tubercle bacilli had been cultured from the pus. There was no clinical or radiological evidence of tuberculosis elsewhere, and no relevant past or family history. The Mantoux reaction was positive in a dilution of 1/1000.

Treatment with calciferol 50,000 units twice daily was begun and continued for three months; it has been discontinued for the past month. The sinus healed after six weeks' treatment, and there has been no recurrence.

These observations suggest that calciferol in high dosage may be beneficial in the treatment of tuberculous conditions other than lupus vulgaris, for which it was originally used. None of these patients has been under observation long enough to justify a definite prognosis. It is clear, moreover, that not all cases of tuberculous adenitis are likely to respond to this treatment. It was thought possible that in case 4 the failure was due to inadequate drainage of pus, particularly in a patient who had a long-standing history of tuberculous adenitis and presumably a low resistance to the tubercle bacillus.

---

[1] Charpy, M. J. *Ann. Derm. Syph., Paris,* 1943, 3, 331; 1944, 4, 110, 331.
[2] Dowling, G. B., Thomas, E. W. P., Wallace, H. J. *Proc. R. Soc. Med.* 1946, 39, 225. Dowling, G. B., Thomas, E. W. P. *Lancet,* 1946, i, 919.

Dr. G. R. Osborn has been appointed honorary demonstrator in pathology at the University of Sheffield. Dr. Andrew Wilson has resigned from the lectureship in pharmacology, and Dr. J. H. Hale from the appointment of assistant bacteriologist.

Medical Societies

FACULTY OF RADIOLOGISTS

At the annual meeting held in Glasgow on June 28 and 29 a discussion on the

Sarcomas of Soft Tissues

was opened by Prof. C. F. W. **Illingworth**, who reported a series of cases treated at the Western Infirmary, Glasgow, over a considerable period. He included reticulosarcoma, lymphosarcoma, fibrosarcoma, myxosarcoma, myosarcoma, and other rare types. Except for the sarcomas of lymph-nodes, which are radiosensitive but dangerous because of the rapidity with which they grow and spread, the sarcomas are resistant to radiation and very difficult to treat by surgery. The w patients who survived for long periods had been eated by surgery and radiotherapy, but it was hard to e certain that the postoperative radiation made much ifference.

Prof. R. A. **Willis** said that the sarcomas of soft arts are among the most difficult of the tumours about hich pathologists are asked to give an opinion. Some f them are so undifferentiated that it is impossible ven to decide whether they are sarcomas or carcinomas. his is understandable if the development of the conective tissues from the primitive mesenchyme is rememered. Many of the fully differentiated cells are capable f tumour formation, and these tumours are easily iagnosed and described; but there are also mesenchymal ells necessary for normal growth and repair which retain he power of differentiating into several different kinds f cell. It is therefore not surprising that tumours of onnective tissue are found containing areas which appear on section to be entirely different and are described by a long string of names. Professor Willis thought that the name "mesenchymoma" should be used for these tumours. He illustrated his points by slides of sections in which a wrong diagnosis had been made, the true nature of the condition being apparent only post mortem.

Dr. **Waldron Smithers** believed that some improvement in the results of radiotherapy of malignant tumours might be obtained by more careful study of time and intensity. Dr. C. J. L. **Thurgar** described an investigation undertaken at Newcastle to discover whether heat derived from short-wave diathermy is a useful adjunct to radiotherapy. Some benefit, he thought, had been obtained.

Nuclear Physics and Medical Research

Prof. P. I. **Dee** sketched the technical advances of the last ten years—the cyclotron, betatron, and linear accelerators which give X rays at powers as high as 100 million volts, and neutron beams, and may shortly allow tests to be made with an electron beam for therapy. The transmutation of elements is now, he said, a commonplace reaction, and radioactive isotopes of any element can be obtained. The uranium pile can produce very large quantities of such therapeutic agents as radioactive phosphorus and cobalt, so research is no longer limited by the small amounts previously obtainable from early experiments with alpha particles and the beam from the cyclotron.

Prof. A. S. **Macfarlane** summarised the work done in the U.S.A. and Sweden using radioactive isotopes as tracers. Radioactive sodium chloride has been used to determine the rate of diffusion by the blood-stream and to measure the lymph volume of particular organs. Iron serves to determine unit volume of the blood and thus to investigate surgical shock. It has two isotopes with different properties which can be picked out by special measuring instruments, and this fact has been used to determine the relative survival in the blood-stream of stored and fresh blood. Also a mechanism has been demonstrated by which iron from hæmolysed blood is taken up by the new cells in preference to that supplied from without, even if given in large quantities. Hevesy, whose work in this field is already famous, has shown, working with the nucleated red cells of avian blood, that their survival-time is exactly 28 days, and he has also used radioactive phosphorus to investigate growth both of normal and of tumour cells. This kind of biochemistry may be described as dynamic, and shows to what an astonishing extent the chemical substances in all tissues are replaced during the life-span. In the space of ten years every molecule present in the living body of man will have been replaced by a new molecule synthesised within the framework of the living cells.

Dr. J. S. **Mitchell** also spoke of the importance of tracer research, particularly in the investigation of new growth. In therapy the use of radioactive phosphorus to treat leukæmia is well established, but the results so far are very similar to those of ordinary irradiation of the spleen. For other conditions isotopes of calcium, strontium, and iodine have been tried, but improvement has been obtained only occasionally.

TUBERCULOSIS ASSOCIATION

At a meeting in London on May 17, with Dr. **Norman Tattersall**, the president, in the chair, a paper on

Primary Pleurisy with Effusion

was read by Dr. **Brian Thompson**, who reported on 190 patients seen, between 1937 and 1944, in the urban industrial area served by the Ealing Chest Clinic. At the time of onset in each case evidence of parenchymal disease was either absent or limited to primary intrathoracic lesions. There was a high incidence of preceding or concurrent intrathoracic lesions typical of primary tuberculosis, sometimes confirmed by the later development of calcification. Cavity formation occurred in 5 patients with these lesions, which were not always on the same side as the effusion; but the incidence of both primary lesions and effusions was higher on the right.

Pleurisy with effusion was found predominantly in the years of late adolescence and young adult life. There was an excess of males over females in the 15–19 age-group.

The follow-up for the maximum periods of one to eight years revealed subsequent tuberculosis in 12% within the first year, in another 8% in the second year, and in a total of 25% within five years. In 15% of these patients the first evidence of disease was extrapulmonary. The death-rate for the 190 cases over the five-year period was 3·5%. Age was not related to the incidence of subsequent tuberculosis or its prognosis.

The condition was attributed by Dr. Thompson to infection of the pleural cavity from a subpleural focus or caseous glands, rather than to postprimary dissemination through the blood-stream. The former was supported by the absence of miliary lesions and by the tendency of both effusions and foci (when visible) to appear on the right side. A second effusion on the opposite side might be explained by lymph-node extension of infection across the mediastinum. Relatively few of the gross primary lesions underwent calcification.

There was a low incidence of known contact with tuberculosis, and the general picture was one of young persons escaping first infection in childhood, only to meet it suddenly, perhaps in a single massive dose, in the unaccustomed industrial or barrack life.

Pleurisy with effusion, he concluded, had probably become commoner under war-time conditions in England, reaching an incidence of one-tenth that of intrathoracic tuberculosis. In the absence of reinfectious disease or a non-tuberculous condition, the pleurisy was usually a manifestation of recent primary tuberculous infection. The condition occurred typically in young adults, who reacted differently to children; and the effusion was likely to follow first infection within six months. Phthisis, when it occurred, did so usually within the next year and almost always within two years. Though there was no evidence of any factor which influenced the march of events, it would be wise to continue the generally accepted lines of treatment, with careful radiological supervision for the five subsequent years.

Dr. W. R. **Richards** said that, of pleural effusions in children at High Wood Hospital, 24% were at ages 6–9, 34% at 10–15. In younger children they were associated with serious complications. In adolescents, cases of effusion sometimes slipped quickly into phthisis.

Replying to further speakers Dr. **Thompson** said that the two cases with calcification observed by him had been quite young, and he did not agree that it took time for a primary infection to die out. He thought that patients in sanatoria were not liable to superinfection there. He defended the use of the terms "reinfection" and "phthisis."

Morbidity of Tuberculosis

Mr. W. T. RUSSELL, D.SC., recalled the uninterrupted decline in the standardised death-rates between 1851 and 1916. Mortality increased during the first world war, but with the exception of a few oscillations in influenzal years the curve was chiefly downwards until 1939. Though it was possible that tuberculosis might have its waves of increment and decrement, the decline in recent times might have three causes: a more tuberculised population owing to increased urbanisation; increase of resistance through environmental factors; and better diagnosis and treatment. In the age-group 15–25 the death-rate of females did not decline between 1913 and 1933. Stocks had suggested that the failure of this age-group mortality to decline between 1926 and 1935 might be due to these persons being children during world war I and having their resistance lowered. But mortality was not the right index of measurement. Morbidity figures would probably better relate events to the particular environment in which they had their inception.

Formal notifications numbered nearly 50,000 in 1931, 35,000 in 1939, and 43,000 in 1944, the war-time incidence affecting males much more than females. In the years 1940–44, 163,000 notifications were expected, but 202,500 actually occurred. Possibly the explanation lay partly in diagnosis on entry to the Forces and in mass radiography. During the three years, 1942–44, the increase of incidence over the 1936–38 rate was 12% in Wales but 25% in London, which first showed the changed direction of the curve in 1939–41. In Glasgow there was an increase of 48% for males and 65% for females (78% and 121% in age-group 0–15).

Dr. NORMAN ENGLAND said that up to now the only moderately accurate data in our possession had concerned fatalities; we knew next to nothing about morbidity and nothing even about the proportion of those primarily infected in each age-group who eventually developed disease. We must be able to measure the success or failure of our own attacks on the disease, and the statistical method was the only one which would guard us against inaccuracy. The requirements were (1) careful truthful records; (2) sure "national" statistics; (3) a campaign which, while based on proven experience, had a place for new methods; (4) the setting up of a central Bureau of Tuberculosis Statistics to organise and carry out inquiries.

The meeting resolved "that the council of the Tuberculosis Association should consider approaching the Joint Tuberculosis Council with a request that a Bureau of Statistics for Tuberculosis problems should be set up."

Reviews of Books

Rare Diseases and Some Debatable Subjects

F. PARKES WEBER, M.D., F.R.C.P. London: Staples Press. Pp. 174. 15s.

ACCOUNTS are here collected in one small volume of a number of the conditions which Dr. Parkes Weber has so often interpreted at medical meetings. His title is apt, for no-one is more knowledgable of rare diseases, or more able and willing to debate them with kindness and patience. "Disease," he writes on the first page, is often a "courtesy title" for a syndrome of unknown causation. Thus some fibrocystic diseases of bone are syndromes, whereas hyperparathyroidism is a disease, the cause of which—a parathyroid adenoma—is known. Rare diseases, few of which any doctor is likely to see unless he attends clinical societies, are not exceptions to nature's laws; they may be valuable guides which "prove"—that is, test—the rules and theories of commoner diseases, shedding light upon genetic or other antecedents.

Over thirty conditions or groups are included, omitting the blood diseases and some others. The Sturge-Kalischer-Weber disease (adopting Dr. K. Blum's nomenclature, modestly relegated by the author to a footnote) is one that, like several others, could hardly fail, if once seen, to be recognised; unfortunately the radiogram is not very clear. Various uncommon affections of the skin and subcutaneous tissues, including blushing and flushing, are described; and rheumatic nodules, thrombo-angiitis obliterans, Paget's bone disease, and some familial relations are well discussed. In a family subject to "renal" glycosuria, intercurrent illnesses had been ascribed to diabetes mellitus and one member had been treated with insulin. There is a chapter upon the agnosia of hemiplegia, especially that of cerebral blindness, the patient denying both the blindness and the paralysis; one man claimed that he could see everything, though he thought in broad daylight that it was night. The distinction from hysterical blindness is discussed.

Any doctor of experience who owns this valuable little book will say to himself, probably more than once, "I have seen this or that complaint but did not recognise it."

Acquisitions médicales récentes dans les pays alliés

A. ABAZA, ancien interne des hôpitaux de Paris. Paris: G. Doin. Pp. 706. Frs. 1000.

Dr. Abaza, who is deputy director of the epidemic control and medical intelligence branch of the health division in London of UNRRA, has summarised for his fellow-countrymen the advances in therapeutics in this country and in the United States since the fall of France in 1940. Penicillin, the sulphonamides, thiouracil, the newer insulins, the synthetic œstrogens, and a host of other subjects are reviewed, and in every case a very full bibliography is provided. This is international coöperation at its best, and we congratulate Dr. Abaza on his skill in presenting such a vast subject so cogently. Many Englishmen and Americans will also benefit from studying the book. Perhaps Dr. Abaza will consider providing English readers with a survey of the advances in medicine—such as the treatment of lupus with massive doses of vitamin D—made in France during the years of the occupation.

Pathology of Tropical Diseases

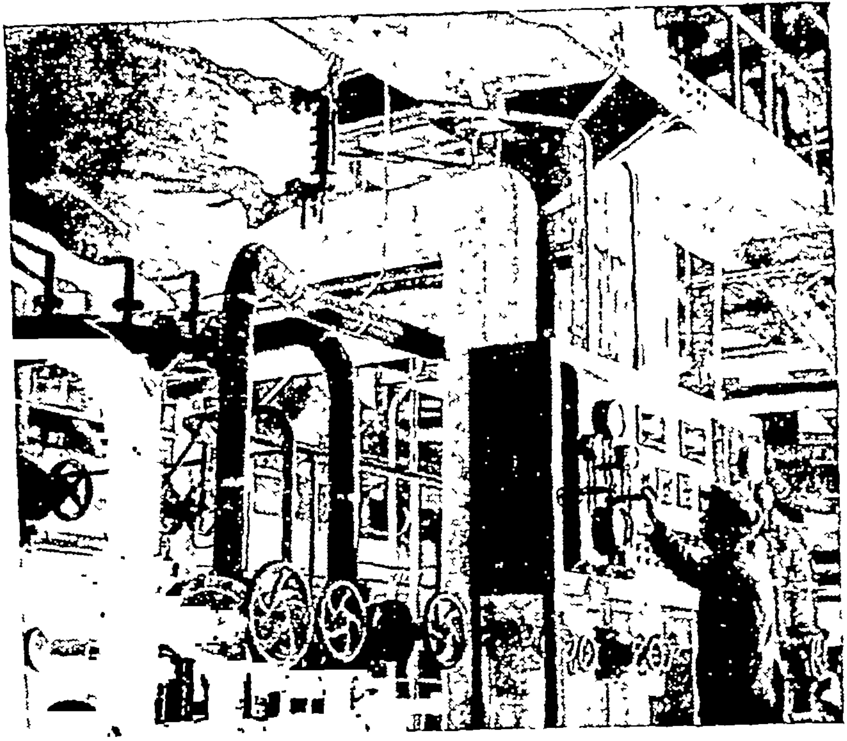
An Atlas. J. E. ASH, colonel, M.C., A.U.S., director, Army Institute of Pathology, Army Medical Museum; SOPHIE SPITZ, M.C., G.S., A.U.S., pathologist to the institute. London: W. B. Saunders. Pp. 350. 40s.

THIS well-balanced atlas sets forth the pathology of tropical and allied conditions, including the virus diseases, bartonellosis, the rickettsial diseases, the tropical treponematoses, and the spirochætal infections, and the commoner tropical bacterial diseases. The protozoal, ciliate, and other types of colonic disease are described in the section dealing with bacillary dysentery, and further chapters describe the pathology of the more important protozoal infections, malaria, leishmaniasis, and trypanosomiasis. There are good sections on the various fungal diseases, and the main nematode, trematode, and cestode infestations. A short chapter on the effects of heat is followed by sections dealing with the pathology of various deficiency diseases. The detailed pathology of each condition is clearly described, and the book is well illustrated by photographs, maps, and diagrams. A brief account of the epidemiology, diagnosis, and clinical features of each condition ensures that the pathology is integrated into the whole disease picture.

Pre-School Centres in Australia

(The Lady Gowrie Child Centres.) J. H. L. CUMPSTON, M.D., Commonwealth Director-General of Health; CHRISTINE M. HEINIG, M.B., Federal Education Officer, Australian Association for Pre-School Child Development. Canberra: Commonwealth Dept. of Health. Pp. 229.

LIKE the illustrated sales catalogues studied enviously in childhood, this is for us a record of the unattainable, for it describes a spacious and pleasant expansion of nursery schools. The first official nursery schools in Australia were built in war-time, but the book also describes a programme for building and equipping six pre-school centres in six capital cities. Staff and equipment in this country would never be forthcoming to run three separate nurseries for 2-year-old, 3-year-old, and 4-year-old children, but not all would advocate it. Perhaps less detail might have been given about space and equipment, which is bound to be affected by local conditions, and more about staffing and personnel, and the more general problems raised by the care of the children themselves. Nurseries, even as beautiful as these, do not survive in their bricks and mortar only.



PENICILLIN

For minor infections. The imposing list of indications for penicillin (injection and drip-infusion) therapy must not obscure the very great importance of this wholly non-toxic substance in the treatment of minor infections. Penicillin is unaffected by the presence of serum or pus, is completely innocuous to the leucocytes, and has a higher activity against the common pathogenic organisms than any other chemotherapeutic agent.

It has great value, therefore, in the treatment of septic cuts, abrasions and burns, boils, sore throats and many other every-day conditions; and may well alter the whole conception of prophylactic treatment of those minor ailments.

PENICILLIN *Glaxo*

DRY SODIUM SALT FOR INJECTION IN AQUEOUS SOLUTION

In vials of 100,000; 200,000; 500,000; and 1 mega (1,000,000) units.

Manufacturers of
PENICILLIN

PENICILLIN LOZENGES B.P. for local therapy

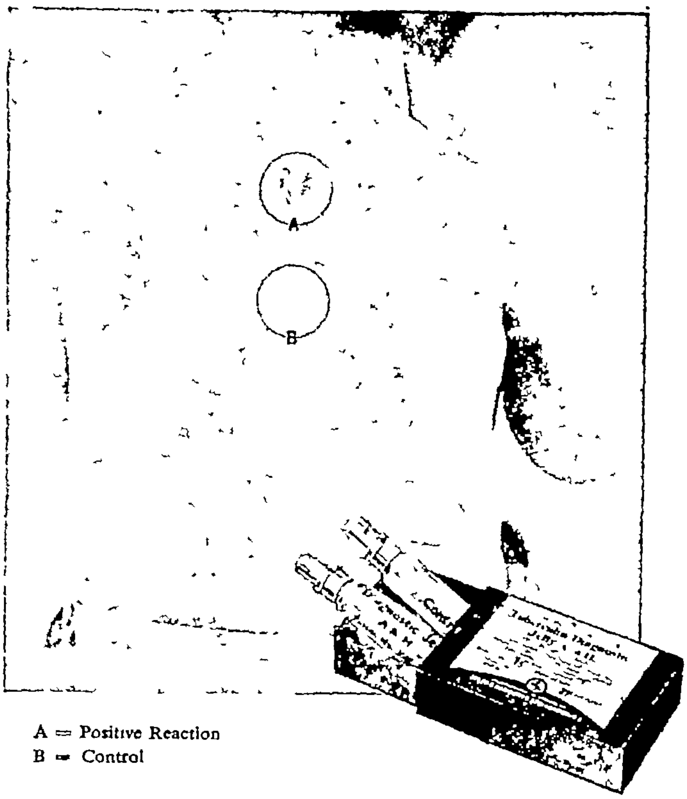
Local application of penicillin by means of lozenges has a special value in the treatment of most of the common streptococcal infections of the mouth, throat and pharynx.

The period of infectivity after scarlet fever can also be reduced. The average dose consists of 6-20 lozenges. Each lozenge contains 500 units of calcium penicillin. Bottles of 50 and 500

OILY INJECTION OF PENICILLIN B.P. for intramuscular injection.

125,000 units per cc. of calcium salt in oil and beeswax. 10 cc. vials.
The purpose of this suspension is to prolong the action of penicillin for 12 hours.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434



A = Positive Reaction
B = Control

A Simple and Accurate Tuberculin Skin Test

The application of Tuberculin Diagnostic Jelly A&H to the skin is a convenient and reliable means of detecting positive reactors to old tuberculin. In controlled observations, the results have been as reliable as those obtained with the intracutaneous technique of Mantoux.

The test does not involve the discomfort of injection; it is easily and rapidly carried out; the area of positive reaction is sharply circumscribed; there is *no untoward local or constitutional reaction,* and *no risk of infection.*

(See reports *Brit med J.* (1944) i. 531—*Med Off* (1945) lxxiv. 209—*Lancet* (1946) i. 162.)

It is available in tubes of 2 gm. (20 tests) and 5 gm. (50 tests).

Therapeutic Substances Act, Licence No 6a.

TUBERCULIN DIAGNOSTIC JELLY A&H

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE: BISHOPSGATE 3201 (12 LINES) TELEGRAMS: GREENBURYS, BETH, LONDON

THE LANCET

LONDON: SATURDAY, JULY 20, 1946

Future of Postgraduate Education

In his Frederick Price lecture to the Royal College of Physicians of Edinburgh last week, Sir **Francis Fraser** said that the aim must be to enable every doctor to be in constant touch with leaders and teachers of medicine. Hitherto, shortage both of replacements and of suitably qualified teachers has hindered postgraduate studies; but these difficulties should eventually be overcome. In the proposed National Health Service each region, "centred for professional guidance on a university and its medical school," will be composed of areas each of which will provide all the ordinary hospital and specialist services. The main hospital in each area will be staffed by specialists who could contribute largely to the further development of postgraduate teaching; they will be in contact both with the university and medical school of the region and with general practitioners and the staffs of the smaller hospitals. The professors and other teachers of the university departments should, in Sir **Francis Fraser**'s opinion, be fully occupied in the basic education of undergraduates and in research, and should only exceptionally be diverted to postgraduate instruction; so it may well be advisable to adopt the practice, now being rapidly developed in London, of instituting chairs and departments expressly for advanced education in those branches of medicine and surgery that belong more especially to the postgraduate field. The universities' acceptance of responsibility for developing postgraduate education is welcome, since it makes sure that the instruction will be of university standard; in other words, it will be not simply technical and vocational but also rational and cultural, thus fostering both knowledge and judgment. "A national medical service," said Sir **Francis**, "might easily produce a corps of time-servers. The maintenance of its standards is, therefore, a vital problem now for the medical profession, and the answer to the problem is largely an educational one and one for the medical schools to supply." In a letter to Monday's *Times* Lord **Moran** likewise puts great emphasis on the part the universities should play through their influence on postgraduate teaching at hospitals working under the regional boards:

> "Each university must demand that every teacher in its region is recognised and approved by its medical faculty, just as all those who now teach in the twelve medical schools of London have to apply to the London University for recognition. In that fashion the faculty will ultimately be largely responsible for the quality of the staffs and in consequence for the efficiency of all sizable hospitals outside the special 'teaching group'."

Lord **Moran** points warningly to the alternative, which he dreads—namely, that the undergraduate teaching hospitals will be a caste apart, while the hospitals under the regional board provide an inferior service and their staffs lose heart.

Turning to the training of the clinical specialist, Sir **Francis Fraser** said it is generally agreed that at least five years' postgraduate instruction is needed for his education. The holding of a hospital appointment does not, of itself, suffice. The candidate's duties must be light enough to enable him to study his cases thoroughly; he should share his problems, in group discussions; he must have ready access to libraries, and he should be in touch with other clinical departments; part of his training period should be spent in the preclinical departments of a medical school or in a laboratory; he should be encouraged to undertake research and to show his aptitude for teaching; and above all he must be supervised. In short, the training of specialists can only be carried out in a well-provided university department; and a system of transfer from one unit to another and from one hospital to another should be devised.

The further education of general practitioners has hitherto been limited to intensive refresher courses, developed particularly in London, and to regular meetings for discussion, as practised at Newcastle-on-Tyne. Sir **Francis** thinks that their needs could best be met by (1) clinical assistantships at nearby hospitals, (2) regular half-day sessions at the chief area hospital, (3) short courses, lasting one or two days, on recent progress in specific subjects, at the regional medical school or teaching hospital, and (4) intensive general refresher courses of a week or more, to be attended once a year at a centre remote from the place of practice. The intensive general refresher course lasting two or three weeks, and attended at intervals of several years, is not entirely satisfactory, either for the practitioner, who is liable to mental indigestion, or to the teacher, who is often conscious that the time given to preparing lectures is largely wasted. There is much truth in the suggestion that general practice is itself the most difficult of the specialties and that these courses rarely include discussion of the problems that most concern practitioners. To carry out the proposed programme, medical schools will have to enlist the help of many hospitals. It will be some years before it can be brought into full operation, but a beginning can be made now, and a postgraduate dean or director and a postgraduate committee should be appointed in each medical school or faculty. The unique facilities offered by London are to be developed by the British Postgraduate Medical Federation,[1] which has been established by the University of London to coördinate the many general and special hospitals, both voluntary and municipal. The aim is to develop for postgraduate students university departments in each of the major specialties. It was originally proposed that the component departments and institutes should be sited close to each other and to a central hospital or group of hospitals, and though this plan is at present impracticable an influential committee is now considering what parts of the centre should be completed first. Meanwhile a central office has already been opened, to marshal the scattered facilities. It will, among other functions, organise postgraduate studies for practitioners in the London area, and one of its most important duties will be to provide for the large numbers of graduates from overseas. It should become a channel for distribution to all parts of the United Kingdom.

This country, because of its geographical, economic, social, and political position, is suitable for the establishment of a great postgraduate medical organisation

---

[1] See *Lancet*, 1946, i, 507, 693.

Annotations

MENTAL HOSPITALS IN THE NEW SERVICE

AMONG benefits to be expected under the new National Health Service one is outstanding: the mental hospitals, instead of working in isolation as they have done in the past, are to become an integral part of the service. At its annual meeting last week the Mental Hospitals Association heard addresses on the new situation by Dr. Thomas Beaton, superintendent of St. James Hospital, Portsmouth, and Mr. R. H. Adcock, clerk of the Lancashire Mental Hospitals Board. Both believe there are great advantages and widening prospects in the new service, provided there is sufficient representation on the Central Health Services Council and the regional hospital boards. Dr. Beaton mentioned the benefit to the hospital of management, until now, by an experienced visiting committee appointed by the local authority, but Mr. Adcock feels that these committees have long been anachronistic, and that, by keeping mental health out of the main stream of local-authority affairs, they have delayed public acceptance of the value of psychological medicine. The development of psychiatric departments in general hospitals is already foreseen, but he suggested the possibility of a reverse process, mental hospitals set in rural communities becoming also the general hospitals of their area. Certainly such a widening of function would free mental hospitals of the stigma which now attaches to them, and would presumably make a great difference to the number of patients willing to seek voluntary treatment. During the war parts of many mental hospitals have been used for casualties, and it might therefore seem a good moment to extend their functions; but it must be borne in mind, as Dr. Beaton pointed out, that nearly all mental-hospital buildings are seriously out of date; moreover, mental-hospital accommodation is still below the country's needs. Dr. Beaton thought that no hospital should be built to last more than twenty years, and that simple light buildings, which can be extended and improved, are to be preferred to more solid structures which will become obsolete. He is disquieted by the divorce, in the Bill, of the hospital from the domiciliary services and hopes that "so far as it relates to mental health the new National Health Service will be comprehensively organised to deal with both hospital and home, so that the direction of treatment may be consistent throughout."

ADRENALECTOMY FOR PROSTATIC CANCER?

NOT long ago surgeons found that the distressing symptoms of prostatic cancer might be greatly relieved by castration; but the relief, though sometimes striking, is seldom permanent. What causes the temporary easement? We know that non-malignant prostatic tissue shrinks after castration, and it might be thought that shrinkage of normal tissue around the growth would reduce pressure on adjacent nerves and so abolish the pain. But it has been reported that the relief extends to pain caused by spinal metastases, which of course do not consist of healthy prostatic substance but of cancerous tissue. We may therefore be tempted to suspect that the growth even of metastases partly depends on androgen. Supposing this revolutionary suspicion to be correct, how can we account for the fact that removal of the testes gives only transient respite? There is still a plausible, though perhaps specious, reply. In the laboratory it has been found that the testes are not the only source of androgen; the adrenals also secrete this type of hormone, though of a kind and quantity that are relatively ineffective. After castration the adrenals enlarge, and their secretion of androgen is amplified. This increased androgen production by the adrenals might conceivably account for the recrudescence of an androgen-sensitive prostatic cancer some time after its growth had been checked by castration. If this thesis were correct our business might be to curtail the further supply of androgen from the adrenals by their removal, sustaining the patient afterwards by substitution therapy.

This hypothesis must be reviewed in the light of recent work by Huggins and Scott.[1] These pioneers removed the adrenals from four men with prostatic cancer, who had been relieved by castration, but 3–8 months later were again suffering severely. Two of the patients survived long enough (11 days and 116 days) for noteworthy results. In both, removal of the adrenals caused a sustained diminution of urinary 17-ketosteroids (androgens) to a low level—namely, 1·4 mg. and 1 mg. per litre—as compared with 8–12 mg. per litre before adrenalectomy. But autopsies revealed that, in spite of this decrease, malignant growth was still active in both instances.

We can only conclude, as the authors have done, that, despite the evidence in its favour, adrenalectomy is not a practical method of treating patients with prostatic cancer who have a recrudescence of the disease after temporary relief through castration. The question remains why castration mitigates the symptoms of prostatic cancer and why this mitigation is not permanent.

DISTRIBUTION OF BLOOD-GROUPS

DURING the war G. L. Taylor and his co-workers examined the blood-groups of 190,000 people, mostly in the R.A.F., who were drawn from all over the United Kingdom. They also examined some foreigners—Belgian, Czechoslovak, Dutch, French, Polish, and Turkish—though the numbers were small. The findings have now been published by Dobson and Ikin.[2] The distribution of blood-groups among the 190,000 R.A.F. men, which can be taken as representative of the distribution for the United Kingdom, was: group O 46·7%, group A 41·7%, group B 8·6%, and group AB 3·0%. The incidence of abnormalities was very small. Thus cold agglutinins were detected in 61 persons, and in 15 cases (3 of group O, and 12 of group A) there was a deficiency or complete absence of anti-B agglutinin; in only one case (group O) was anti-A agglutinin completely absent. These figures differ little from those already known, such as those recorded by the Hirzfelds[3] in 1919: group O 46·4%, group A 43·4%, group B 7·2%, and group AB 3·0%.

The findings in the small foreign samples are also in accordance with figures recorded by others, and show the characteristic fall in the frequencies of groups O and A and the rise in group B as one moves south and east across Europe; the Czechoslovaks clearly belong to the eastern European type. The variation of blood-group with race has been the subject of much research, summarised by Lattes.[4] The western Europeans correspond more or less to the figures now given by Dobson and Ikin. Of the inhabitants of southern Asia and Africa, 30–40% are in group O, and group B is more common than group A; the Indians and Chinese are mostly similar, but over 10% are in group AB. There is the curious "Hunan" group of Chinese with a distribution like that found by Dobson and Ikin in their Czechs—i.e., group O 28·4%, group A 46·2%, group B 15·7%, and group AB 9·7%. The American Indians, both north and south, are remarkable for being nearly all group O. Within these large averages, smaller variations occur from place to place, as Dobson and Ikin illustrate with small samples from Cambridge and London. Their figures will form a firm basis for the assessment of blood available for transfusion.

---

1. Huggins, C., Scott, W. W. *Ann. Surg.* 1945, 122, 1031.
2. Dobson, A. M., Ikin, E. W. *J. Path. Bact.* 1946, 58, 221.
3. Hirzfeld, L., Hirzfeld, H. *Lancet*, 1919, ii, 675.
4. Lattes, K. The Individuality of the Blood, Oxford, 1932.

TREATMENT OF RINGWORM OF THE FEET

MOST of us take a personal interest in tinea pedis, for—like piles, toothache, and sore throats—if we manage to escape it ourselves it will not be long before some member of our family is clamouring for attention.

In America, Sulzberger and Kanof[1] have found that talc mixed with undecylenic acid (2%) and zinc undecylenate (20%) gives a reasonable degree of protection, and is much more satisfactory than powders containing boric and salicylic acids. This powder has a smell, and sometimes causes a burning sensation when applied, but these have not proved serious defects. Nickerson and others,[2] in an investigation among the U.S. Army Air Force Proving Ground Command, observed that if sandals were worn instead of shoes the incidence of infections of the feet was considerably diminished. In Britain, Gray[3] suggests that the toes and the webs between them should be washed aily, carefully dried, and then dusted with a powder ontaining 1% salicylic acid in talc or kaolin. He doubts he wisdom of the rule that bathers should paddle in olutions of sodium hypochlorite or sodium thiosulphite efore entering and after leaving the bath, and advocates imple personal measures of prophylaxis for those who hare bedrooms and bathrooms with others. It is learly unwise to walk about in bathing places or bathooms with bare feet; each person should have his own ath mat, and rubber shoes should be worn where possible n swimming-pools. It is important, particularly in hese days of clothing coupons, to insist that uninfected eople should not wear the socks and shoes of a person with ringworm of the feet. No certain method of sterilising these articles has yet been found; probably the best method is to place shoes and socks for 24 hours in a cabinet containing a saucer of pure formalin. Despite all such precautions the malady is hard to stamp out because many infected people are unaware of their condition.

In treating tinea of the feet it is often forgotten that the fungi act as irritants, causing a reaction which affects mainly the superficial layers of the skin and leads to eczematous lesions. As Gray points out, the physician must consider not only the nature of the irritant but also the reactivity of the skin, which varies widely in different people and may be influenced by the patient's general health and the local health of the invaded integument. Once an eczematous reaction is started, no matter whether the toxic agent is chemical, physical, bacterial, or fungal, the reaction can continue long after the agent has been removed; not only may the lesions spread locally but similar lesions may develop on other parts of the body. Moreover, a skin inflamed by fungus invasion can easily be sensitised to chemicals, so clinical manifestations of the malady—or something very like them—may be caused by injudicious or protracted therapy. In the early stages of invasion, Gray has found Castellani's carbol-fuchsin paint most effective, but 2% gentian violet, tincture of iodine, Whitfield's ointment, and 0·2% dithranol ointment are also of value; the powder used by Sulzberger and Kanof[1] for prophylaxis has also been used for treatment with success. The feet should be thoroughly washed each day before these remedies are applied. Treatment should continue for a fortnight, and thereafter only a bland dusting powder should be used. "If after another week any traces of infection remain, the treatment should be repeated and so on until the skin becomes normal. Care must be taken not to overdo the treatment or the skin will become inflamed." In cases with much inflammation, the blebs should be opened, their walls cut away, and the feet soaked and dressed with a 1 in 4000 solution of potassium permanganate. As far as possible, the feet should be kept at rest. When the inflammation subsides, Castellani's paint or 2% gentian violet can be substituted. In chronic cases associated with hyperkeratosis ung. acid. benzoic. co. is most useful, and if the hyperkeratosis is very thick the salicylic acid may be increased to 6% and the benzoic to 10%. The ointment should be rubbed into the thickened patches daily, after washing well with soap and water and rubbing away as much dead skin as possible with a piece of lint or pumice-stone. Often progress is slow, and when treatment has to be maintained for many weeks it should be stopped and a bland powder substituted for a week or two each month; otherwise it is difficult to ascertain what progress has been made. Barium sulphide depilatory paste may be used for removing a very thick horn layer, but it is a powerful irritant and must be applied with great caution. When tinea affects the nails it is very refractory. A sound method of treatment is to soak the nails in 1 in 4000 potassium permanganate, file them down, and then paint them with Castellani's paint or rub in Whitfield's ointment. Recurrence is common, especially in hot climates. If only one or two nails are involved it may be worth considering their removal, with the nail-bearing areas.

If the claims made by Freis[4] for the treatment of dermatophytosis with formaldehyde or cupric sulphate iontophoresis are confirmed his method may be widely followed. Freis uses a simple circuit containing a rheostat in series with a 45-volt dry-cell battery and a milliamp meter. The negative lead ends in a pad soaked in saline, which forms the indifferent electrode. The positive lead ends in a solution of either 1% formaldehyde or 1% copper sulphate in a porcelain footbath. The patient immerses his foot in the bath, places his hand on the saline pad, and sustains without much discomfort a current of 10–12 mA. for 20 minutes. Patients with mild infections receive two or three treatments with formaldehyde on successive days; those with severe infections are given three or four treatments on alternate days. The formaldehyde may irritate severely infected skins, and for these copper sulphate is preferable, 5–12 treatments being necessary. Freis dresses denuded secondarily infected areas after therapy with 5% sulphathiazole ointment, but only for short periods. Iontophoresis seems suitable for dealing with outbreaks of tinea pedis in naval or military establishments or in schools, and it may also prove useful in private practice.

DOMESTIC HELP IN HOSPITALS

EVEN those who hold diverse views on the future of nursing agree that the immediate crisis is closely bound up with the difficulty of getting domestic workers for hospitals. King Edward's Hospital Fund for London, which has already done great service to nursing with memoranda on the *Supervision of Nurses' Health* and *Hospital Diet*, has now come forward with timely and practical suggestions about hospital domestic staff,[5] and it is characteristic that the approach does not merely cover familiar territory but breaks fresh ground. A committee, under the chairmanship of Mr. Malcolm McCorquodale, P.C., found that the problem of getting enough domestic staff was not confined to some London hospitals but was common to all, and serious in 55 out of 60; so it would not do merely to recommend the best current practice in any one hospital. They therefore sought help from experts on personnel management, economy or dilution of labour, training, supervision, and welfare. They welcome the appearance of the national minimum

---

1. Sulzberger, M. B., Kanof, A. *Nav. med. Bull., Wash.* 1946, 46, 822.
2. Nickerson, W. J., Irving, L., Mehmert, H. E. *Arch. Derm. Syph.* 1945, 52, 365.
3. Gray, A. *Mon. Bull. Min. Hlth & E.P.H.L.S.* 1946, 5, 100.
4. Freis, E. D. *Arch. Derm. Syph.* 1946, 53, 34.
5. Recommendations on the Employment of Domestic Staff in Hospitals. King Edward's Hospital Fund for London. Obtainable from Geo. Barber and Sons Ltd., Furnival Street, London. E.C.4. Pp. 34. 9*d*.

scales of pay and standard conditions of service adopted by the National Joint Council; and they suggest that, to meet the present emergency, the scheme for bringing over workers from Europe should be continued and extended. In particular they draw attention to large numbers of Balt women who are being maintained as displaced persons in camps in North Germany. In considering long-term policy they note that the status of factory work for women has greatly advanced in the present generation, but that domestic work of all kinds has lagged far behind. They ask early in the memorandum whether, in hospitals, the domestic arrangements and methods have been adjusted to meet changed conditions, or whether they have "persisted without revision since the days when domestic labour was cheap and abundant." Hospitals could lead the way in improving the status of domestic work by offering well-planned training schemes and far more opportunities of promotion. Sometimes hospitals must compete for staff with neighbouring industries, and here it is an advantage, as the committee point out, that the national wage rates are minima. Though it is natural, at first, to regard any considerable advance in wages as "beyond the means of the hospital," yet a higher remuneration has sometimes proved an economy if it attracts a better and more stable type of worker, who in fact prefers hospital work but can only afford to take the job which pays her best.

An important recommendation is that in all hospitals of sufficient size there should be a full-time domestic supervisor and welfare officer who would constantly seek recruits by keeping in touch with employment exchanges, primary, technical, and trade schools, and youth organisations, by advertising vacancies or training schemes, and by gaining the active interest of patients and visitors. She would interview and engage recruits, place them in the most suitable type of work, arrange rotas and holidays, keep records, have control of cleaning materials and equipment, modify wages within an authorised scale, and arrange for routine medical examination of staff, the meeting of National Health Insurance claims, and convalescence; she would also supervise the maids' home and plan recreations, social activities, clubs, a national savings scheme, a lending library, and opportunities for continued education. She would establish staff committees to deal with suggestions or complaints, and she might give student nurses some instruction in domestic science and practical housecraft; her own qualifications would not include nursing. The committee think that, besides having the right personality for the work, she should have training and experience in institutional management or domestic science, and that a short course in personnel management should complete her qualifications; she should be responsible to the matron except in money matters, for which she should be directly answerable to the hospital board. The post should be equal in status and pay to comparable posts in industry in the area. A special duty of the supervisor would be to have a close knowledge of the labour market in the neighbourhood, so that she could foresee changes likely to affect the supply of domestic staff, and suggest steps to meet them.

The committee advise that, as it becomes available, more labour-saving equipment should be used; but since hospitals differ in their opinions of the value of various items of equipment, they suggest that one of the ministries might organise an exhibition of domestic labour-saving appliances, showing only those which have stood the test of hospital use. Meanwhile domestic work in hospitals should be reviewed to see how workers can be used more economically: waiting at table on the doctors is out of place, they remind us, when a hospital is acutely short of staff. Ward orderlies are being appointed in a growing number of hospitals; and male domestic orderlies can be of great service. Scrubbing is not, and never was, a suitable occupation for elderly women, and few of them may need to seek it in future; whereas many men without special qualifications leaving the Services, and especially the Navy, are expert and hardy scrubbers, and some may be willing to supplement pensions by working in their local hospitals. Here again payment of a higher wage may prove an economy.

The committee favour the straight-shift system wherever possible, and make various other suggestions for the comfort and convenience of workers: provision of transport, better accommodation and amenities, a minor-ailments clinic, pensions, and attractive uniforms are all discussed. The proposal that hospitals should provide a day nursery for the children of domestic workers is outstandingly sensible; it has been adopted with great success at Roffey Park Rehabilitation Centre.

CHEMOTHERAPY OF SCRUB-TYPHUS

SINCE Woods[1] first showed that the therapeutic activity of sulphanilamide is inhibited by *para*-aminobenzoic acid this compound has received considerable attention in the laboratory and more recently at the bedside. There is evidence that it will reduce the severity of the clinical symptoms caused by pathogenic rickettsias; and hitherto there has been a striking lack of drugs effective against this group of organisms. In 1942 Snyder and colleagues[2] reported that 80% of their mice inoculated with murine typhus survived when they were fed on a ration containing *p*-aminobenzoic acid, whereas only 20% of the untreated control mice recovered. Later Hamilton and others[3] noted that large amounts of this compound inhibited the growth of epidemic and murine rickettsias in the yolk-sacs of developing chick embryos. An independent discovery[4] confirmed that *p*-aminobenzoic acid would prevent the growth of murine rickettsias in both mice and eggs.

These observations were applied clinically in louse-borne typhus by members of the American Typhus Commission[5] in Cairo with encouraging results. They gave an initial dose of 4–8 g. of *p*-aminobenzoic acid by mouth followed by 2 g. every two hours in an effort to maintain a blood concentration of 10–20 mg. per 100 c.cm. In a report so far unpublished on louse-borne typhus among Hausas on the Bauchi Plateau in Nigeria, Montgomery and colleagues[6] note that though the results of oral administration of the drug were not dramatic no deaths occurred in the treated cases, whereas the mortality for the whole outbreak was 25%. In Rocky Mountain spotted fever Anigstein and Bader[7] showed that *p*-aminobenzoic acid protected guineapigs when given at the time of inoculation of the rickettsias, and Rose and others[8] have reported a case successfully treated with the drug.

In scrub-typhus or tsutsugamushi disease *p*-aminobenzoic acid has also proved valuable. In mice[9] the oral and parenteral administration of the sodium salt of *p*-aminobenzoic acid reduced the mortality from experimental infection with scrub-typhus. Tierney[10] has now reported that clinically in man also this compound exerts a therapeutic action. The drug was given by outh as a powder partly neutralised with sodium carbonate to lessen gastric irritation, 10 c.cm. of a % bicarbonate solution being mixed with each gramme p-aminobenzoic acid; the best dosage was 8 g. to egin with, followed by 3 g. every two hours, which gave blood concentration of 30–60 mg. per 100 c.cm. within vo days. There is, however, considerable variation om patient to patient in the ability to build up and aintain a satisfactory blood-level of p-aminobenzoic cid; so ideally the blood concentration should be stimated daily—a difficult task in the middle of a typhus pidemic. To allow for variations in the severity of crub-typhus alternate cases received the drug: of the otal of 34 treated patients 16 were American, 16 Indian, nd 2 Chinese. The specific treatment was continued or a week after the temperature had reached normal. n the control cases the fever lasted on the average ten ays longer than in those receiving p-aminobenzoic cid. In the treated patients headache and lymphadenitis ere less severe and complications, such as bronchitis, educed. Of the treated cases only 1 was severe and one died, while 3 of the untreated controls died and 7 ere gravely ill. Convalescence was shorter in the reated cases than in the controls. In 4 patients there as a fall in the granular white-cell count; this rose gain as soon as the course was ended, but total and ifferential blood-counts should be done in patients ndergoing treatment with the drug. Very large doses f p-aminobenzoic acid caused slight delirium, but when he blood-level was maintained at 30–60 mg. per 100 c.cm. here were no mental symptoms.

---

[1] Woods, D. D. *Brit. J. exp. Path.* 1940, **21**, 74.
[2] Snyder, J. C., Maier, J., Anderson, C. R. *Rep. Div. med. Sci. nat. Res. Coun.* 1942.
[3] Hamilton, H. L., Plotz, H., Smadel, J. E. *Proc. Soc. exp. Biol., N.Y.* 1945, **58**, 255.
[4] Grieff, D., Pinkerton, H., Moragues, V. *J. exp. Med.* 1944, **80**, 561.
[5] Yeomans, A., Snyder, J. C., Murray, E. S., Zarafonetis, C. J. D., Ecke, R. S. *J. Amer. med. Ass.* 1944, **126**, 349. See *Lancet*, 1945, i, 60.
[6] Montgomery, T. H. L., Budden, F. H., Findlay, G. M., Elmes, B. G. T. Unpublished report, 1946.
[7] Anigstein, L., Bader, M. N. *Science*, 1945, **101**, 591.
[8] Rose, H. M., Duane, R. B., Fischel, E. E. *J. Amer. med. Ass.* 1945, **129**, 1160.
[9] Snyder, J. C., Zarafonetis, C. J. D. *Proc. Soc. exp. Biol., N.Y.* 1945, **60**, 115. Murray, E. S., Zarafonetis, C. J. D., Snyder, J. C. *Ibid*, p. 80.
[10] Tierney, N. A. *J. Amer. med. Ass.* 1946, **131**, 280.

Since all the rickettsial diseases conform to the same basic pattern it seems probable that in p-aminobenzoic acid we have at last found a promising chemotherapeutic remedy for this group, though its effectiveness is not comparable to that of penicillin and the sulphonamides in bacterial infections.

BREAD-RATIONING

WE in this country have hitherto enjoyed an inestimable advantage over the people of other rationed countries —our bread has been unrestricted. As a result, though our war-time diet has been monotonous and lacking in many everyday luxuries, we have not gone hungry. Even the poorest family has been able to adjust its calorie intake to its needs. Moreover, bread, buns, cake, sausage-rolls, and the like are readily portable foods, requiring no cooking or other preparation by the consumer, so they are the ideal foundation for packed meals and those snacks which sustain when set meals are small and hasty. As rationing has become slowly tighter we have come more and more to rely on bread and flour confectionery to make up our calorie requirements. This is well shown in Dr. Friend's experience at a large boarding-school for boys, as summarised in his letter in this issue. In 1933–39, before rationing had begun, the 800 boys ate on the average about $12^{1}/_{3}$ oz. of bread per day each, whereas in 1939–45 the daily average rose to $14^{1}/_{3}$ oz. Now, however, we shall no longer have this unrestricted class of palatable and convenient food to fall back on: whether we get enough calories to satisfy our needs and our appetites will depend on whether these conform with the allowances drawn up by the Ministry of Food for our age, sex, and occupation.

The scales so far announced are as follows:

		B.U. per week
Children and young people	Under 4 yr.	5
	4–11 yr.	9
	11–18 yr.	13
Normal adults		9
Expectant mothers		11
Female manual workers		11
Male manual workers		15

Those manual workers who are entitled to an extra cheese ration because they take packed meals to work will get an extra 6 B.U. per week, and agricultural workers will also get 14 additional B.U. a week in busy seasons, making their total up to 35 B.U. a week. Each bread unit is equivalent to 7 oz. of bread, $5^{1}/_{4}$ oz. of flour, or 8 oz. of flour confectionery, so the scales of B.U. per week can be read as scales of bread in ounces per day, assuming that the whole ration is taken in bread.

Bread-rationing is expected to save 7% of our present consumption, which is said to be about 77,000 tons a week.[1] Presumably the aim has been to distribute this saving of 5000-odd tons a week so that those who need bread for growth or for energy output (or both) do not go short. Unfortunately there seem to be no published figures of the consumption of bread and flour products among different age- and occupation-groups, but there are a few pointers. Thus McCance,[2] in an experimental study of rationing in the early months of the late war, found that, when other foods were restricted to about the present ration-scales and he was taking energetic exercise, his intake of bread rose to 36 oz. a day to bring his total daily intake up to about 4000 calories. The exercise he was taking would about correspond with that of a farm labourer, who gets 35 oz. daily on the present scale at busy times only. In 1937 Brockington[3] analysed the diet of families in rural Sussex and found that bread came to occupy an increasing proportion of the diet as the family income fell or as the number of children rose. In the largest family it accounted for about a third of the total expenditure on food. Brockington mentions a cowman with a family income of 49*s.* 3*d.* a week who spent 31*s.* weekly on food for himself, his wife, and his six children, and 13*s.* of this was on bread: this was equivalent to about 22 oz. of bread daily per head, whereas the family would get about 11 oz. per head on the present scales; the difference is surely too large to be made up in potatoes.

It seems then that the scales laid down will scarcely meet the needs of some of the highest consumers, and if in future more severe cuts have to be made they should be at the expense of the "normal adults" rather than of the priority classes whose need for bread is as pressing and unavoidable as the need of the farm tractor for petrol.

NEW RESEARCH FELLOWSHIPS

A BEQUEST was made by the late J. W. Luccock "to enable research to be made . . . in the hope that it will be of benefit to the human race and increase the knowledge of the medical and surgical profession as to all matters relating to the blood which may result in the alleviation of human suffering and probably the prolongation of life." This has enabled the University of Durham to establish research fellowships, whose terms were announced in our advertisement columns last week. The fellowships, which are open to both doctors and dentists for full-time research in an approved subject, are tenable by senior fellows for three years at a minimum remuneration of £600 a year, and by junior fellows for one year at a minimum of £300; for each class the tenure may be extended. An important, though fortunately diminishing, impediment to research in this country has been the failure to provide a livelihood for those who are capable of undertaking the work and willing to do so. The Luccock fellowships are a further example of the private beneficence that has gone far towards overcoming the obstruction.

---

1. Ministry of Food figure quoted in *Evening Standard* of July 11.
2. McCance, R. A., Widdowson, E. M. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1946, no. 254.
3. Brockington, C. F. *J. Hyg., Camb.* 1938, 38, 40.

Special Articles

ANTECEDENTS OF CANCER

DR. PEYTON ROUS'S LECTURE

THE Walker prize of the Royal College of Surgeons is awarded quinquennially by the council "to the person, if any, who shall be deemed to have done the best work during the preceding five years in advancing the knowledge of the pathology and therapeutics of cancer." The prize for 1936–40 went to Dr. FRANCIS PEYTON ROUS, of the Rockefeller Institute for Medical Research, New York, and on July 10, when he received it at the college, he delivered a lecture on Antecedents of Cancer.

FAMILIAL TRANSFERENCE

How far back, he asked, do the antecedents of cancer go? Is it a hereditary disease? Instances of hereditary cancer are few and rare—for example, xeroderma pigmentosum, glioma of the retina, and polyposis of the intestine. We are mongrels, and a hereditary basis is not to be traced. This is true of animals also, but the influence of heredity has been got at by brother-and-sister matings of mice, so that after several generations the progeny are as one flesh. Among such mice there are liabilities to individual forms of cancer—of lung, of bone, or of mammary glands. A hereditary influence is there and must be in humans also.

Instances of hereditary cancer leave one in doubt what the basis is. Is it a peculiar responsivity to stimuli? In xeroderma pigmentosum, for instance, it is not the cancer that is transferred but a special sensitivity of the skin to light. The fact that the second eye is also liable to glioma of the retina indicates a special sensitivity in this tissue rather than a direct inheritance of the disease. There is a special sensitivity to carcinogens also. Hairless-strain mice bred fifteen years ago by F. A. E. Crew, in which, when hairless males are mated with hairy females, half the progeny are hairless and half hairy, reveal this greater sensitivity of hairless skin to carcinogens. This was brought out by the appearance of apparently spontaneous skin tumours among the hairless progeny which had been reared by a dealer in a box painted with wood preservative. Subsequently the wood preservative was found when put to the test to be carcinogenic. The hairless mice were then found to get more tumours if painted than the hairy. This is an instance of a natural liability which is inherited.

When there is a familial transference of cancer, the question arises whether it exists in the embryo. The liability to mammary cancer in mice is transferred from mother to baby through the mother's milk. A single suckle is enough. One millionth of a gramme of the mother's milk confers liability and gives origin to whole races of mice with mammary cancer. On the other hand this liability can be prevented by putting the babies to wet-nurse on non-cancerous mothers immediately they are born. This is an exquisite instance of prevention. Time is required for the cancers to grow. The mammary tissue must itself develop. At first nodules of hyperplasia appear and then one or several adenocarcinomas. The whole process is oblique. The known facts indicate that there is a virus in the milk; antibodies can be produced in response to its injection; it increases in endless quantity in the presence of cells. It is a postnatal infection, but the name is unimportant and to be held in abeyance. Like strain liability, the tendency to grow mammary tumours can be increased by painting with œstrogen.

What is the relation of these familial mammary tumours to other conditions? Kidd and Parsons in America have found a papilloma that occurs only in the mouths of rabbits and not elsewhere on the skin. If a mother has it she passes it on to her young. Other familial diseases exist; thus tuberculosis is found to be familial in Philadelphia but conditioned also by poor nutrition and other factors. There are conditioning factors in mouse mammary cancer. In some strains into which it has been introduced it peters out.

INITIATION AND GROWTH

The facts of the familial transference of mouse mammary cancer indicate that investigators must be more daring in thought. Are there potentialities for cancer yet further back in antecedents, in the embryo, for example in cell rests? Gideon Wells in a very extensive study found no carcinomas in the newborn. The earliest (Wilm's tumours) occur in infancy. Dr. Rous described his own experiments designed to test embryonic potentialities. Embryo skin transplanted into inbred mice of the same strain becomes cystic but does not grow. Wrapped around methylcholanthrene dissolved in olive oil, so that the epithelium comes in contact with the carcinogen, tumours occur regularly in a few weeks in the transplants. The same thing can be done with lung and gastric mucosa. The reason the embryo does not grow tumours is because it is sheltered from carcinogenic stimuli in utero, not for lack of liability. The uterus is the only ivory tower man ever knows.

The milk factor of mouse mammary carcinoma causes only adenocarcinomas. Must one suppose that other breast tumours have other causes, each kind a virus of its own? In that case the embryonic tissue must be supposed to require many viruses, because from it may be got so great a variety of tumours. Innumerable kinds of tumours and mixtures of tumours grow; from the lung alone twenty different tumours, each possibly needing its own virus. Is there such an endless variety? Viruses happen to be the only cause known. The possibility has to be admitted of other causes, but viruses must be kept. The possibilities perhaps transcend our imagination, and progress in knowledge cannot stand on biological precedents.

Cancer in later life is dependent on causes acting haphazard and intermittently, and so some escape. It is forced on others by unnatural conditions—for instance, on chimney-sweeps even in boys of 10 or 12 years. The carcinogenic stimuli are enormously diverse, and though tar was discovered to be carcinogenic more than 25 years ago we do not yet know how it or any others act. Present histological techniques are bankrupt for the purpose of telling us this, or the relation of ulcer of the stomach to gastric cancer, or what methylcholanthrene does to the skin. A new school of functional cell histology is required.

REPRESSION OF GROWTH

It was Ribbert who said that the problem of cancer would be solved in the skin because there every stage could be watched. Dr. Rous described his own experiments on rabbit skin from which he had discovered that growth of tumours is conditional, depending on continued use of a carcinogen. If painting be stopped those papillomas that have begun disappear; yet subsequent treatment of the same places with turpentine or chloroform, or subjection to the stimulus of wound healing, encourages growth to begin again. There are two phases of the process, the initiation of a tumour and the promotion of its growth. The initiator causes an irreversible change, but the tumour cells so caused will remain latent in rabbit skin unless continued growth is actively promoted. Even tumours which are already invasive can be arrested in rabbits by stopping treatment with carcinogen. Repression of tumour growth in skin cancer may be brought about by restricting diet by only 5% of the total. No tumours grow even though neoplastic changes have been induced.

These experiments have practical implications. Even tumours that have been started can be repressed when caught young. This has been done in the field of human cancer by taking out the gonads or repressing the action of androgen with œstrogen in prostatic cancer. Some but not all can be repressed. Many exist that remain for ever undetected because their growth is not encouraged. Rich and Moore found on examining the prostates at autopsy of different age-groups that cancer incidence ncreased from 40 years to 90 years from 17 to 29%, igures which are never reached in the clinic. Both cancer nd prostatic hypertrophy might be repressed. The urther back, the weaker is the chain and the more possible is prevention. Palliation by hormone control is just eginning. Cancer prevention by hormone antagonisms nd on the lines indicated by the analysis of cancer ncidence by the Kennaways should be pursued.

CHEMOTHERAPY OF TUBERCULOSIS

HARBEN LECTURES

ON Monday, Tuesday, and Wednesday Mr. WILLIAM H. FELDMAN, D.SC., of the Mayo Foundation (Minnesota, U.S.A.), delivered in London the Harben lectures of the Royal Institute of Public Health.

Although notable advances have been made during the past two decades in the surgical treatment and sanatorium care of the tuberculous patient, something more, he said, is desperately needed. The effectiveness of the sulphonamides against certain acute infectious diseases and the therapeutic value of penicillin make it reasonable to assume that an agent effective in the treatment of tuberculosis will eventually be found. The problem has been to find a substance that will attack the tubercle bacillus without harming the patient. The chief obstacles in the testing of new anti-tuberculosis drugs are the relatively large amount of a drug necessary for an animal test, and (compared with more acute diseases) the long time before one can obtain definitive results. The integrated efforts of many kinds of specialist are required for the development of a successful form of drug treatment in tuberculosis, and this exceedingly important work should be adequately supported by public funds.

When sulphanilamide was introduced it was shown to have a limited but definite deterrent effect on tuberculosis in guineapigs; but unfortunately none of the compounds of this character have proved of any value on human tuberculosis. A closely related group, the sulphones, proved highly effective in the treatment of experimental tuberculosis in animals, and this showed for the first time that the disease produced by the tubercle bacillus would respond favourably to a drug. When used in the treatment of human tuberculosis, the sulphone drugs could not safely be given in doses large enough to produce a similar dramatic effect; but the development of several allied compounds, which have now been used rather extensively in the experimental form of the disease, has provided much basic information justifying the belief that eventually a highly effective and non-poisonous drug—that will be of definite value in treating tuberculosis in man—will be found. The number of compounds yet untried, or capable of being made, is limitless.

STREPTOMYCIN

In his third lecture Dr. Feldman dealt with the use of antibiotics derived from moulds, bacteria, or other organisms. Penicillin, though it has revolutionised the treatment of many infectious diseases, has proved ineffective against the germ of tuberculosis; and, despite nearly half a century's research, no substance that was highly effective against experimental tuberculosis and could be used safely in human beings was found until Waksman, of New Brunswick, discovered streptomycin. In the animal, streptomycin has proved more potent than any previous remedy in the suppression of the tuberculous infection.

Tuberculosis in human beings and tuberculosis in animals are, however, distinctly different, although they are produced by the same micro-organism. The disease in animals is relatively simple in character, and fairly predictable in its course, whereas in the human being it is far more complex; so one must not assume that a drug that is effective in the laboratory animal will be equally effective in man. "A limited number of human cases of tuberculosis has been treated with streptomycin; and while in no instance have the results been spectacular, the results have for the most part been highly encouraging. It is of the greatest importance, however, to emphasise that the tuberculous patient must not refuse or delay conventional forms of treatment in favour of some inadequately tried drug that has shown promise in preliminary trials. While the experimental results with streptomycin, up to the present time, are suggestive of the future possibilities of this new drug, the facts available do not warrant the conclusion that an ideal drug for treatment of clinical tuberculosis has been found." Streptomycin, Dr. Feldman pointed out, is difficult to prepare, and the available supply is exceedingly small: it will probably be many months before there is enough to permit extensive clinical investigation. Clearly, however, it has many advantages over remedies previously tried in the treatment of tuberculosis, and it is likely eventually to find a useful place in medicine. Meanwhile we have learnt that the tubercle bacillus, like the pneumococcus, is definitely vulnerable to the suppressive action of specific drugs. This observation has stimulated investigators all over the world to search for other and better substances, either synthetically from chemicals, or obtained from other micro-organisms.

THE WORLD HEALTH CONFERENCE

FROM OUR SPECIAL CORRESPONDENT IN NEW YORK

AT the time of writing (July 10) the conference has completed its first three weeks, and its sessions are expected to end in about another ten days.

The technique by which the conference transacts its business has now become standardised. The conference meets in plenary session or in one of its five working committees,[1] which are in effect plenary sessions of limited scope. Each working committee has its own small drafting committee. The text of the constitutional proposals drawn up in Paris is discussed, exhaustively and exhaustingly, paragraph by paragraph. The consensus of opinion being obtained and any amendments adopted or rejected, each portion of the text is then submitted to a drafting committee which determines the wording. Ultimately the entire compilation will be returned to the plenary session for acceptance and signature.

Much discussion was aroused by an American proposal, which was eventually rejected, to strengthen the office of the director-general and to weaken the proposed executive board. On the motion of the United Kingdom, it was voted that the director-general shall have direct access to the national health administrations of the various countries. The director-general was also accorded access to non-governmental agencies within member states, to international non-governmental organisations such as the International Red Cross, and to government departments other than health departments.

The Canadian delegation submitted a protocol to establish an interim health commission for the purpose of discharging the functions of the World Health Organisation until such time as the world health convention establishing the W.H.O. comes into force.

The legal committee developed but did not complete its plans for the absorption of the Office International d'Hygiène Publique and UNRRA into the W.H.O. or its Interim Commission. It was agreed that such absorption should be rapid and complete, since it was undesirable to have a multiplicity of intergovernmental health organisations. In the case of UNRRA, once the W.H.O. has declared its readiness for the transfer, an interval of two months will be allowed for technical and secretarial details.

---

[1] See *Lancet*, July 13, p. 58.

If experience shows that in these respects a mistake has been made, an amending Act will be necessary. What makes the Minister so sure that in these respects there will be no need for modification ? Further, these matters will in practice limit quite materially the extent to which the Minister will be able to carry out his declared intention to secure "a very considerable devolution of responsibility to the management committees." The Parliamentary Secretary stated on the ninth day of the standing committee's proceedings that the hospital management committees would be allowed to select, appoint, and dismiss the ordinary staff of the hospital or hospitals with which it is concerned. But we may ask: since actions for wrongful dismissal will be against the regional board, may not that board reasonably require that all dismissals shall be subject to its approval. The regional board as the employer will be the body on which the eyes of the staff, particularly the more senior, will be focused. From that source comes promotion.

Mr. Bevan wishes the hospital management committees to have powers of spending within a global budget; but all expenditure of a committee is to be defrayed by the regional board. Inevitably the regional board will have to have a large accountancy staff. Is it unreasonable to expect that this staff will operate on the same lines as corresponding staffs in the past—the forms, the returns, the correspondence over the smallest variation from approved estimates ? Freedom of expenditure within a global figure either by regional boards or hospital management committees is not provided for in the Bill, and there is no solid ground for thinking that, if not from the start, yet within a relatively short time, the long-established practices and procedures of central finance departments will not begin to be insisted upon; and then goodbye to freedom within a global figure.

What about some of the other reasons put forward by the Minister ? On (ii) a management committee is appointed by the regional board; if a bad one is appointed, the fault will lie with the regional board. Moreover the management committee is to be subject to *specific direction* by the Minister and the regional board, while the Minister has default powers. A query seems permissible on (iii); does it mean that some hospital management committees will have little delegated power (e.g., not even the limited right to choose junior staff); and if so what considerations is it expected will give rise to such variations ? On (iv) leaving aside the question of whether a complete uniformity is desirable—experience of the operation of the Rushcliffe Committee's recommendations on nurses' salaries may be held by some to raise doubts—it is not true that uniformity in the terms of service can be secured only by the arrangements proposed in the Bill. On (v) Mr. Messer in the standing committee voiced the view of many who have been concerned with the nursing service, that in regard to nurses it is essential that they should be identified with a particular hospital.

THE RIGHT SOLUTION

To Mr. Bevan *Hansard* attributes the rhetorical question "How will it be possible for the regional boards to function properly if they are the puppets of the Minister ?" It is equally apposite to ask how can the hospital management committees function properly if they are the puppets of the regional hospital board. It looks very much as if puppets is what they will be, and as if the promised considerable devolution of responsibility will be more apparent than real. And that will mean that the dangers—which the Minister has been inclined to treat lightly as the figments of imaginations perverted by vested interests—of overcentralisation, of excessive strain on members and officers of the regional boards, and of a stifling of local initiative will materialise.

These dangers were dealt with by a special correspondent in the *Times* of July 12, but he saw them from the angle of the burden which would be laid upon the regional boards and thought that they might be diminished by making the regions smaller and having, say, 30 regions, each with an average population of 1,300,000, instead of 20 regions each containing approximately 2,000,000 persons. While the special correspondent's analysis of the situation seems a true one, it's doubtful whether his solution is the best. Far the better plan, both from the point of view of avoiding the dangers of overcentralisation of which he and many others are so conscious, and at the same time of making certain of attracting well-qualified people to the hospital management committees, would be to ensure, in the Bill itself, that hospital management committees were responsible agents for the regional boards rather than rightless puppets. By so doing the Minister would not, in any way, alter the main structure or objects of his Bill, and the devolution of responsibility from the Minister to the regional boards and from the regional boards to the hospital management committees would be effected more efficiently than under the arrangement at present proposed.

Parliament

ON THE FLOOR OF THE HOUSE

WORK in the House was comparatively light last week and several times members were able to get to their bed by midnight. It was almost a holiday, and the Hous has been in sunny mood, like the weather, with a few thunderstorms of not very serious dimensions. Perhap it is the sunshine, or perhaps it is the royal garden parties at Buckingham Palace; but things have certainl looked brighter, especially the dresses of the wome members; and even men, in disinterred morning coat and toppers, have bedecked the summer scene wit fugitive memory of older days. Karl Marx, who kne this country well, was of the opinion that in England social revolution would take place without violence an bloodshed. But it is doubtful if he realised it migh take place according to the accustomed ritual of th British way of life and to the tune of the music of militar bands in the parks.

We had a debate on the Colonies—a most polite debate Mr. George Hall began his review of Colonial affairs by paying a warm tribute to the work of his predecesso Mr. Oliver Stanley; and Mr. Stanley reciprocated But this song of continuity was not echoed by all th members, some of whom evidently thought the Colonie need much more extensive alterations and repairs—as regards our treatment of their native inhabitants—than would be provided by the Colonial Development an Welfare Fund. Mr. Hall did not say, but he implied that the aeroplane has now made the Colonies almos suburban. And the close juxtaposition of races wit such differing standards as those of Limehouse and Lagos will force attention to the need of raising th very low standards of physical health and efficiency an of purchasing-power of the African of Lagos to at lea those of Limehouse.

The only debate in which angry passions were rouse was that on the cut in the soap ration. Mr. Strache said he had scoured the world for fats, but membe were left to consider how they could scour themselv with one-seventh less soap per month. MEDICUS, M.P.

FROM THE PRESS GALLERY

Health Services in the Colonial Empire

In the House of Commons on July 9 a general debat took place on Colonial affairs. Mr. GEORGE HAL the Secretary of State for Colonial Affairs, said th without great improvement in basic economic conditio few of the Colonies could be expected to show substanti social or political progress. Improved social servic could make a contribution to greater efficiency and productivity, and the field of advance which could be opened up in the Colonies by better education was immense. If we could succeed by patient industry in providing the Colonies with more liberty, higher standards of health, and better education, and with larger opportunities of creating their own wealth, then we should have arried out our trust.

Mr. OLIVER STANLEY, speaking on the Colonial medical ervices, said that in the past much too much emphasis had been placed on curative medicine and not nearly enough on preventive medicine. While the hospitals undoubtedly caught the public eye, he wondered whether they really got down to the fundamentals of the Colonial health situation. On one of his visits he saw in one Colony a very good hospital, recently erected, very well equipped, with a great record of cases. But not many miles away he saw an experiment, consisting simply in bricking up the surrounds of the local well and instilling nto the population a knowledge of water hygiene. The hospital cost thousands of pounds, whereas the water experiment did not cost a tenth of the money; yet he believed that the latter did more for the health and happiness of the people in that area.

Dr. HADEN GUEST agreed that health was not a matter of hospitals. Many of the large populations in tropical Africa were badly nourished and suffered from many diseases which were comparatively easily preventable. The Colonial Office ought to take its courage in both hands and make up its mind with regard to medical services. First of all it should recognise the impossibility of getting the doctors required to establish a medical service comparable to the National Health Service in this country: the doctors for such a scheme did not exist, and the Colonial revenues could not afford the cost. But an effort should be made to get a complete sanitary inspection of the whole tropical area with a view to prevention of disease. For example, the headquarters of leprosy in the world was Nigeria, and when he was there just before the outbreak of war he calculated that there were about a million cases, affecting some 5% of the population. Leprosy could be prevented from spreading by hygienic measures which could be carried out by a large staff of trained African sanitary inspectors: it would take a very long time to disappear, but if we began the work it could be done. The same applied to sleeping-sickness and malaria—sanitation was the real requisite. This was also true of tuberculosis, which was one of the chief diseases which affected workpeople once they began to live in houses and overcrowded townships. The housing conditions in many parts of Nigeria were excessively bad, and would not be tolerated anywhere in Europe. If we wished to have our Colonies properly developed we must promote a healthy population, and much of the work could be done by people who, though not medically qualified, could impose a system of hygiene and sanitation under the supervision of medical men.

Dr. H. B. MORGAN said he could not see any hope in Mr. Hall's speech that the Labour Party was making any new advance with regard to Colonial development. Welfare work and trusteeship were not enough. Had we not realised that these Colonial peoples were human beings, brothers of a different race and colour, but capable of great economic, cultural, and intellectual development, and could we not help them to go forward? Turning to the recommendations of the West Indies royal commission, Dr. MORGAN asked whether it was really correct to say that these islands were overpopulated. Was there not now a shortage of labour and were not an increasing number of people being taken to work in the United States, thus increasing the shortage? The commission had recommended that birth-control centres should be set up to teach uneducated women, whose wages were a shilling a day, how to control the increase in the population. But who was to pay for the condoms? We were trying to relieve the overpopulation in the West Indies by telling the people to do what could not be done even in this country. He was glad that a great improvement was being made in the training of West Indian nurses in British hospitals; but, because of malnutrition and want of vitamins, medical services and good hospitals and tuberculosis sanatoria were needed. We were still trotting along or marking time in the barrack square of Colonial development, and still doing the same old things we did fifty years ago, only now and again turning in a new direction.

Mr. CREECH JONES, under-secretary of State, in winding up the debate said that the problem of nutrition in the Colonial Empire was being seriously tackled and some substantial progress could now be recorded. The West Indian inquiry was going forward, and courses of training were also being arranged in West Africa in order to promote a better understanding of food values and dietary. It was hoped that within a short time a working unit would be sent out to West Africa to study the whole district.

New Towns Bill

In moving the second reading of the New Towns Bill in the House of Lords on July 11 the Earl of LISTOWEL, Postmaster-General, recalled that the Barlow report in 1940 quoted figures showing that the infant and general death-rates were higher in the large towns of England and Scotland than in the countryside, and gave as the main reason the disadvantage of growing up and earning a living in a densely populated area. London was the classical example of urban hypertrophy. Those who had served on the L.C.C. had been painfully aware of the evil effects of congested housing, lack of open space, and long distances between homes and places of employment. But the Barlow report did not say that the drift of population into the great cities with the worst health records was an inevitable consequence of industrial advance. On the contrary, it said that what was needed for the future was a planned and controlled development of town and country which would guarantee that industrial progress would not continue to be divorced from decent living conditions for the employed population. The Minister of Town and Country Planning had now decided on the first instalment of a long-range programme for establishing new towns of a moderate size. His immediate aim was the creation of some 20 new towns which would include large extensions of existing small towns in different places in England and Wales. The population of these towns would vary from 30,000 to 60,000 and they would provide homes for just over a million people. The Government wanted to see them grow into adult and independent towns, not into garden cities or satellite towns; they must not become dormitories for workers in a neighbouring city, or a salubrious suburban settlement governed from a distant town hall. The process of democratic local government, and the fact of living together in close proximity, would create in time a sense of civic pride, and a tradition of mutual helpfulness and public service that would be handed down by parents to their children. Secondly, the supervision of an enlightened public authority should ensure a fine and spacious layout of streets and buildings, and a harmonious and distinctive architectural style. There would be no excuse, under these auspices, for drab ugliness or chaotic jumble. Thirdly, the Government wanted prosperous communities with a good average standard of life, and immunity from recurrent bouts of large-scale unemployment. This meant building up a balanced and varied economy. The corporations could do this by the deliberate use of their powers to attract the right type of industry and commercial enterprise. Finally, they wanted a community free from the occupational and income snobberies of town life today. There must be no West Ends and East Ends, no suburban villas for the professional and black-coated workers and central tenements for the factory hands: each of the neighbourhoods into which the new towns would be divided would be planned as a cross-section of every occupational and income-group in the population. This Bill represented a great social experiment, and in a sense an act of atonement for our collective wrongdoing in the past. It was the biggest and most ambitious attempt at positive planning of environment that we had ever made.

Lord WESTWOOD, Lord-in-Waiting, explained the effect of the measure in relation to the problems of Scotland, where, he said, overcrowding, congestion, and slumdom both in housing and industry were probably without parallel anywhere else in the United Kingdom. In conditions like those of the Clyde valley neither the provision of new housing nor the provision of new industrial facilities could be secured unless the density of development throughout the region was substantially thinned out. That conclusion was fundamental to the Clyde Valley Regional Planning Committee's report to be published towards the end of this year. The committee recommended that four new towns should be established in the Clyde valley area. The actual sites proposed were East Kilbride, Bishopton, Houston, and Cumbernauld, and the Secretary of State had already announced that he had accepted the proposal as regards East Kilbride. Plans were now being worked out for the expansion and development of the new coalfields in the East of Scotland, in Fife, and the Lothians. These would provide employment for thousands of additional miners and their families, and there was every expectation that this area would become one of the most industrially prosperous areas in Scotland. The Secretary of State for Scotland was, however, determined that the mistakes of the past would not be repeated in the future. He was looking forward to new communities providing a wide range of industrial opportunity, and not deriving their character and livelihood solely from mining.

In the debate which followed, the aims of the Bill were generally welcomed, but some doubts were expressed as to whether the creation of new towns on a large scale at the present time might not result in diverting priorities from the urgent task of rebuilding the old towns which had been so badly damaged during the war. The Bill, however, was given an unopposed second reading.

Obituary

THOMAS IZOD BENNETT

M.D. LOND., F.R.C.P.

WE have already recorded the death in London on July 10, at the age of 58, of Dr. Izod Bennett, physician to the Middlesex Hospital and the Royal National Orthopædic Hospital and senior physician to Stoke Mandeville Hospital. He was a clinical investigator of a high order, with extensive knowledge and an incisive mind. Working with biochemists and physiologists in a long series of inquiries, he continually tried to put medical treatment on a rational basis, and by powerful expression of his opinions he did much both to stimulate thought and to raise the standard of practice.

Elliott & Fry

Bennett was born and brought up at Christchurch, New Zealand, but came to London as a student at Guy's. After qualifying in 1912, he held a house-appointment there; but the years 1914–18 were spent in war service, first as a regimental medical officer in France, and later as physician to a casualty-clearing station, also in the B.E.F. Returning to Guy's after the war, he became medical assistant and demonstrator in physiology, and took the M.R.C.P. In 1920, however, he moved to the Middlesex Hospital, where he was appointed assistant physician, and from 1921 to 1923 he held a Beit fellowship which enabled him to continue his first experimental work—observations on achylia and gastric and respiratory response to meals. Analysing his test-meals in the Bland-Sutton Institute, he found a fellow-student of gastric physiology in E. C. Dodds, with whom he was to collaborate during the next few years in valuable studies of gastric secretion, on the value of glucose given by mouth, and on œdema, where they had the help of J. D. Robertson. In 1925 he produced his book on *The Stomach and Alimentary Canal in Health and Disease*, a sound and timely work which revealed alike the author's physiological background and his familiarity with the work of dental, radiological, and surgical colleagues. He had clear ideas about the proper management of patients with peptic ulcer, and equally clear ideas about the inadequacy of the treatment most of them in fact received. A paper on lipoid nephrosis, written with D. T. Davies and Dodds in 1927, was followed in 1928 by the Goulstonian lectures at the Royal College of Physicians on three problems of nephritis—uræmia, œdema, and hypertension. He quoted with approval Bright's dictum that in the study of medicine we should cultivate a chastened power of generalising our ideas; he suggested that in nephritis "it is more than probable that the renal and extrarenal damage have a common cause"; and the lesson he taught was that of Sir William Gull when he said:

> "In this glass you see a large hypertrophied heart and a very contracted kidney. This specimen is classical. It was, I believe, put up under Dr. Bright's own direction and with a view to showing that the wasting of the kidney is the cause of the thickening of the heart. I cannot but look upon it with veneration, but not with conviction. I think with all deference to so great an authority that the systemic capillaries, *and, had it been possible, the entire man, should have been* included in this vase, together with the heart and the kidneys, and then we should have had, I believe, a truer view of the causation of the cardiac hypertrophy and of the disease of the kidney."

Though he was much more interested in some departments of medicine than in others, Bennett did in fact endeavour to look at the entire man—the patient and not merely his systems. He was at his best, perhaps, when dealing with a chronic disorder raising complex issues he could extract the important facts, sum up plainly and give good practical advice to both doctor and patient.

In 1934 he delivered lectures on Gee's disease at the Hôpital Claude Bernard in Paris—he was bilingual in French and English—and with Christopher Hardwick he produced in 1940 illuminating observations on "chronic jejuno-ileal insufficiency." Diabetes similarly attracted him, and he was quick to test, in 1936, with Morton Gill, the merits of protamine insulin. With the same collaborator he produced in 1939 useful evidence of the value of colloidal aluminium hydroxide as an antacid. He wrote in 1944, with Trevor Parkes, on penicillin in staphylococcal pneumonia, and for his presidential address to the medical section of the Royal Society of Medicine last year he chose the subject of hypertension. Of his more recent conjoint investigations perhaps the most important was the one begun in 1935 on cases of severe gastric and duodenal hæmorrhage admitted to the Courtauld research wards of the Middlesex Hospital. From this work Bennett, James Dow, Lee Lander, and Samson Wright emphasised in 1938 the value of estimating blood volume as a criterion of severity, and their second report, in 1942, described results of treatment.

"The outstanding point in Bennett's character," in the opinion of an old associate, "was the unpredictable nature of his outlook. He could always be guaranteed to take up some original and provoking line, and this made him a most attractive companion—though at times it could be distinctly annoying!" He was not considered an easy man to get on with, especially in later years; yet few hospital physicians have a fuller record of successful team-work. He had strong feelings, strong prejudices, and was apt to put things strongly on paper. A letter in 1924 effectively condemned *The Lancet* for encouraging the tendency to reckless abdominal operations for peptic ulcer; nevertheless Bennett was soon to be *The Lancet's* principal medical adviser, and his close relations with the editorial staff, by which the journal profited much during more than a decade, were remarkably happy.

As a physician, he was particularly good with patie[illegible] who had no money; and if they also had a grievance against a higher authority, then he was in his element. He would take great trouble and go to great expense to help someone whom he thought had been badly treated over a pension. On the other hand, he could treat wealthy and important patients with an aloofness that caused no little embarrassment to the doctors who had sent them. A colleague who was also a patient writes:

> "As a catchword spiritual healing may have its dangers, but it is a useful reminder that in times of illness the sensori-motor side of experience gives way to the deeper autonomic life of emotion—just as one little figure comes out and the other goes in on the popular Swiss weather-forecasting model. Izod Bennett was able to size up with a true insight what was wrong with his patients, and often showed a touch of gen[illegible] in putting them right again; but he lacked or despised the emotional appeal, and for that reason alone his private practice remained limited, albeit to the advantage of the questing hospital practice that brought him world-wide recognition

t pity it was; for on the other side of the rubicon, once ssed, was a tender care and selfless devotion that made the ofessional relationship a thing of rare content. For better for worse, sometimes to the point of obstinacy, his intellec- il honesty dominated his life. You might almost suppose at he liked climbing the lonely Avernus."

From 1929 to 1934 he was dean of the Middlesex ospital medical school. He had sympathy with his arges, as we see from the following characteristic ssage, saying that if we contemplate

> the hours of arduous work which confront the student, the ain upon his health which is involved, and the hazards which peril his ultimate success, the philosophy and good humour the medical student must give rise to admiration, particu- rly when these are contrasted with the grumbling and scontent which seem to prevail in the junior ranks of other ofessions."

n the other hand he was on the whole a better educator the graduate than the undergraduate. Those that orked with him later appreciated best his exceptional ualities. "We who owe much to his encouragement," rite A. M. G. and C. H., "would like to speak of that de of his character seen especially by those who knew im well":

> "These traits were his love of children, his kindness and mpathy to those who sought his advice, coupled with a enerosity and wisdom which were outstanding. Few men ossessed such an ability to grasp the essentials of a problem quickly and to provide a solution which was always prac- ical. Knowing as he did the inevitable outcome of his last lness, he nevertheless carried on his full activities, refusing o spare himself in any way. Few could have guessed how recarious was his health during the last year. This courage as typical of a man who was never afraid to defend his own pinions, however strong the opposition. At a time when the rofession is beset by so many difficulties the voice of such man can ill be spared."

Rightly or wrongly, Bennett was out of sympathy with he trend of these times. The "further steps towards slavery" have not been retraced since he wrote about some of them in these columns in 1935; and though he was a witty speaker, and could make a deep impression when he wished, in latter years his audience was apt to be out of rapport. It was something of a tragedy. At the beginning of the war he wrote: "If victory is not to be barren it must be shaped to encourage the individual rather than to produce general enslavement," and he was painting his own portrait when he spoke of the type of man who could not accept whole-time service—"whose individuality, restless energy, and imaginative vision bring not only technical knowledge but inspiration to patients and to students."

Mrs. Bennett, who survives him, is a daughter of the late N. Weiss, of the Société de l'Histoire du Protestantisme Française, in Paris.

Births, Marriages, and Deaths

BIRTHS

BELSEY.—On July 11, at Chesterfield, the wife of Mr. Ronald Belsey, F.R.C.S.—a daughter.

HANDLEY.—On July 7, in London, the wife of Mr. R. S. Handley, F.R.C.S.—a son.

KENYON.—On July 11, in Manchester, Dr. Marjorie Landau, the wife of Mr. R. H. Kenyon, F.R.I.C.—a daughter.

LATHAM.—On July 10, in Dorset, the wife of Surgeon Lieut.-Commander W. J. Latham, R.N.—a son.

LUND.—On June 20, at Hemel Hempstead, Dr. Elizabeth Lund, the wife of Mr. Max Lund, F.R.C.S.—a son.

MARRIAGES

DORNHORST—INNES.—On July 8, in London, Antony Clifford Dornhorst, M.D., M.R.C.P., to Helen Mary Innes, M.B., D.M.R.

DUGUID—BARRY.—On July 6, at Wallasey, John Duguid, M.B., major R.A.M.C., to Aileen Mary Barry, M.B.

SARGENT—SCOTT.—On July 4, Frank Sargent, M.D., M.R.C.P., D.P.M., of Reading, to Mary Margareta Scott.

STEVENS—RAWLINGS.—On July 2, in London, Albert Vivian Stevens, O.B.E., M.C., lieut.-colonel R.A.M.C., to Hilda Suzanne Rawlings.

DEATHS

BENNETT.—On July 10, in London, Thomas Izod Bennett, M.D. Lond., F.R.C.P., physician to the Middlesex Hospital and the Royal National Orthopædic Hospital, aged 58.

GOSSE.—On July 13, at St. Leonards-on-Sea, Hope Wilkes Gosse, M.B.E., M.R.C.S., formerly of Eccleshall, Staffs, aged 90.

LOUGHLIN.—On May 27, at Barton-on-Sea, Dermot Loughlin, D.S.C., M.B. Lond., late of Saxonhurst, Woolston, aged 60.

PARRY.—On July 8, at East Sheen, Evan Ithel Parry, L.R.C.P.E.

Notes and News

CHEMICAL SOCIETY'S CENTENARY

IN February, 1841, 25 men "interested in the prosecution of chemistry" met at the Society of Arts to consider "whether it be expedient to form a chemical society"; and the society, which was the first to be formed solely for the study of chemistry, came into being, under the presidency of Thomas Graham, the pioneer of colloid chemistry. Its record has been one of steady progress, the fellows increasing from the original 25 until today they now number over 6000. Offshoots have from time to time been given off, such as the Royal Institute of Chemistry, founded in 1877 to deal with the professional affairs of chemists, and the Society of Chemical Industry, formed in 1881 to cover industrial chemistry; some of these offshoots are again joined with the society in the Chemical Council. The centenary, the observation of which has been retarded by the war, will be celebrated in London in July, 1947; and the occasion receives world-wide recognition in the decision of the International Union of Pure and Applied Chemistry to hold its next international congress in London immediately afterwards.

MEDICAL SICKNESS SOCIETY

THE total funds of the Medical Sickness, Annuity, and Life Assurance Society have, in the past year, increased by £185,473 to £3,220,057. Mr. R. J. McNeill Love, the chairman, was able to report an expansion in the society's business at the annual meeting on July 16. In life assurance, new business at £270,048 exceeded by £45,208 that undertaken in 1944; claims by death and maturity amounted to over £80,000—a considerable, but anticipated, rise due to the abandonment, twenty-five years ago, of the friendly-society constitution. In the sickness fund, the premium income was £135,366, and claims paid amounted to £72,265—less than in 1944, although the amount at risk was substantially higher. Throughout the war life policies of members in the Services were generously interpreted; and payment was made on sickness policies, nominally confined to benefit within the United Kingdom, even if the member was serving overseas, when the incapacity was due to ordinary sickness or accident. The society, whose Holborn premises were destroyed by bombing, has moved from temporary offices in the country to a new permanent address at 7, Cavendish Square, London, W.1.

A NEW TYPE OF MATRON

THE Royal Victoria Hospital, Newcastle-on-Tyne, which advertised some months ago for a new type of matron,[1] has now appointed Miss Gertrude Lang-Davis, who trained at Bart's in 1923, and is technical nursing adviser to the Ministry of Labour. She is to be relieved by a catering superintendent and a housekeeper of all duties in connexion with the catering and domestic work of the hospital, and is to be free to concentrate on the nurses and their training. Moreover, she is expected to supplement her already wide experience of nursing in other countries by further travel abroad. We believe this new interpretation of a matron's duties will be rewarding not only to the hospital but to the whole nursing profession.

YOUR CUP OF TEA

THE Empire Tea Bureau, whose income is derived from a statutory levy on all teas exported from India and Ceylon, has opened at its new home, 22, Regent Street, London, W.1, a "tea centre" or exhibition illustrating the history of tea-drinking. To it M. André Simon, president of the Wine and Food Society, contributes a special display of tea-tables, complete with tea-services and cakes, showing the changes of style and fashion through the centuries.

JOURNAL OF TROPICAL MEDICINE

NEXT year the *Journal of Tropical Medicine and Hygiene*, which has been published bi-monthly during the war, will once again be a monthly. Dr. Harold Avery, who took over the editorship from Dr. Aldo Castellani in 1940 and has ably guided the journal throughout the war years, is now retiring, owing to pressure of other work, and is being succeeded by Dr. L. Everard Napier, C.I.E., F.R.C.P., who has returned home after nearly 30 years in the tropics, where he edited the *Indian Medical Gazette* and was director of the Calcutta School of Tropical Medicine. The annual subscription from January, 1947, will be 35*s.*; the editorial office remains at Staples House, Cavendish Place, London, W.1.

---

[1] See *Lancet*, 1946, i, 99.

University of Glasgow

The following degrees were conferred on July 10:

M.D.—James Reid (with honours); Margaret D. Giles (with commendation); D. M. Armstrong and James Macrae.

M.B., Ch.B.—G. C. Provan, J. F. Patterson, Elizabeth M. Dallow, John Guthrie, D. W. Menzies, J. B. Ritchie, R. W. L. Heddle, Susanne Rosenfeld, W. D. H. Conacher, Harold Stern (with commendation); George Adam, L. R. C. Agnew, C. M. Ball, G. N. Beck, W. G. A. Begg, Harold Benson, Ruth K. Bowden, Agnes C. L. Bowie, William Brodie, R. C. Brown, I. A. Buchanan, John Burgoyne, Janet G. M. Burnett, J. H. Cameron, F. W. Campbell, G. S. Carrick, James Carswell, Liam Casey, Nulece Cassells, Herbert Clark, Ruth A. Cohen, D. F. Coulter, Mary G. Coyle, A. J. Crowe, Helen M. Cunningham, Agnes C. Davidson, Andrew Deuchars, W. W. Douglas, Thomas Dungavel, A. M. Ferrie, G. H. Field, R. B. Forbes, R. R. H. Ford, W. S. Foulds, K. H. Fraser, William Garrett, J. B. Gibson, J. M. Gilmour, Agnes M. Gordon, Elsie R. Gordon, Catriona M. Gourlay, E. G. Green, Kenneth Greig, Anne M. Haddow, Samuel Happel, Ian Harper, Isabella P. Harvie, R. W. Henderson, R. B. Hendry, M. M. Herbert, P. A. Hood, J. R. S. Hutchison, R. M. Inglis, J. G. Kennedy, J. S. P. Kerr, Ruth A. Keymer, Margaret G. Kirkwood, William Lees, E. C. Levine, Jack Levy, Janet J. Logan, Thomas Logan, C. P. Lowther, Alexander McClelland, Sarah C. McEwan, A. J. Maciver, Samuel McKechnie, W. J. M. Mackenzie, N. A. MacKillop, J. M. McKinnon, John Mackintosh, D. A. McLaren, G. K. McLellan, J. F. McMinn, Anna S. MacTavish, A. S. MacVicar, J. S. Marshall, Robert Martin, Dorothy J. Miller, J. R. Milne, Mary A. Mullen, I. B. Munro, J. M. Neilson, Albert Poli, J. A. E. Primrose, Hugh Revill, H. A. N. Richmond, J. L. Robertson, J. S. Scott, W. J. C. Scott, William Seright, Margaret R. S. Smellie, Margaret A. E. Smith, Mary D. Smith, Marjory B. Snodgrass, J. T. T. Stark, Elizabeth T. Steel, I. F. Stewart, R. G. Stewart, *Jack Stoll, Norval Watson, Anne B. Watt, John White, Edith J. Whitelaw, Louis Whyte, Thomas Wilson, B. A. Woodger, J. T.* Young, and T. G. S. Young. The Brunton memorial prize and the Stockman medal were awarded to G. C. Provan; the West of Scotland R.A.M.C. memorial prize and the John W. Weir prize to Elizabeth M. Dallow; and the Macewen medal in surgery to R. W. L. Heddle.

Royal College of Surgeons of England

At a meeting of the council on July 11, Sir Alfred Webb-Johnson was elected president for the sixth year. Sir Heneage Ogilvie and Sir Cecil Wakeley were elected vice-presidents.

Leverhulme research scholarships were awarded to Mr. B. W. Rycroft (Surgery of Corneal Grafts) and Mr. David Barker (Recovery of Proprioceptor Function after Nerve Injury). The seventeenth Macloghlin scholarship was awarded to J. P. H. Davies of Lewes County School.

The following were elected for the ensuing year: *Hunterian professors:* Mr. Guy Blackburn, thoraco-abdominal wounds in modern war; Mr. R. H. Franklin, congenital atresia of the œsophagus; Mr. H. A. Haxton, regeneration after sympathectomy and its effects in Raynaud's disease; Mr. John Howkins, movement of the diaphragm after operation; Mr. Harvey Jackson, association between certain anatomical facts and the symptomatology of intervertebral disk protrusions in the lumbar region; Mr. J. B. Macalpine, (1) growths of the renal pelvis and ureter, and (2) bladder growths with special reference to growths occurring in workers in aniline dyes; Mr. Joseph Minton, occupational eye diseases and injuries; Mr. R. W. Nevin, surgical aspects of intestinal amœbiasis; Mr. H. W. Rodgers, postoperative course of gunshot wounds of the abdomen; Mr. E. R. Smith, intestinal decompression in the treatment of acute obstructions; and Mr. F. G. S. Strange, place of plastic procedures in the preparation of amputation stumps for limb fitting. *Arris and Gale lecturers.* Prof. Lambert Rogers, ligature of arteries with particular reference to carotid occlusion and the circle of Willis; and Mr. F. F. Rundle, anatomy of exophthalmos. *Erasmus Wilson demonstrators:* Mr. J. T. Chesterman, Mr. V. Zachary Cope, Dr. L. W. Proger, and Mr. R. W. Raven.

A diploma of fellowship was granted to J. R. M. Miller, and diplomas of membership to E. I. Bieber and Janet Sutherland.

Diplomas in Tropical Medicine and Hygiene were granted jointly with the Royal College of Physicians to the candidates named on June 29 (p. 987), and to E. A. Lumley. The following diplomas were also granted jointly with the Royal College of Physicians:

D.P.M.—W. V. Bremner, J. C. D. Carothers, G. S. Clouston, J. P. Dewsbery, L. A. Finiefs, Joan Fitzherbert, Max Hamilton, W. L. Hardman, H. B. N. Jennings, James Milne, E. W. Rees, A. P. Russell, Myre Sim, E. D. Taylor, Wilfrid Warren, R. L. Whitman, and H. G. Williams.

D.L.O.—Ronald Barraclough, J. C. Delap, H. D. Fairman, Sidney Gnessen, Kenneth Harrison, L. H. Hiranandani, T. B. Hutton, P. H. Jobson, R. S. McCrea, J. F. O. Mitchell, E. N. Owen, T. A. Quilliam, H. D. Raffan, Courtenoy Remington-Hobbs, J. A. Seymour-Jones, H. M. Urquhart, and L. E. Wood.

Dr. W. J. B. Burke, professor of medicine at the University of Santo Tomas, whose death in Manila was reported last year in these columns and in the lay press, is now known to be alive and well. His present address is: c/o Chartered Bank of India, Australia, and China, Manila.

On Active Service

AWARDS

M.C.

Captain Denys Rhys Evans, M.R.C.S., R.A.M.C.

In the list published on June 29 (p. 984) this officer was incor[illegible] described as Captain D. R. Evans, M.B. Edin.

MENTIONED IN DESPATCHES

Surgeon Lieut. A. W. Dawson-Grove, R.N.V.R.

Medical Diary

JULY 21–27

Thursday, 25th

Royal College of Surgeons, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. W. D. Coltart: Injuries of the Astragal[illegible] (Hunterian lecture.)

Appointments

Agnew, R. W., M.B. Glasg., M.CH.ORTH. Lpool, F.R.C.S.E.: [illegible]pædist, Blackburn Royal Infirmary, Blackburn public [illegible] dept., and Accrington Victoria Hospital.

Behrman, Simon, M.R.C.P.: neurologist, Queen Mary's Hospital [illegible] the East End, E.15.

Cooper, H. A., M.D. Lond., M.R.C.P: senior physician, [illegible] Hospital, Essex.

Couper, E. C. R., M.D. Glasg., F.R.F.P.S., D.P.H.: medical sup[illegible]intendent, Sharoe Green Hospital, Preston, and M.O., Prest[illegible] Institution.

Elliott, F. A., M.B. Cape Town, M.R.C.P.: asst. physician, Charing Cross Hospital.

Herring, Russell, M.R.C.S.: pathologist, Salford Royal Hospital.

Kimbell, C. W., M.B. N.Z., F.R.C.S.E., M.R.C.O.G.: asst. gynæcologist, Prince of Wales's General Hospital, N.15.

Rose, W. G., M.B. Lond., F.R.C.S.: honorary surgeon, Derbyshire Hospital for Sick Children.

Tod, W. H., M.D. Leeds, M.R.C.O.G.: consulting obstetrician and gynæcologist, Preston.

Ancoats Hospital, Manchester:

- Howat, H. T., M.B. St. And., M.R.C.P.: asst. physician.
- Jelly, G. O., B.M. Oxfd, F.R.C.S.: general surgeon.
- Smith, Reginald, F.R.C.S.E., D.L.O.: surgeon to E.N.T. dept.

Chelmsford and Essex Hospital:

- Johnson, R. S., M.D. Lond., M.R.C.P.: physician.
- Norman, H. B., D.M. Oxfd, M.R.C.P.: physician.
- Warren, C. B. M., M.R.C.P.: pædiatrician.

Institute of Child Health, University of London:

- Bonham Carter, R. E., M.B. Camb., M.R.C.P.: asst. to professor of child health.
- Illingworth, R. S., M.D. Leeds, M.R.C.P.: asst. to professor [illegible] child health.
- Roberts, J. A. Fraser, M.D. Edin., M.R.C.P., F.R.S.E.: lecturer in genetics (part-time).

Royal Liverpool United Hospital:

- Osborne, R. P., M.B. Manc., F.R.C.S.: asst. surgeon in charge of dept. of plastic surgery.

Royal Liverpool United Hospital (David Lewis Northern Hospital):

- Clarke, C. A., M.D. Camb., M.R.C.P.: asst. physician.
- Hunter, W. R., M.S., M.B. Lpool, F.R.C.S.: asst. surgeon.
- Jones, A. T., M.D. Lpool, M.R.C.P.: asst. physician.
- Mayer, S. G., M.B. Camb., F.R.C.S.: asst. surgeon.
- Thomas, G. E., M.CH.ORTH., M.B. Lpool, M.B. Lond., F.R.C.S.E.: asst. orthopædic surgeon.

Royal Liverpool United Hospital (Liverpool Royal Infirmary):

- Baker-Bates, E. T., M.D. Lpool, M.R.C.P.: asst. physician.
- Brewer, A. C., M.B. Lpool, F.R.C.S.: asst. surgeon.
- Jeffcoate, T. N. A., M.D. Lpool, F.R.C.S.E., F.R.C.O.G.: asst. gynæcological and obstetrical surgeon.
- Roaf, Robert, B.M. Oxfd, F.R.C.S., D.R.C.O.G.: asst. orthopædic surgeon.
- Silverstone, Maurice, CH.M. Lpool, F.R.C.S.: asst. surgeon.
- Sutton, W. S., M.B. Lpool, M.R.C.P.: asst. physician.

Royal Liverpool United Hospital (Liverpool Stanley Hospital):

- Evans, F. I., M.B.E., M.C., M.B. Camb., F.R.C.S.: asst. surgeon.
- Evans, R. M., M.B. Camb., M.R.C.P.: asst. physician.
- Mayeur, Mary H., M.D. Lond., F.R.C.S., M.R.C.O.G.: asst. gy[illegible]cological and obstetrical surgeon.
- Moroney, P. B., V.D., M.CH.ORTH. Lpool, F.R.C.S.: asst. [illegible]pædic surgeon.

Royal Liverpool United Hospital (Royal Southern Hospital):

- Bennett-Jones, M. J., CH.M. Lpool, F.R.C.S.: asst. surgeon.
- Doyle, R. W., F.R.C.S.: asst. surgeon.
- Hughes, R. R., M.D. Lpool, M.R.C.P.: asst. physician.
- Roberts, R. E., M.D. Lpool, F.R.C.P., F.F.R., D.M.R.E.: radiologist.
- Sanderson, Gerard, M.D. Lpool, M.R.C.P.: asst. physician.

Nutrition in South Africa.—In a letter to the *Times* of July 13, Dr. E. H. Cluver points out that two misconceptions have arisen in reports of his paper at the Royal Society Empire Scientific Conference (see *Lancet*, July 13, p. 67, second column, line 24). The figure 11,000,000 referred to the whole of the Union's population; there are only some 7,000,000 Africans. And even if the Africans could be in[illegible] to adopt a better balanced diet, it would not r[illegible] follow that the mines could recruit more labour locally, because many other avenues—particularly farming and the new secondary industries—are open to Union Africans.

EFFECTS OF USE AND DISUSE ON NERVE AND MUSCLE *

J. Z. Young
M.A. Oxfd, F.R.S.
PROFESSOR OF ANATOMY, UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE

The fact that the structure of the fabric of the body is modified by use is so familiar that we perhaps do not sufficiently often pause to consider how amazing it is. The self-preserving actions of the body are surprising enough in themselves, how much more so the fact that the living system is one in which each part increases or decreases in size according to the demands placed on it.

The facts of atrophy and hypertrophy have obtruded themselves throughout recent work on the regeneration of nerve and muscle, and we should like to know more of this subject if only to satisfy our intellectual curiosity. But there is another almost equally compelling reason for studying it—the great practical importance for the maintenance of the health of the body of those agents and actions which promote its growth and development. For the treatment of many disorders, as well as for the positive promotion of health, it is of first importance to have all the information possible on the effects of increased or decreased use of organs. There must be many who have regretted our ignorance of these effects as they condemned a joint to a fixed position in plaster, or examined a shrunken and rigid limb produced by weeks of fixation.

It is conventional to say that the early outlines of the body are moulded by heredity and the later details added by what W. Roux called functional differentiation. I have considerable doubts of the validity of this distinction. The influences of heredity and of function operate at both early and late stages. Indeed, they are not nearly so widely separate as might appear.

The essence of reproduction is the existence of a system which tends to build more like itself. By the terms function and use we mean activities of the parts which tend to preserve the whole. The fact of functional hypertrophy, the building of extra material into the system as a result of use, emphasises that reproduction does not stop with what is conventionally regarded as the end of development but continues throughout life. Since the activities of self-maintenance tend also to increase the amount of that which is maintained, it appears that heredity, growth, and functioning cannot be separated from each other.

These logical puzzles are instructive enough if we ponder them, but it is more important for us as scientists and clinicians to ask whether we understand the conditions under which hypertrophy and atrophy occur: the physiology of use and disuse. There have been some brave attempts by embryologists, but it would not be a great exaggeration to say that the subject has hardly been explored. And yet probably every one of our tissues —blood-vessels, muscles, bones, ligaments, skin, glands, and even as I hope to show nerves and brain—is continually being modified day by day through the use we make of them. Here is a vast field for research.

In considering the effects of use and disuse on muscle and nerve we should bear in mind that between receptors and effectors—sense organs, say, and muscles—there is a chain of tissues, afferent nerves, central pathway and cells, efferent nerves, and muscles. If we examine the circumstances in which each link in the chain undergoes hypertrophy or atrophy we shall, I hope, reach a useful generalisation about the conditions under which these processes occur.

PERIPHERAL NERVE TRUNKS

The change which one might at first regard atrophy is wallerian degeneration. Closer examination will show, however, that the degeneration of a portion of nerve-fibre severed from its nerve-cell body is not an atrophy *ex non usu* of the type that I wish to consider, it is the break-up of a balanced system whose physical integrity has been disrupted. However during the last two years evidence has appeared that use and disuse have large effects on peripheral nerve-fibres.

Influence of Peripheral Connexions.—The fibres in nerve trunks range in size from the large ones with a diameter up to 20µ or more, which are either motor fibres or connected with the annulospiral endings of the muscle spindles, through smaller sensory and motor fibres, down to the non-medullated sensory and post-ganglionic motor fibres. For each function there are fibres of an appropriate diameter. What determines the size of each fibre? The evidence now suggests that it is not some hereditary influence alone which does this but the connexions and activities of the fibres themselves. The peroneal nerve of the rabbit divides at the knee into motor branches to the anterior tibial and peroneal muscles and the purely cutaneous anterior tibial nerve. The motor branches contain many large and some small nerve-fibres; the cutaneous nerve has only medium-sized and small fibres. Now, if the main nerve trunk is severed high up in the thigh and the ends are reunited, the fibres originally connected with each part are bound to become mixed; for numerous fibres grow out from each central fibre, and there is no special attractive force which directs each back into its old channel. Yet, in spite of this mixing, after regeneration has continued for, say, a year, Sanders and Young (1944) found that the motor bundles contained larger nerve-fibres than did the cutaneous bundles.

This by itself suggests that the size of a regenerated fibre is not controlled by its cell of origin, unless we postulate that only those fibres which make correct connexions remain, while the rest atrophy. At first we were inclined to think that the determining factor was the size of the tube left in the peripheral stump of a nerve after degeneration. This tube, if small, may indeed have a restricting effect, but further investigation showed that the main influence was to be found more distally.

In this further work (Sanders and Young 1945) we interrupted the fibres of the common peroneal trunk high up in the thigh by crushing with smooth-tipped forceps. This operation produces wallerian degeneration but, if done carefully, leaves the main connective-tissue framework of the nerve intact. The new fibres which grow out from the central stumps are thus led back into their old pathways. Besides this crushing we severed the same peroneal nerves very low down at the knee, where they have already divided into motor and cutaneous branches. On one side of the animal we joined the ends again after severance, thus allowing the fibres to return to the muscles and skin. On the other side the stumps were so arranged that this could not happen, and the fibres, after traversing the region below the crush, were forced to end blindly in a neuroma.

The animals were killed 200 days after these operations, and the portions of the nerves between the crushed and cut regions were examined. Where union with the periphery had been allowed, large fibres had formed in the motor bundles and medium ones in the cutaneous bundles. But in the nerves which had regenerated below the crush, but had not been allowed to reach the periphery, the fibres were much more numerous, and all were small. Evidently what had happened was that, after the crush, numerous fibres had grown out from each central fibre down the tubes of the main peroneal trunk. When union with the periphery was allowed, some of these fibres matured and became large, while the superfluous ones disappeared altogether, thus producing nerves with a few large fibres. In the absence of any periphery the fibres remain almost equally small in both cutaneous and motor bundles. Here we have both hypertrophy and atrophy—hypertrophy of the fibres which become used, and atrophy of the superfluous ones in the same nerve. The totally useless nerves retained many small fibres.

---

* Sydney Ringer Memorial Lecture, delivered on March 12, 1946, at the University College Hospital Medical School.

The influence which determines the size of a nerve-fibre during regeneration is not therefore mainly the size of the tube in which it runs but the peripheral organ with which it makes connexion. Here we have a very striking example of the influence of the next most peripheral link in the reflex chain backwards upon the nerve. It may be that this influence is very potent in normal development in determining the size reached not only by nerve-fibres but also by the nerve-cells. Early in development all the neuroblasts are similar in size and the first outgrowing fibres are all small. It seems likely that the size which each fibre and cell ultimately reaches is determined by its peripheral connexion.

All sorts of questions about such an influence come to one's mind. The matter is not at all simple, since the relation between size and efficiency of nerve-fibres is obviously not a direct one. For some functions large rapidly conducting fibres, producing synchronous volleys of impulses, may be less efficient than small fibres in which the slow conduction leads to asynchronous arrival at the end-organ. It is not necessarily a case of "the bigger the better." We are now doing experiments to carry the analysis further and have found, for instance, that motor nerve-fibres become large on contact with any muscle and not merely their own muscle tissue. It is not therefore clear that effective functioning is necessary to allow the fibres to increase. But much further work must be done to determine how nervous tissue is influenced by its peripheral contacts.

Peripheral connexion of some sort is therefore necessary for the hypertrophy of peripheral nerve-fibres, and the reverse is also true: fibres which lose their peripheral connexions undergo considerable atrophy. Greenman (1913) showed that at certain stages of regeneration the fibres of the *central* stump of a severed nerve became smaller. This important finding has recently been confirmed by Weiss and his colleagues (1945) in America and by Gutmann and Sanders (1943) at Oxford. Gutmann and Sanders have found that, after severance and suture of a nerve, the central fibres decrease in diameter for about 100 days and then increase again, returning to normal after about 300 days. More recently, Sanders and Young (1946) have found that, if no connexion with the periphery is allowed, the secondary rise does *not* take place, and the fibres continue to shrink, becoming bizarre structures with very thin axon and thick myelin.

This brings us to a question which has often interested the neuropathologists—the disappearance of nerve-cells after severance of their nerve-fibres. It has long been known that there is a reduction in size of the ventral horn in the spinal cord at long periods after amputation of a limb. Retrograde degeneration of nerve-cells without a periphery may, in fact, extend to their complete disappearance. An interesting problem is how far this degeneration proceeds centrally. It may be that the Betz cells of the cerebral cortex are affected by the disappearance of the ventral horn-cells with which they were connected. It would be especially interesting to study such wider repercussions of atrophy and hypertrophy during the period of development.

Influence of Central Connexions.—There is evidence, then, that the tissues of the nervous system, both fibres and cells, hypertrophy under the influence of contact with the periphery but undergo atrophy if deprived of such connexions. But atrophy may take place under quite different conditions—namely, if the cells do not receive stimulation from above, a process known as transynaptic or transneuronal degeneration. After lesions in the retina the corresponding cells of the lateral geniculate body disappear, and there are indications that similar phenomena may be widespread in the central nervous system. However, it is certainly not true that any nerve-cell isolated from its normal source of stimulation rapidly disappears. The cells of the sympathetic ganglia, for instance, are known to persist when their preganglionic fibres have been cut. It would, however, be interesting to study such isolated ganglia in more detail to discover whether there is any reduction in the size or number of their cells.

Such tissues isolated from their central connexions show many changes, among which I may mention one which will throw some light on our general problem. They rapidly become hyperexcitable to mechanical and certain chemical stimuli. This applies to isolated nerve-cells of various types and to smooth and striped muscle-cells which have been denervated. The chemical sensitivity is especially pronounced to acetylcholine where this substance is normally the transmitter of impulses to the tissue. Denervated tissues are therefore usually not inactive but in a state of constant uncoördinated activity.

A brief analysis of hypertrophy and atrophy of nervous tissue has, then, shown that atrophy may take place in the absence of connexion with either the next higher or the next lower link in the normal chain of stimulus and response. Hypertrophy certainly takes place after connexion with a lower link, but no evidence has been presented that it can be induced by connexion from above, and no-one seems to have investigated this matter, though there are indications that it plays a part during the development of the nervous system.

MUSCLE-FIBRES

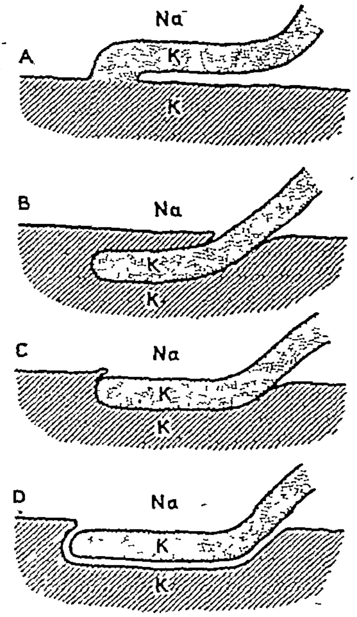
Connexions between Nerve and Muscle.—At this point we may examine some details of the connexion between nerve-fibres and muscle-fibres which are not only relevant to our subject but will also serve to recall certain aspects of the work of Sydney Ringer. He spent much of his time in analysing the content in inorganic ions of the body fluids and tissues and showed that a balance of ions similar to that which normally bathes the cells is necessary to maintain their life in vitro. Indeed in doing this work, which led to the invention of Ringer's solution, he came as near as almost anyone can to providing immortality for his name and fame. Consideration of the ionic content of the tissue fluids will go far towards helping us to obtain a clear picture of the nature of the relationship between nerve and muscle, a synaptic relationship similar to that between nerve and nerve. There has long been a controversy about whether the nervous units are continuous with each other or merely contiguous. If, as some have maintained, all the tissues are continuous, there is little sense in recognising separate links and all of the problems discussed above take on a new aspect. Ringer discovered that the fluid between the tissues was rich in sodium and chloride but contained little potassium ion. For this reason the minute channels round the cells in a muscle may be collectively referred to as the sodium space of the muscle. Within the cells, however, there is very little of either sodium or chloride, but there is much potassium, and this portion of the muscle may be called its potassium space. There is every reason to think that the maintenance of this ionic difference, by the activities of the cell and the nature of its surface, is of central importance for functioning and in particular for the propagation of action potentials in both nerve-fibres and muscle-fibres.

What, now, are the possible relations of a nerve-fibre with a muscle-fibre at the end-plate? Clearly, full continuity implies that the potassium spaces of the nerve and muscle are continuous, with no intervening membrane (see figure). It would be difficult for a histologist today to maintain that this is the situation. Where nerve and muscle meet, there is abundant evidence that the substances of the two are held apart. They usually stain so differently that there can be seen to be a clear boundary between the two, which we may take to imply the presence of one or more limiting layers or membranes (Gutmann and Young 1944).

But, even if there is a separation, there are still various possibilities. The nerve and muscle may each have membranes continuous over their surfaces and with a portion of the sodium space separating the two; or the two membranes, still complete, may be in contact, with no intervening space. Finally, there may be, in some sense, a fusion of the two membranes to make one. It should be possible to decide between these alternatives by histological means, though I am not at present prepared to be dogmatic about it. The incoming nerve-fibre lies in a trough in the protoplasm of the sole-plate of the muscle-fibre, with a narrow clear space often visible round it. This suggests that either alternative C or D (see figure) is true. In a lateral view one can often see a separation between nerve and muscle, suggesting D; but it must be remembered that such material has been not only fixed and stained but also deprived of the water which makes up at least 70% of its substance; hence shrinkage would be expected, and no great reliance can be placed on small spaces seen in such preparations.

Denervation Atrophy.—In any case there is a sharp boundary between the nervous and muscular tissue; and, if we divide the nerve, the acute degeneration of the nerve-fibre stops at the endings in the muscle. The end-plate does not, as is often stated, disappear (Gutmann and Young 1944). Nevertheless such a denervated muscle undergoes a rapid and dramatic atrophy. Within a few days the muscle-fibres begin to shrink and the connective tissue between them to increase. This process goes on at different rates in different muscles and in different animals, but it leads within a few weeks to a reduction of the total volume of the muscle to less than a half, and of the muscle-fibres by much more than this. The nuclei leave their position at the margin of the fibres to form rows at the centre, and finally, after months or years, the whole muscle-cell splits up either by longitudinal fission into short spindle-shaped fragments or by rounding up into spherical or ovoid sections (Gutmann and Young 1944). Well-marked chemical changes accompany this process of atrophy, especially a fall in the glycogen and phosphocreatine content, but these changes might be expected to accompany loss of muscle substance. So far knowledge about them has added little to our understanding of the process of atrophy. The contraction which the muscle gives when electrically stimulated is much prolonged after denervation, but again we

evidence of the significance of this.



Conceivable relations of nerve and muscle at an end-plate: A, complete continuity of axoplasm and sarcoplasm; B, nerve-fibre penetrates muscle membrane and runs within sarcoplasm; C, nerve indents sarcoplasm, and membranes of nerve and muscle fuse; D, nerve indents sarcoplasm, and membranes of nerve and muscle remain distinct, leaving a Na space all round nerve. Actual relations are either C or D. (Gutmann and Young 1944.)

Deprivation of a muscle of stimulation from a therefore leads to shrinkage and, finally, disappearance of its fibres. But there is another way in which atrophy can be produced. The next link downwards in the chain of reflex action is the resistance which the muscle meets by acting against other muscles, or the hard outside world. Deprive a muscle of this resistance and it will waste almost as fast as if denervated. An easy way to do this is to cut its tendon: after section of the tendo Achillis the gastrocnemius of the rabbit becomes reduced in weight by a half in three weeks. Immobilisation by splinting or plaster is nearly as effective in producing atrophy of a muscle which is held relaxed. Muscles held moderately stretched during splinting, on the other hand, do not atrophy and may even hypertrophy, though overstretching is a potent source of damage to muscle.

The theories of the causes and nature of muscular atrophy are numerous, but none is conclusive. It has already been mentioned that the denervated tissue is hyperexcitable and its fibres go into that continuous ineffective flickering contraction which is known as fibrillation. Many have suggested that it is this activity which causes the wasting, that atrophy is a result of overactivity rather than underactivity—overactivity in the absence of the usual vascular responses of the muscle. But there is much to show that fibrillation is not the cause of atrophy. Quinidine, which prevents fibrillation, does not arrest the wasting (Solandt and Magladery 1940).

There are means, however, by which denervation atrophy can be reduced if not entirely prevented. John Reid, of Edinburgh, 100 years ago described the beneficial effects of galvanic treatment of denervated muscles, and this has recently been confirmed. Gutmann and Guttmann (1942), Hines et al. (1943), Eccles (1944), and Solandt et al. (1943) have found in animals that electrical exercise maintains the volume of denervated muscles. We do not know how this effect is achieved, but we may notice that the treatment is in effect restoring to the muscle something of its normal action. This may seem a trite piece of teleology, but it is suggestive that when the muscle-fibres are made to contract, as they normally are by stimulus from outside themselves, they waste little if at all. The atrophy of muscles in splinted limbs may similarly be at least partly prevented by encouraging strong voluntary contractions daily, if this can be arranged.

We may expect further enlightenment from the study of the way in which various conditions of tension influence the extent to which atrophy is prevented when denervated muscles are thus made to contract. Strangely enough, this factor has until recently been largely neglected in most of the studies. The work of Eccles (1944) suggests that denervated muscles waste least if allowed to shorten during electrical stimulation. Wehrmacher et al. (1945) found the greatest effect when the muscles were subjected to the maximal stretch and restrained by weights so as to prevent shortening. It seems probable that the optimal conditions for the maintenance of muscle-fibres is that they contract against resistance and, if allowed to shorten, are then again stretched. In fact, it seems that the atrophy of the denervated muscle is connected with the fact that it is not made to do its proper work.

Hypertrophy of Muscle.—This can of course be produced by reinnervation of a denervated muscle. The time of arrival of new nerve-fibres at a muscle after nerve suture can now be calculated accurately. If the muscle has not been left for long without nerve-fibres, the power of contraction reappears and the volume of the muscle begins to increase within a few days of the return of the nerve-fibres to the old end-plates. The original pattern of innervation may then be fully restored. But in muscles left for a long time without nerves the old connexions between the nerve and muscle become broken or closed by the development of fibrous tissue, so that the new nerve-fibres cannot enter into the old end-plates; instead they pass along between the muscle-fibres (Gutmann and Young 1944). If they then eventually make contact with the sarcoplasm new end-plates are formed, of unusual form but apparently effective in inducing contraction and increase of volume of the muscle-fibres. It is striking to see how even a very wasted muscle may recover in volume and produce strong actions. But the further the atrophy has gone the slower and less complete will be the recovery, and muscle-fibres which have broken up can probably never again differentiate. This is one of the main reasons for urging that performance of nerve suture be not delayed longer than is absolutely necessary after nerve injury. In the past it has been common to leave injured nerves for long periods in the hope of a spontaneous recovery. But every month of delay decreases the probability of a good eventual recovery, and it is therefore obviously of great importance to obtain as much information as possible about the rate of regeneration so as to estimate accurately the date at which recovery may be expected and, if it does not take place, to allow operation and union of the nerve stumps.

We must be careful not to refer the hypertrophy which follows reinnervation too definitely to the restoration of the muscle to use by the animal. Muscles recover their volume when innervated by nerves which do not normally control them, even by the nerves of the antagonistic muscles. In these circumstances the very careful work of Sperry (1942) has shown that there is no re-education of the central neurons to allow effective use to be made of muscle. Presumably, in so far as it contracts at all, such a hetero-innervated muscle does so ineffectively, but it may meet resistance. Yet its volume increases, though not so fast or far as a muscle with its own innervation. Evidently the mere presence of nerve-fibres stimulates growth of a muscle (as any muscle stimulates any nerve). Further work is needed to decide the extent of such direct effects of mere contact between nerve and muscle as distinct from those of the activity produced by the connexion. Immobilisation of any region by transection of the spinal cord and section of the posterior roots is followed by an atrophy of the same order of severity as that produced by denervation, which suggests once again that inactivity is the main if not the whole cause of the atrophy.

In fact the importance of activity of the muscle continually obtrudes throughout these studies, though it has only recently become a main preoccupation of the experimenters. We have already seen that it is probable that active contraction against resistance will prevent the atrophy of denervation. Now Hines (1942) has shown that the recovery of a muscle during reinnervation is much reduced if the limb is immobilised. It would be difficult with present knowledge to assert that activity is the only factor in the hypertrophy of reinnervation, but it is certainly a very large one; within limits, the more use is made of the muscles through their nerves, the larger do they become.

This brings us to the problems of hypertrophy and exercise. We are all familiar with the development of the muscles with use, but there is a surprising lack of information about the conditions under which it takes place. The hypertrophy does not consist in an increase in the number of muscle-fibres but in the volume of those already there. The smaller muscle-fibres constitute, as it were, a reserve able to provide an increase when the muscle is exercised. The hypertrophy is no doubt related to the increase of blood-supply which accompanies increased activity, but the general conclusion which emerges is that muscles waste when they are deprived of stimulation from above or of resistance from below, and in this double dependence they show a remarkable parallel with nervous tissue.

SENSE ORGANS

Specialised receptor cells atrophy and may disappear if isolated from the central nervous system by section of their nerves. As in the case of muscle-cells, the disappearance is not always rapid, but it has been stated to happen in various situations, such as taste-buds, lateral-line organs of fishes, muscle spindles, and Merckel's corpuscles of the skin. Conversely, réinnervation of a degenerated piece of skin is said to lead to the redevelopment of the atrophic sense organs within it and to the addition of new ones. Sense organs therefore undoubtedly may undergo atrophy if deprived of connexion with the next link down the chain of reflex stimulation.

The link which precedes the sense organs in that chain is the stimulus arriving from the outside world. Studies on the effect of absence of outside stimulation on sense organs are not numerous, but they are sufficient to indicate that a process comparable to atrophy may take place, for instance, in the eyes or in the skin, if these are isolated by appropriate means from external changes. The subject would well repay further investigation, especially of the influence of various external environments during development. Though our information about sense organs is very incomplete, it justifies the statement that they too depend for their continued existence both on activation from above and on the possibility of transmitting downwards to the rest of the body.

THE PRINCIPLE OF DOUBLE DEPENDENCE

My survey of the factors making for atrophy or hypertrophy of the sections of the neuromuscular system is now complete, and I hope that it shows a general principle. The tissues concerned are all triggered systems, having the power of acting in a certain way for the good of the body as a whole. The continued existence of each of the tissues is ensured by a system of double dependence. They must receive some stimulus or constraint from above, and they must exercise some stimulating effect or be able to produce some constraint below. Thus a nerve-fibre deprived of connexion either with its periphery or with its centre fades and may disappear. Muscle receives its stimulation from nerve and exercises constraint against other muscles or outside forces. It will atrophy if given too little direction from above, as after total denervation or isolation of lower from upper neurons; it will also atrophy if it is left relaxed and therefore cannot contract against resistance. Conversely, hypertrophy arises when a muscle is worked harder either from above by the nervous system or from below by meeting increased resistance. The development of any of these organs also depends on its blood-supply, and I might add this as a third factor and say that the tissues show a triple dependence; but the supply of raw materials is so universally a necessity for living tissues that I prefer not to include it with the other two special conditions on which atrophy or hypertrophy depend.

This principle of double dependence may seem pretentious, teleological, and without practical value, but it can be defended *against* all three counts. It accurately describes the facts and therefore makes no unjustifiable pretences. This does not mean that it describes all possible information about atrophy and hypertrophy. I should be the first to agree that we need further physiological analysis of the changes in the metabolism, and so on, which are involved. But such studies will not alter the fact that hypertrophy arises when tissues are able so to act as to assist the life of the body, and that they atrophy if they cannot be of further use. I can see no objection to organising our ideas on the subject round this fact; it might be called a truism were it not so widely neglected. And to the charge that the statement

the double dependence of tissues is of no practical
lue it can be replied that it may be of service to many
arranging their knowledge so as to be better able to
eat their patients. For it will continually remind us
the circumstances in which atrophy and hypertrophy
ay take place, and may even suggest means by which
tissue, in danger of wasting because deprived of depen-
ence on one side, may be maintained by increased
imulation from the other direction.

However, the last thing I wish to suggest is that our
nowledge on this subject is yet satisfactory. Indeed,
felt that the most appropriate memorial to Sydney
inger was to use this occasion to call attention
o a subject about which our information is incomplete.
here is still plenty to do in analysing the conditions
hich produce increase or decrease of parts of the body
uring development and in adult life. It may be that
e shall find that we can organise our search for know-
edge of the subject round the thesis that each tissue
ends to produce more like itself, provided that it has
uitable raw materials, when it comes under a system
f double constraint—namely, when it is stimulated
rom outside and can produce effects of value to the
ody as a whole.

REFERENCES

Eccles, J. C. (1944) *J. Physiol.* 103, 253.
Greenman, M. J. (1913) *J. comp. Neurol.* 23, 479.
Gutmann, E., Guttmann, L. (1942) *Lancet*, i, 169.
— Sanders, F. K. (1943) *J. Physiol.* 101, 489.
— Young, J. Z. (1944) *J. Anat.* 78, 15.
Hines, H. M. (1942) *J. Amer. med. Ass.* 120, 515.
— Thomson, J. D., Lazere, B. (1943) *Arch. phys. Ther.* 24, 69.
Sanders, F. K., Young, J. Z. (1944) *J. Physiol.* 103, 119.
— — (1945) *Nature, Lond.* 155, 237.
— — (1946) *J. exp. Biol.* (in the press).
Solandt, D. Y., Magladery, J. W. (1940) *Brain*, 63, 255.
— de Lury, D. B., Hunter, J. (1943) *Arch. Neurol. Psychiat.* 49, 802.
Sperry, R. W. (1942) *J. comp. Neurol.* 76, 283.
Wehrmacher, W. H., Thomson, J. D., Hines, H. M. (1945) *Arch. phys. Med.* 26, 261.
Weiss, P., Edds, M. V., Cavanaugh, M. (1945) *Anat. Rec.* 92, 215.

PENICILLIN SENSITIVITY OF BACT. TYPHOSUM

R. WINSTON EVANS
B.Sc. Lond., M.R.C.S.

LATE MAJOR R.A.M.C., O.C. MOBILE (PENICILLIN) BACTERIOLOGICAL LABORATORY; HÆMATOLOGIST, CHRISTIE CANCER HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER

SIXTY-SIX different strains of *Bact. typhosum* were tested in tubes containing falling dilutions of penicillin in nutrient broth. The tubes were inoculated from broth cultures 24 hours old with a standard 2 mm. platinum loop. Readings were made after 24 hours' incubation.

With one exception all strains were completely inhibited by 25 units of penicillin per c.cm.; sixty-three by 20 units per c.cm.; and 15 units per c.cm. was sufficient to inhibit completely the growth of fifty strains of the organism as judged by absence of turbidity in broth. Thirty-six of the strains were totally inhibited by 10 units of penicillin per c.cm. The lowest concentration of penicillin used—2·5 units per c.cm.—did not completely inhibit any of the test organisms, but retarded growth in twenty-eight strains.

For the purpose of demonstration a strain of *Bact. typhosum* was plated out on a buffered medium, and its sensitivity tested by the assay cylinder method[1] with porcelain cups 8 mm. in diameter. The zones of inhibition obtained round the cups containing penicillin in increasing concentrations were 0, 9·0, 12 0, 14·5, 16 5, and 19·0 mm., corresponding to concentrations of 5, 10, 20, 80, 160, and 320 units of penicillin per c.cm.

TABLE I—ANTIBIOTIC EFFECT OF PENICILLIN ON *Bact*
IN MICE

Test animal	Dose of penicillin per injection (units)	No. of injections	Result or interval from inoculation to death
A	50	1	20 hr. 30 min.
B	100	1	Recovered
C	200	1	31 hr. 50 min.
D	400	1	47 hr. 30 min.
E	800	1	39 hr. 00 min.
F	50	3	Recovered
G	100	3	15 hr. 30 min.
H	200	3	21 hr. 30 min.
I	400	3	31 hr. 30 min.
J	800	3	Recovered
K	50	6	Recovered
L	100	6	Recovered
M	200	6	Recovered
N	400	6	50 hr. 30 min.
O	50	8	Recovered
P	100	8	Recovered
Q	200	8	Recovered
R	400	8	Recovered
S	800	8	19 hr. 30 min.

14 control animals: 12 died in 14–33½ hr., and 2 recovered.

The results described suggest that the rate of growth of *Bact. typhosum* is retarded by penicillin. Unfortunately no suitable animal is known for the experimental study of typhoid fever in the laboratory. Mice are easily killed by the intraperitoneal inoculation of virulent typhoid bacteria, and an attempt was made to study the antibiotic effect of penicillin on *Bact. typhosum* in these animals.

A B1 phage type was used which was partially inhibited by a concentration of 5, and completely by 10, units of penicillin per c.cm. Its virulence was increased by repeated passage until 50,000,000 organisms inoculated intraperitoneally killed a mouse weighing 25 g. within 24 hours.

Mice were given an intraperitoneal inoculation of 50,000,000 organisms. After 10 minutes five of the animals were injected subcutaneously with a solution of penicillin, each mouse receiving one injection only. Another series of five animals were given half-hourly subcutaneous injections of penicillin for three doses, each course starting 30 min. after an intraperitoneal inoculation of 50,000,000 of the test organism. Four more animals were given six half-hourly subcutaneous injections of penicillin, and a further five mice were given eight half-hourly subcutaneous doses of penicillin, each course starting 30 min. after inoculation with the standard number of the typhoid organisms. The doses of penicillin were arranged in parallel in amounts of 50, 100, 200, 400, and 800 units, so that the mice in each series received either one, three, six, or eight doses each of 50, 100, 200, 400, or 800 units.

An additional fourteen animals were inoculated with the organism and distributed as controls in the four experiments. Positive cultures were obtained from all the animals which died. The results are shown in table I.

DISCUSSION

Conclusions based on so few experiments would be misleading, but the results suggest that a retarding effect is exercised by penicillin on the rate of growth of *Bact. typhosum* in vitro and in vivo. In the test-tube experiments a concentration of over 8 units per c.cm. was necessary to inhibit most of the strains. Only a few were completely inhibited by lesser concentrations.

The results in the animal experiments also seem to indicate the same retardation of growth of the organism as judged by the time taken to kill standard mice inoculated with a constant dose of the same strain of bacterium, the penicillin-treated animals taking longer to die. An interval of 15½–50½ (average 31) hours before death was recorded for these animals, whereas the control animals were killed in 14–33½ (average 20) hours. The distribution of the results round these averages is almost equal, four out of the nine penicillin-treated animals dying in the shorter time, as compared with seven out of twelve control animals which died in a time shorter than the average. Only two of the penicillin-treated animals died in less than 20 hours after inoculation, which is the average figure recorded for the death of the controls.

---

[1] Abraham, E. P., Chain, E., Fletcher, C. M., Gardner, A. D., Heatley, N. G., Jennings, M. A., Florey, H. W. *Lancet*, 1941, ii, 177.

The recovery-rate is greater (ten out of nineteen, or 53%) in *those animals* which were given penicillin than in the controls (two out of fourteen, or 14%). The difference becomes even greater if the animals which received only one injection of penicillin are not taken into account: nine out of fourteen (64%) of the treated animals recovered.

The inconsistency in the results as indicated by the recovery of two of the control mice cannot be explained unless by some unknown technical error, and it is again emphasised that conclusions cannot be drawn, and that the comments on the results are suggestions for further investigation.

TABLE II—BLOOD-PENICILLIN LEVELS IN MICE

Dose (units)	Titres at hourly intervals					
	1	2	3	4	5	6
800	1/128 1/256*p*	1/16 1/32*p*	.. 1/2	.. 1/2	.. 0	.. 0
400	1/32	1/4	1/2	1/4	1/4	1/4
200	1/2	1/2	1/2	0	1/2	1/2
100	1/2	1/2	1/2	1/2	1/2	0
50	1/1 1/2*p*	1/1 1/2*p*	1/1 1/2*p*	.. 0	.. 1/1	.. 0
Five half-hourly injections of 800 units	1/1024	..	..	..	..	..

p=partial inhibition.

At present there is no specific treatment for typhoid fever. If penicillin should prove useful in this disease, much would have been done to reduce the present mortality. It might be argued that the concentrations of penicillin, as judged by the results obtained in these laboratory experiments, necessary to produce an inhibiting effect are far too high. American workers[2] have shown that, by exhibiting penicillin in combination with the buffer salt tri-sodium citrate, a peak blood-penicillin level of 8 units per c.cm. was obtained even after oral administration of calcium penicillin. Table II shows the blood-penicillin levels obtained in mice after one subcutaneous injection of different quantities of penicillin and the blood-penicillin level in one mouse an hour after the last of five half-hourly injections of 800 units of penicillin.

SUMMARY

The sensitivity of sixty-six strains representing sixteen different phage types of *Bact. typhosum* has been examined. There was a considerable variation in sensitivity which was independent of the phage type. Most of the organisms required 5–10 units of penicillin per c.cm. to inhibit their growth for twenty-four hours.

The inhibitory effect of penicillin was also investigated in mice inoculated intraperitoneally with virulent typhoid organisms. Retardation of growth of the organism was recorded as judged by the longer time taken before death and the higher recovery-rate of penicillin-treated animals.

I am grateful to Brigadier J. S. K. Boyd, C.B.E., director of pathology, War Office, for supplying me with cultures and typing phages; Major K. E. A. Hughes, M.B.E., R.A.M.C., for working out the blood-penicillin levels; and Private J. E. A. Biggs, R.A.M.C., for technical assistance.

---

[2] György, P. *J. Amer. med. Ass.* (in the press).

SULPHATHIAZOLE AND PENICILLIN IN TYPHOID FEVER

REPORT OF SIX CASES

C. J. McSweeney
M.D. N.U.I., F.R.C.P.I.
MEDICAL SUPERINTENDENT, CORK STREET FEVER HOSPITAL, DUBLIN

In consequence of Bigger's[1] researches on the combined action of sulphathiazole and penicillin on *Bact. typhosum*, it was decided early in 1945 to treat with both drugs every severe case of typhoid fever admitted to Cork Street Fever Hospital. The treatment was reserved for those cases considered likely to prove fatal if dealt with in the orthodox fashion. Up to February, 1946, five cases (representing all the severe infections admitted during the period) were given sulphathiazole and penicillin. Four of these were bacteriologically proved by the culture of *Bact. typhosum* from the blood, and the fifth was clinically enteric with strongly positive Widal, and *Bact. typhosum* was isolated from fæces and urine.

At the start of this investigation (May, 1945) we had no guide to what might prove to be an effective system of dosage, and the first case of the series was given what we now regard as an inadequate amount of penicillin. *Bact. typhosum* is not a penicillin-sensitive organism in the usual sense of the term; but, as Bigger has recently shown, large doses of penicillin and sulphathiazole inhibit its growth. An exceptionally high concentration of the drugs in the blood must be maintained for four, five, or more days. In the first case of the series five penicillin-sulphathiazole courses were spread over as many weeks. *As we learnt a lot from this* case, I am giving it in some detail.

CASE 1

A girl, aged 16 years, admitted on May 7, 1945, on the 7th day of typhoid fever, presented all the classical signs: exceedingly toxic and drowsy, with a dry fissured tongue; temperature 102·8° F, pulse-rate 122, respirations 26 per min.; blood-culture, fæces, and Widal reaction positive for *Bact. typhosum* (serum agglutinated *Bact. typhosum* "H" strongly in dilutions of 1/250 but did not agglutinate "O" in dilutions from 1/8 to 1/250).

During the week after admission the patient's condition steadily deteriorated. The temperature showed very slight remissions, tending to be of the continuous type, a level of 102° F being maintained with a pulse-rate averaging 120 (fig. 1). During this period the patient had repeated epistaxis, exhibited subcutaneous bruising on chest and limbs, had frequent incontinent motions, and was steadily drifting into the "typhoid state."

On the 14th day of disease she had hæmaturia, hæmoptysis, and intestinal hæmorrhage, and her condition was critical. It was clear that this was a hypertoxic or hæmorrhagic typhoid. She had received 20 c.cm. of Felix's antityphoid serum each day since admission without any apparent benefit. Her blood-culture was still positive for *Bact. typhosum*, and it was decided to put her on sulphathiazole and penicillin. In the first course 40,000 units of penicillin was given intramuscularly every three hours, until 2,000,000 units had been given. Simultaneously, sodium sulphathiazole 1 g. was given intravenously, followed by 1 g. in tablet form by mouth every four hours between the 15th and 21st days of disease.

Definite improvement in the clinical condition was noted on the 22nd day; and, though the temperature showed no sign of settling, there was no severe toxæmia thereafter. The patient was reading a picture paper on the day after the first course was completed. But the blood-culture taken on the 21st day was positive, fresh rose spots appeared, and the temperature reached 102° F again on the 24th and 25th days.

It was evident that relapse was developing, and a second course of penicillin and sulphathiazole was started on the 25th day, the dosage being the same as before—*i.e.*, penicillin 40,000 units intramuscularly every three hours and sulphaazole 1 g. by mouth every four hours. This course of 00,000 units ended on the 28th day, but the blood was l positive for *Bact. typhosum.*

---

[1] Bigger, J. W. *Lancet*, 1946, i, 81.

n spite of the fact that the temperature was still high, ient remained bright and cheerful, quite unlike a fourth-ek typhoid. On the 32nd day the blood-culture was again sitive (as were the fæces), and another course similar to the t was given.

The temperature was now varying from 100° to 101° F, d the patient was asking for food. This course was finished the 35th day, and the blood-culture was again reported sitive. On the 39th day yet another crop of rose spots peared, and a second relapse began, the patient's evening mperature rising steadily each evening until it reached 3·4° F on the 43rd day.

Two further courses of penicillin and sulphathiazole were ven—one of 1,000,000 units from the 39th to the 42nd y, and the second of 2,000,000 units from the 44th to the th day. The sulphathiazole dosage was the same as before, it in the last course the penicillin dosage was increased to 0,000 units three-hourly. Altogether 7,000,000 units of enicillin was given in five courses, comprising 2,000,000, 000,000, 1,000,000, 1,000,000, and 2,000,000 units.

Even after the end of the *last* course the *blood-culture still* mained positive. In spite of this the patient was not toxic, e stools became formed, and the temperature slowly sub-ded. A blood-culture taken on the 56th day was negative, s were the stools and urine. Convalescence was slow because f a carditis, which eventually cleared completely. Because f the protracted pyrexial period wasting was very con-iderable, and we kept her in hospital until Sept. 25, when she as discharged apparently well.

This case was disappointing in the persistently positive lood-cultures after what we at that time thought vas intensive penicillin and sulphonamide therapy. It vas clear that the drugs were not present in the blood n sufficient quantity to sterilise it, and it was decided o give much larger dosage to subsequent cases. In one way only the case was encouraging. There could be no question that toxæmia was considerably lessened all through this long fever after the first course of the drug, and there were no complications due to ulceration.

CASE 2

A woman, aged 40, admitted on Sept. 18, 1945, on the 6th day of her disease, had the usual clinical evidence of enteric fever, and her blood-culture was positive for *Bact. typhosum.* She was rather stout and flabby and was not a good subject for enteric; temperature 102° F, pulse-rate 108, respirations 34 per min.

When her blood-culture was reported positive on the 10th day she was given sodium sulphathiazole 2 g. intravenously and then 1 g. three-hourly by mouth for four days. During the same period she was given penicillin 200,000 units intramuscularly two-hourly. During the four days she received sulphathiazole 34 g. and penicillin 10,000,000 units.

The effect was very remarkable. When she started her course of treatment she had a *morning* temperature of 101° F, pulse-rate 124, and respirations 30 per min. Her stools were liquid, and fresh rose spots were appearing. When she finis the course four days later (14th day) her *evening* temperatur was normal, pulse-rate 90, respirations 22, and her stools were formed. In a subject with evening temperatures of 102° F before treatment this is a very unusual happening on the 14th day of an attack of typhoid. Blood-culture at the end of the course was negative. The note made next day (15th day) was: "Patient feels well enough to get up, she says, and is wanting food." She was very bright and not complaining. Her stools were normal.

A second course exactly similar to the first was given between the 16th and 20th days—i.e., penicillin 10,000,000 units and sulphathiazole 34 g. The temperature finally settled before the end of this course (19th day) and remained normal thereafter. Blood-culture on completion of the course was negative, and five samples of fæces and urine taken subsequently were negative. A blood titration carried out by Prof. J. W. Bigger during the course of treatment showed that the concentration of penicillin in the blood was 2 units per c.cm., and of sulphathiazole 4·5 mg. per 100 c.cm.

CASE 3

A man, aged 47, admitted on Oct. 3, 1945, on the 15th *day of disease,* was a bad subject in that he was of very poor physique and had chronic bronchitis and emphysema. His mouth and teeth were septic. Blood-culture was positive for *Bact. typhosum*; temperature 103° F, pulse-rate 102, respirations 28 per min.

He was put on exactly the same treatment as case 2—i.e., two courses each of penicillin 10,000,000 units with sulphathiazole 34 g. spread over four days, the interval between the two courses being two days. During each course 200,000 units of penicillin was given every two hours intramuscularly and 1 g. of sulphathiazole by mouth every three hours. Before each course sodium sulphathiazole 1 g. was given intravenously.

Blood-culture taken at the conclusion of both courses was negative, and the stools and urine, cultured six times at intervals of a week, were negative on each occasion (stools had been positive on two occasions before treatment). This man had an evening temperature of 99° F for four days after the end of the second course of treatment, after which his convalescence was normal, except for the development of a painless cold abscess in his thigh, which on aspiration gave a pure growth of typhoid bacilli. *Irrigation of the* abscess cavity with penicillin solution on two occasions cleared this speedily.

CASE 4

A man, aged 57, was treated in the acute stage by my assistant, Dr. F. C. O'Herlihy. The patient was a huge man, weighing 19 st. before his illness. On admission, on the 14th day of disease, his condition was very poor. He was cyanosed, a little dyspnœic, and drowsy. There was a good deal of flatulent distension; heart in fibrillation; considerable albuminuria. *History* of malaria and dysentery, with several recurrences. A more unsuitable subject for enteric would be difficult to find.

His blood-culture being positive for *Bact. typhosum,* it was agreed to treat him along the same lines as cases 2 and 3. *Accordingly,* he was given 2 g. of sodium sulphathiazole intravenously on the 18th day, followed by 1 g. by mouth

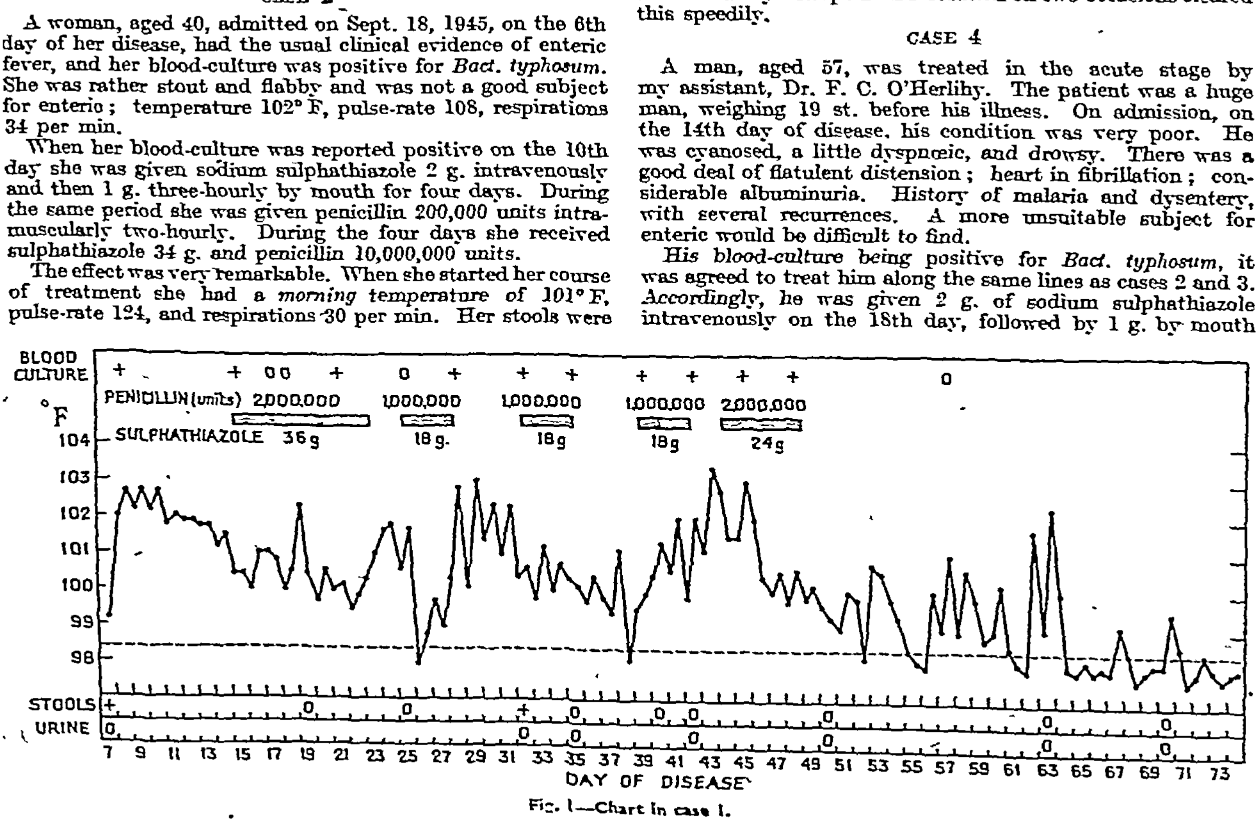


Fig. 1—Chart in case 1.

every three hours, with 200,000 units of penicillin intramuscularly two-hourly, until a total of 34 g. of sulphathiazole and 10,000,000 units of penicillin had been given over a period of four days (fig. 2).

The patient's condition improved considerably; toxæmia was very much less, and the heart was not so irregular. On the day after the end of the first course Dr. O'Herlihy's note was: "Very bright this morning. Feeling very hungry. Flatulence less troublesome. No stool. Had a very good night's sleep. Heart more regular and tone fair. Pulse and temperature down." Blood-culture taken on this day (23rd of disease) was negative for *Bact. typhosum*, as were the fæces and urine.

Two days after the end of the first course blood appeared in the stools, and the second course of sulphathiazole and penicillin (identical with the first) was started. Blood continued to show in the stools for a few days, but the patient's condition steadily improved, and after the conclusion of the second course the temperature was normal and remained so thereafter. Blood-culture taken after the end of the second course was negative for *Bact. typhosum*, as were the stools and urine.

The subsequent course was very satisfactory. Temperature and pulse-rate remained normal; the heart was regular; the urine, which had been loaded with albumin, showed none or only a trace; the stools were formed and free of blood; and, apart from a slight peripheral neuritis of the feet, convalescence was uneventful. Five samples of his urine and fæces were negative for *Bact. typhosum* before his discharge from hospital.

It is difficult to imagine this patient recovering from so severe an attack of enteric fever, complicated as it was by intestinal hæmorrhage, if treated without sulphathiazole and penicillin. His age, physique, condition when coming under treatment, and previous medical history all indicated a grave prognosis. After the second course his condition gave rise to no anxiety, and his convalescence would have been considered rapid in a young and healthy patient.

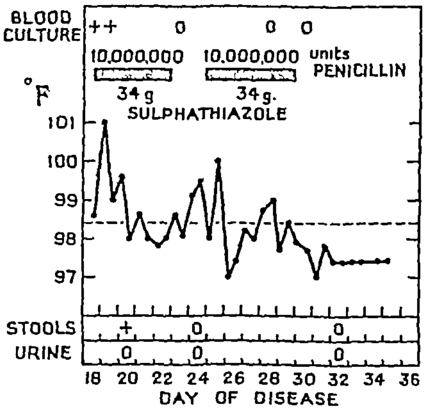


Fig. 2—Chart in case 4.

CASE 5

A girl, aged 17, admitted on Dec. 21, 1945, on the 14th day of disease, presented a typical enteric picture, with tumid distended abdomen, rose spots, enlarged spleen, and pea-soup stools. Widal positive (1/25,000 for *Bact. typhosum* "H," 1/32,000 for *Bact. typhosum* "O," and 1/200 for *Bact. typhosum* "Vi"). Her fæces were also positive for *Bact. typhosum*. Temperature 102·6° F, pulse-rate 110, and respirations 28 per min.

When the bacteriological confirmation was available (17th day) she was put on penicillin-sulphathiazole treatment. The dosage was exactly the same as for cases 2, 3, and 4 —i.e., penicillin 10,000,000 units and sulphathiazole 34 g. administered in four days. At the end of the first course her temperature settled (fig. 3), her stools were formed, and toxæmia was absent. Blood-culture was negative for *Bact. typhosum*, but her stools were positive. She remained apyrexial for eleven days, and a blood-count after the first course showed that her white cells were down to 4000 per c.mm., with only 30% of neutrophils, so we withheld a second course of the drugs pending developments. Thirteen days after the first course was completed she had a relapse, during which her temperature reached almost 103° F on one occasion (36th day). Although her blood-culture remained negative, we gave her the second course of penicillin 10,000,000 units and sulphathiazole 34 g., after which she made a rapid recovery. Because of the leucopenia we did daily blood-counts while she was on the second course, but the total white-cell count actually increased, as did the percentage of neutrophils.

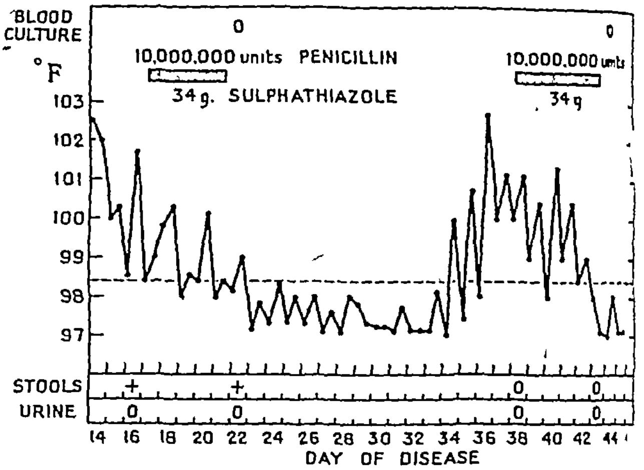


Fig. 3—Chart in case 5.

DISCUSSION

To draw general conclusions from five cases would be unwise; but it should be borne in mind that these cases were specially selected because of their severity, being the worst cases of typhoid admitted in nine months. All five patients recovered.

The most striking feature observed in the four cases given the high dosage was the disappearance of toxæmia, the speedy subsidence of pyrexia (which normally would have persisted for weeks), and the rapid return of formed stools. It is well known that during and after the third week of a severe enteric infection there are two main dangers which can occur singly or in combination: (1) steadily increasing toxæmia leading to the "typhoid state"; and (2) intestinal complications—e.g., hæmorrhage, perforation, meteorism, and excessive diarrhœa. No general or local deterioration developed in any of the four cases after the end of the second course of intensive treatment. On the contrary, the patients were bright, cheerful, and eager for solid food.

Because of the high dosage with sulphonamides blood-counts were done at short intervals—always at the beginning and end of a course of treatment. Only in one case (and this was after a single course) was any reduction in the neutrophils observed, and this was not aggravated by a second course of sulphonamides given later. This is in line with our general experience that sulphonamides given in very large doses over a period of a week are not so likely to cause neutropenia as when given in small doses over a long period. The system of dosage followed in the last four cases was arbitrary and may require modification with further experience.

SUMMARY

Five cases of severe typhoid were treated with sulphathiazole and penicillin.

The first case was given doses of penicillin appropriate for a staphylococcal infection, with no appreciable effect on the pyrexia or blood-cultures, although toxæmia was much lessened, and there were no complications due to ulceration.

The next four cases were treated intensively with penicillin and sulphathiazole, receiving two courses each comprising 10,000,000 units of penicillin and about 34 g. of sulphathiazole given in four days. Speedy disappearance of toxæmia, subsidence of pyrexia, and disappearance of organisms from the blood, fæces, and urine followed the end of the second course in three of the four cases. In the fourth case, when the second course was postponed for about a fortnight, there was a relapse, which rapidly subsided when the second course was initiated.

The clinical effects appear to confirm the laboratory findings of Bigger.[1]

POSTSCRIPT

Since this paper was submitted for publication another severe case of typhoid fever has been treated with penicillin and sulphonamides, as follows:

CASE 6.—A girl, aged 17 years, admitted on March 16, 1946, in the 3rd week of her typhoid, gravely ill, bordering on "typhoid state." Clinically enteric—abdomen very distended, spleen palpable, rose spots present, temperature 102°–103° F, pulse-rate 122–140, respirations 30–36 per min., Widal positive for *Bact. typhosum* "H" to 1/250 and for "O" to 1/50.

Because of the patient's grave condition it was decided to start penicillin-sulphonamide treatment before the result of the blood-culture was available, and, accordingly, the system of treatment followed in the last 4 cases of the series described above was initiated on March 18. The first course was finished on the 21st; the second began on the 24th and terminated on the 28th. After the conclusion of the second course the temperature, which had ranged between 100° and 104° F while the treatment was being applied, underwent lysis and has been settled since April 6. Toxæmia was much lessened from the time the treatment was started and was absent before the second course was concluded. The blood-cultures taken on the conclusion of the second course were negative and ten samples each of fæces and urine examined during and subsequent to the treatment were negative for *Bact. typhosum*. No ulcerative accidents of any kind occurred, and the patient's condition gave rise to no anxiety after the conclusion of the second course of treatment.

There appears to be a strong prima-facie case for extending this new line of treatment to the typhoid carrier state, and investigations along these lines are in progress in Eire.

I am indebted to the Medical Research Council of Ireland for a grant in connexion with this investigation.

MALARIA TRANSMISSION IN BORNEO

JOHN N. MCARTHUR
M.R.C.S.

MALARIA RESEARCH OFFICER, NORTH BORNEO

THIS paper is a brief account of malaria research carried out under the North Borneo Government for three years before the war. It should normally have been published in 1942, but the Japanese occupation of Borneo and my internment by them prevented this.

Before this work, *Anopheles maculatus*, the chief vector of malaria in the interior of Malaya, was regarded as the chief vector in Borneo also; but this belief was based on the indirect evidence of its Malayan reputation nd not on the direct evidence of dissections. During nitial work on the coast of Borneo in 1939, however, his belief in the virulence of *A. maculatus* could not be econciled with the facts, particularly the healthiness of ertain towns where *A. maculatus* abounded.

Later work was carried out in the interior at Tambunan, an isolated plain at an altitude of 2000 feet, ccupied largely by irrigated paddy fields, surrounded by high jungle-covered hills, and subject to intense malaria. Here a larval survey found the whole area to be virtually one vast anopheles breeding-place, with twelve species or varieties of anopheles breeding widely; and the problem seemed to be to control rather than to explain the malaria. Of the twelve anopheles, four were under suspicion, and the remaining eight were discounted.

A malaria survey found a curious situation. In the centre of the plain, where anopheles bred most intensely, there was little malaria: but malaria increased toward the hills, until in the hills and hill ravines malaria was universal in spite of apparently sparse breeding of anopheles. This was taken as evidence in favour of the assumption that *A. maculatus* was the vector, and led to the adoption of the rule that intensity of malaria was proportional to proximity to the hills. To this rule, however, there was a peculiar exception, a village in a hill ravine which showed only 25% of malaria. Attempts to explain this were futile: the assumption that there were fewer anopheles there was soon found to be false; and the idea that *A. maculatus* was less abundant there was dispelled by a survey which demonstrated that *A. maculatus* was much more abundant than usual, for jungle-clearing had created ideal breeding-places for them.

DISCOVERY OF THE VECTOR

Indirect evidence for the vector, therefore, was inconclusive, and attention was directed to its incrimination by actual dissection. Here another difficulty arose. Widespread search of native huts for many months did not lead to the capture of a single anopheles. No mosquitoes were ever seen, and the natives, in even the most malarious situations, were emphatic that they were never bitten by mosquitoes. Here was an area with widespread breeding of potentially dangerous mosquitoes, and with intense malaria, but with apparently no adult mosquitoes to transmit the infection.

A human-bait trap, of a design successful in other parts of the world, likewise virtually failed. Operation of the trap every hour, from sunset to dawn, in various situations and in every season of the year, captured an average of only one mosquito every twelve hours of trapping, and trapping was sometimes carried out for many nights in highly malarious villages without a single mosquito being taken. Captures of *A. maculatus* were so sparse that to afford sufficient dissections by this method would have employed an operator all night every night for many years. Searches on cattle were at first equally unsuccessful, until it was discovered that anopheles came out and fed on the animals in large numbers at dusk, and disappeared shortly after dark.

The first light on the situation came when a comparison of the relative yields after some months of human-bait and animal-bait trapping showed that practically all species of anopheles in the locality had a high preference for animal blood and little interest in human bait. *A. maculatus*, for example, sought animal blood in 85% of cases. These insects, therefore, could not be regarded as important vectors of human malaria. Further, it was found that only one species of anopheles had a preference for human blood, but a preference which it showed in 90% of cases. This mosquito was *A. leucosphyrus*, which had previously been discounted because of its harmless reputation elsewhere and its apparently extreme rarity in Tambunan, in both larval and adult stages.

With this information, renewed search was made for dissection material, especially *A. leucosphyrus*; and finally natives, whom we had been encouraging to use antimalarial measures, brought in anopheles captured in defective mosquito-nets. These mosquitoes all proved to be *A. leucosphyrus*. Dissections of these proved *A. leucosphyrus* to be a vector, and 25 positives proved it to be almost certainly the only vector in the locality, all other species, including *A. maculatus*, remaining negative out of a total of 2700 dissections.

Epidemiological and other evidence is in favour of *A. leucosphyrus* as a vector in many other places in Borneo, and a study of the records shows that it has been found infected in Dutch territory. It appears to be the most widely distributed mosquito in Borneo and is almost certainly the chief vector of malaria throughout the island. Far from being rare in the locality, it was breeding widely, but unconventional methods of search, often including the felling of jungle, were required for its discovery, because, unlike most malaria vectors, it breeds only in the jungle.

The mystery of malaria transmission was finally solved by watching all night in houses where the mosquito had already been captured in defective nets. This revealed that the insect was entering the houses long after midnight, feeding on the sleeping and unsuspecting every three hours, with 200,000 units of penicillin intramuscularly two-hourly, until a total of 34 g. of sulphathiazole and 10,000,000 units of penicillin had been given over a period of four days (fig. 2).

The patient's condition improved considerably; toxæmia was very much less, and the heart was not so irregular. On the day after the end of the first course Dr. O'Herlihy's note was: "Very bright this morning. Feeling very hungry. Flatulence less troublesome. No stool. Had a very good night's sleep. Heart more regular and tone fair. Pulse and temperature down." Blood-culture taken on this day (23rd of disease) was negative for *Bact. typhosum*, as were the fæces and urine.

Two days after the end of the first course blood appeared in the stools, and the second course of sulphathiazole and penicillin (identical with the first) was started. Blood continued to show in the stools for a few days, but the patient's condition steadily improved, and after the conclusion of the second course the temperature was normal and remained so thereafter. Blood-culture taken after the end of the second course was negative for *Bact. typhosum*, as were the stools and urine.

The subsequent course was very satisfactory. Temperature and pulse-rate remained normal; the heart was regular; the urine, which had been loaded with albumin, showed none or only a trace; the stools were formed and free of blood; and, apart from a slight peripheral neuritis of the feet, convalescence was uneventful. Five samples of his urine and fæces were negative for *Bact. typhosum* before his discharge from hospital.

It is difficult to imagine this patient recovering from so severe an attack of enteric fever, complicated as it was by intestinal hæmorrhage, if treated without sulphathiazole and penicillin. His age, physique, condition when coming under treatment, and previous medical history all indicated a grave prognosis. After the second course his condition gave rise to no anxiety, and his convalescence would have been considered rapid in a young and healthy patient.

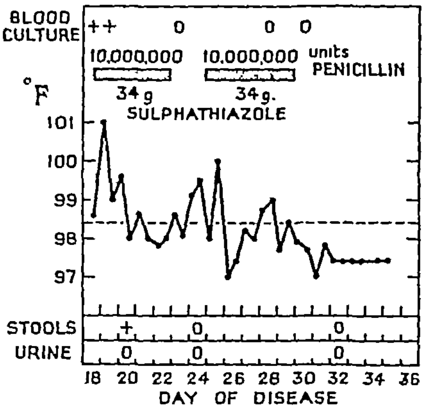


Fig. 2—Chart in case 4.

CASE 5

A girl, aged 17, admitted on Dec. 21, 1945, on the 14th day of disease, presented a typical enteric picture, with tumid distended abdomen, rose spots, enlarged spleen, and pea-soup stools. Widal positive (1/25,000 for *Bact. typhosum* "H," 1/32,000 for *Bact. typhosum* "O," and 1/200 for *Bact. typhosum* "Vi"). Her fæces were also positive for *Bact. typhosum*. Temperature 102·6° F, pulse-rate 110, and respirations 28 per min.

When the bacteriological confirmation was available (17th day) she was put on penicillin-sulphathiazole treatment. The dosage was exactly the same as for cases 2, 3, and 4—i.e., penicillin 10,000,000 units and sulphathiazole 34 g. administered in four days. At the end of the first course her temperature settled (fig. 3), her stools were formed, and toxæmia was absent. Blood-culture was negative for *Bact. typhosum*, but her stools were positive. She remained apyrexial for eleven days, and a blood-count after the first course showed that her white cells were down to 4000 per c.mm., with only 30% of neutrophils, so we withheld a second course of the drugs pending developments. Thirteen days after the first course was completed she had a relapse, during which her temperature reached almost 103° F on one occasion (36th day). Although her blood-culture remained negative, we gave her the second course of penicillin 10,000,000 units and sulphathiazole 34 g., after which she made a rapid recovery. Because of the leucopenia we did daily blood-counts while she was on the second course, but the total white-cell count actually increased, as did the percentage of neutrophils.

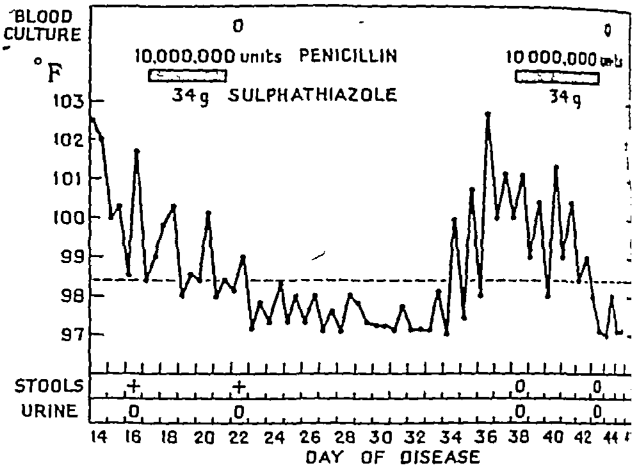


Fig. 3—Chart in case 5.

DISCUSSION

To draw general conclusions from five cases would be unwise; but it should be borne in mind that these cases were specially selected because of their severity, being the worst cases of typhoid admitted in nine months. All five patients recovered.

The most striking feature observed in the four cases given the high dosage was the disappearance of toxæmia, the speedy subsidence of pyrexia (which normally would have persisted for weeks), and the rapid return of formed stools. It is well known that during and after the third week of a severe enteric infection there are two main dangers which can occur singly or in combination: (1) steadily increasing toxæmia leading to the "typhoid state"; and (2) intestinal complications—e.g., hæmorrhage, perforation, meteorism, and excessive diarrhœa. No general or local deterioration developed in any of the four cases after the end of the second course of intensive treatment. On the contrary, the patients were bright, cheerful, and eager for solid food.

Because of the high dosage with sulphonamides blood-counts were done at short intervals—always at the beginning and end of a course of treatment. Only in one case (and this was after a single course) was any reduction in the neutrophils observed, and this was not aggravated by a second course of sulphonamides given later. This is in line with our general experience that sulphonamides given in very large doses over a period of a week are not so likely to cause neutropenia as when given in small doses over a long period. The system of dosage followed in the last four cases was arbitrary and may require modification with further experience.

SUMMARY

Five cases of severe typhoid were treated with sulphathiazole and penicillin.

The first case was given doses of penicillin appropriate for a staphylococcal infection, with no appreciable effect on the pyrexia or blood-cultures, although toxæmia was much lessened, and there were no complications due to ulceration.

The next four cases were treated intensively with penicillin and sulphathiazole, receiving two courses each comprising 10,000,000 units of penicillin and about 34 g. of sulphathiazole given in four days. Speedy disappearance of toxæmia, subsidence of pyrexia, and disappearance of organisms from the blood, fæces, and urine followed the end of the second course in three of the four cases. In the fourth case, when the second course was postponed for about a fortnight, there was a relapse, which rapidly subsided when the second course was initiated.

The clinical effects appear to confirm the laboratory findings of Bigger.[1]

POSTSCRIPT

Since this paper was submitted for publication another severe case of typhoid fever has been treated with penicillin and sulphonamides, as follows:

CASE 6.—A girl, aged 17 years, admitted on March 16, 1946, in the 3rd week of her typhoid, gravely ill, bordering on "typhoid state." Clinically enteric—abdomen very distended, spleen palpable, rose spots present, temperature 102°–103° F, pulse-rate 122–140, respirations 30–36 per min., Widal positive for *Bact. typhosum* "H" to 1/250 and for "O" to 1/50.

Because of the patient's grave condition it was decided to start penicillin-sulphonamide treatment before the result of the blood-culture was available, and, accordingly, the system of treatment followed in the last 4 cases of the series described above was initiated on March 18. The first course was finished on the 21st; the second began on the 24th and terminated on the 28th. After the conclusion of the second course the temperature, which had ranged between 100° and 104° F while the treatment was being applied, underwent lysis and has been settled since April 6. Toxæmia was much lessened from the time the treatment was started and was absent before the second course was concluded. The blood-cultures taken on the conclusion of the second course were negative and ten samples each of fæces and urine examined during and subsequent to the treatment were negative for *Bact. typhosum*. No ulcerative accidents of any kind occurred, and the patient's condition gave rise to no anxiety after the conclusion of the second course of treatment.

There appears to be a strong prima-facie case for extending this new line of treatment to the typhoid carrier state, and investigations along these lines are in progress in Eire.

I am indebted to the Medical Research Council of Ireland for a grant in connexion with this investigation.

MALARIA TRANSMISSION IN BORNEO

JOHN N. McARTHUR
M.R.C.S.
MALARIA RESEARCH OFFICER, NORTH BORNEO

THIS paper is a brief account of malaria research arried out under the North Borneo Government for hree years before the war. It should normally have een published in 1942, but the Japanese occupation f Borneo and my internment by them prevented this.

Before this work, *Anopheles maculatus*, the chief ector of malaria in the interior of Malaya, was regarded s the chief vector in Borneo also; but this belief was ased on the indirect evidence of its Malayan reputation nd not on the direct evidence of dissections. During nitial work on the coast of Borneo in 1939, however, his belief in the virulence of *A. maculatus* could not be reconciled with the facts, particularly the healthiness of ertain towns where *A. maculatus* abounded.

Later work was carried out in the interior at Tambunan, an isolated plain at an altitude of 2000 feet, occupied largely by irrigated paddy fields, surrounded by high jungle-covered hills, and subject to intense malaria. Here a larval survey found the whole area to be virtually one vast anopheles breeding-place, with twelve species or varieties of anopheles breeding widely; and the problem seemed to be to control rather than to explain the malaria. Of the twelve anopheles, four were under suspicion, and the remaining eight were discounted.

A malaria survey found a curious situation. In the centre of the plain, where anopheles bred most intensely, there was little malaria; but malaria increased toward the hills, until in the hills and hill ravines malaria was universal in spite of apparently sparse breeding of anopheles. This was taken as evidence in favour of the assumption that *A. maculatus* was the vector, and led to the adoption of the rule that intensity of malaria was proportional to proximity to the hills. To this rule, however, there was a peculiar exception, a village in a hill ravine which showed only 25% of malaria. Attempts to explain this were futile: the assumption that there were fewer anopheles there was soon found to be false; and the idea that *A. maculatus* was less abundant there was dispelled by a survey which demonstrated that *A. maculatus* was much more abundant than usual, for jungle-clearing had created ideal breeding-places for them.

DISCOVERY OF THE VECTOR

Indirect evidence for the vector, therefore, was inconclusive, and attention was directed to its incrimination by actual dissection. Here another difficulty arose. Widespread search of native huts for many months did not lead to the capture of a single anopheles. No mosquitoes were ever seen, and the natives, in even the most malarious situations, were emphatic that they were never bitten by mosquitoes. Here was an area with widespread breeding of potentially dangerous mosquitoes, and with intense malaria, but with apparently no adult mosquitoes to transmit the infection.

A human-bait trap, of a design successful in other parts of the world, likewise virtually failed. Operation of the trap every hour, from sunset to dawn, in various situations and in every season of the year, captured an average of only one mosquito every twelve hours of trapping, and trapping was sometimes carried out for many nights in highly malarious villages without a single mosquito being taken. Captures of *A. maculatus* were so sparse that to afford sufficient dissections by this method would have employed an operator all night every night for many years. Searches on cattle were at first equally unsuccessful, until it was discovered that anopheles came out and fed on the animals in large numbers at dusk, and disappeared shortly after dark.

The first light on the situation came when a comparison of the relative yields after some months of human-bait and animal-bait trapping showed that practically all species of anopheles in the locality had a high preference for animal blood and little interest in human bait. *A. maculatus*, for example, sought animal blood in 85% of cases. These insects, therefore, could not be regarded as important vectors of human malaria. Further, it was found that only one species of anopheles had a preference for human blood, but a preference which it showed in 90% of cases. This mosquito was *A. leucosphyrus*, which had previously been discounted because of its harmless reputation elsewhere and its apparently extreme rarity in Tambunan, in both larval and adult stages.

With this information, renewed search was made for dissection material, especially *A. leucosphyrus*; and finally natives, whom we had been encouraging to use antimalarial measures, brought in anopheles captured in defective mosquito-nets. These mosquitoes all proved to be *A. leucosphyrus*. Dissections of these proved *A. leucosphyrus* to be a vector, and 25 positives proved it to be almost certainly the only vector in the locality, all other species, including *A. maculatus*, remaining negative out of a total of 2700 dissections.

Epidemiological and other evidence is in favour of *A. leucosphyrus* as a vector in many other places in Borneo, and a study of the records shows that it has been found infected in Dutch territory. It appears to be the most widely distributed mosquito in Borneo and is almost certainly the chief vector of malaria throughout the island. Far from being rare in the locality, it was breeding widely, but unconventional methods of search, often including the felling of jungle, were required for its discovery, because, unlike most malaria vectors, it breeds only in the jungle.

The mystery of malaria transmission was finally solved by watching all night in houses where the mosquito had already been captured in defective nets. This revealed that the insect was entering the houses long after midnight, feeding on the sleeping and unsuspecting natives, and flying away long before dawn. It seemed to be too impatient a feeder to be captured by the human-bait trap.

ATTEMPT TO CONTROL

The incrimination of a jungle-breeding mosquito explained why the centre of the plain, with its wide-spread but harmless mosquito-breeding, was healthy; why the jungle-covered hills were malarious; why the jungle-free village in the hills was malaria-free, in spite of many mosquitoes breeding there; and why the towns of Borneo, being cleared of jungle, were healthy in contrast to their highly malarious jungle-covered environs.

Such a discovery is only of value if it can be applied to practical malaria control; so an attempt was made to abolish *A. leucosphyrus* by jungle-clearing and other methods. In a village with a spleen-rate of 100% jungle was cleared for an average distance of 30 feet round each breeding-place of *A. leucosphyrus* in the locality. Unfortunately the Japanese occupation of Borneo interrupted the experiment when only half the 150 breeding-places had been dealt with; hence it failed as a demonstration of malaria control, though it succeeded as a demonstration of simple jungle-clearance and the admission of sunlight as an easy and immediately effective measure of control of *A. leucosphyrus*, a control which would appear to be permanent if cattle were admitted to graze.

Though the unfinished experiments failed to control malaria, there appears to be a considerable weight of evidence to support the belief that in Borneo the simple clearance of jungle has led to the control of malaria in several places. The general healthiness of cultivated areas, towns, and other open spaces in Borneo is usually in strong contrast to the highly malarious nature of jungle-covered areas.

IMPLICATIONS OF DISCOVERY

Thus the conditions in Borneo appear to be the reverse of those in Malaya. Certain measures that are successful for the control of malaria in Malaya may, in Borneo, encourage the very disease they are intended to control. In the interior of Malaya, the land becomes malarious when jungle is disturbed and *A. maculatus* thereby introduced; whereas in Borneo when jungle is destroyed the land appears to become healthy. The economic importance of this is considerable. It means that industrial progress in Borneo should not be, as in so many other countries, a menace to health by encouraging malaria, but that economic development of any kind which destroys jungle should lead to malaria control in Borneo; and measures for the control of malaria there should contribute at the same time to economic prosperity.

A. leucosphyrus is regarded in most other countries as harmless. In Malaya, for example, its presence is considered to indicate a healthy area, as it means the absence of the proved vector, *A. maculatus*. On the other hand, the evidence for the harmlessness of *A. leucosphyrus* in other countries is slight. In Borneo it has taken two years to discover that *A. leucosphyrus* is a dangerous vector, or even to discover its presence in considerable numbers, because it is so elusive. In Tambunan it was so difficult to find by conventional methods that, had some other common vector, such as *A. minimus*, been present, it is certain that this would have been accused of the whole responsibility for local malaria, and *A. leucosphyrus* would have escaped incrimination.

The published work shows that though often claimed to be harmless—e.g., in Ceylon, Malaya, India, and elsewhere—wherever *A. leucosphyrus* has been studied in adequate numbers it has always been found positive on dissection. *A. leucosphyrus* may prove to have much more relation to malaria in other parts of the world than has hitherto been supposed, its presence being masked by its elusiveness, and its virulence by the presence of some other much more easily captured and incriminated mosquito.

SUMMARY

Anopheles maculatus has hitherto been regarded as the chief vector of malaria in Borneo; and *Anopheles leucosphyrus* has generally been regarded as harmless both in Borneo and throughout the East.

Work done in Borneo, however, shows that *A. maculatus* has little, or probably no, importance as a vector of malaria there.

A. leucosphyrus, on the other hand, has been shown to be the most dangerous vector of malaria, probably throughout the greater part of the island.

A. leucosphyrus, being a purely jungle-breeding mosquito, is easily controlled by localised jungle-clearance round its breeding-places. Further evidence of the success of this as an antimalarial measure in Borneo is found in the general healthiness of the cultivated areas, towns, and other localities which have been cleared of jungle.

Measures appropriate for malaria control in Malaya and other countries may not only fail but may even encourage the disease in Borneo.

The methods of malaria control suitable for Borneo are cheap, simple, effective, and permanent, and go hand in hand with the economic development of the land.

Since *A. leucosphyrus* is so elusive, it may be an important vector in other countries where it has not hitherto been considered of consequence, but where its virulence is being masked by the presence of some less elusive vector.

I have pleasure in acknowledging the coöperation of the British North Borneo Government and the helpful interest of Sir Malcolm Watson, then Director of the Ross Institute, in this work, a full account of which will be published shortly.

PENICILLIN VIA FALLOPIAN TUBES

A. RUNE FRISK
M.D. Stockholm
PHYSICIAN, ST ERIK'S HOSPITAL, STOCKHOLM

AXEL WESTMAN
M.D. Stockholm
PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, CAROLINE HOSPITAL STOCKHOLM

EVEN a very mild infection of the tubes after an operation for sterility may jeopardise the final result, despite the improved technique of Westman (1944).

In an attempt to eliminate this risk the course was adopted nearly a year ago of instilling penicillin solutions into the tubes during the four or five days immediately following the operation. It is impossible to assess the value of this procedure unless we know how the penicillin is absorbed and excreted after such instillations. For this reason the following experiment was made. Five patients showing no sign of kidney injuries were each given a single intramuscular dose of penicillin 20,000 units. On a later occasion the dose was administered by instillation through one of the tubes. The penicillin concentrations in the blood and the urine were followed during the experiment.

First a single dose of penicillin 20,000 units was given intramuscularly. Twenty-four hours later an equal dose was instilled into the tube with the aid of the instruments used in salpingography. Blood samples were taken in sterile tubes at intervals of $^1/_2$, 1, 2, and 4 hours after the administration of the dose and immediately placed in the refrigerator. Their bacteriostatic powers were then determined by the method already published (Frisk 1945). All urine was collected quantitatively during the twelve hours following the dose. Urine samples were taken by catheterisation after 1, 2, 4, 6, 8, and 12 hours. Their volumes and pH values were measured, and the latter were adjusted to 6–7 if they lay outside this range. A 10-ml. portion of each sample was taken for assay, shaken with three drops of chloroform, and

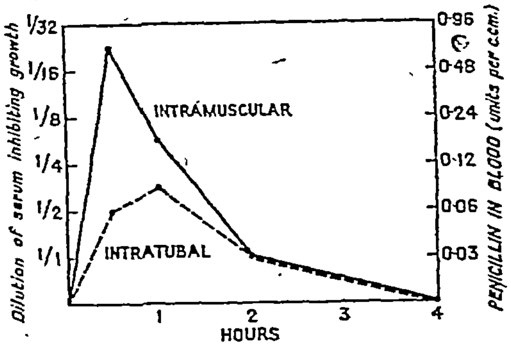


Fig. 1—Mean concentrations of penicillin in the blood of 5 patients after intramuscular and intratubal administration.

immediately placed in the refrigerator. The samples were then assayed in quadruplicate by the cylinder-plate method of Heatley (1944). In each case the standard solution, in terms of which the penicillin content of the urine was expressed, was a portion of the solution used in the experiment concerned.

RESULTS

Fig. 1 shows the mean concentrations of penicillin in the blood, and fig. 2 the mean amounts excreted in the urine in these five patients after intramuscular injection and tubal instillation of 20,000 units of penicillin.

After intramuscular administration a blood concentration-time curve was obtained which agreed completely with the relationship earlier described (Frisk 1945). If the same dose is administered tubally, the maximal concentration first appears in the blood after an hour. This value is then only from a fifth to an eighth of that found after intramuscular administration.

The slower absorption after intratubal administration is further demonstrated in fig. 2, which represents the excretion of penicillin in the urine. After intramuscular injection 90% of the total amount of penicillin recovered from the urine was excreted within two hours; after four hours the excretion was practically complete. In these experiments a mean of 61% of the dose was recovered, with variations for the individual experiments from 54% to 78%. This agrees with previous observations (Heatley 1944, Herrel 1945).

If, on the other hand, penicillin was introduced by way of the tubes, only 62% of the recovered quantity was excreted in two hours, and penicillin could be detected in the urine after ten hours. Here a mean of 51% of the dose was recovered, with variations from 49% to 58% for the individual experiments.

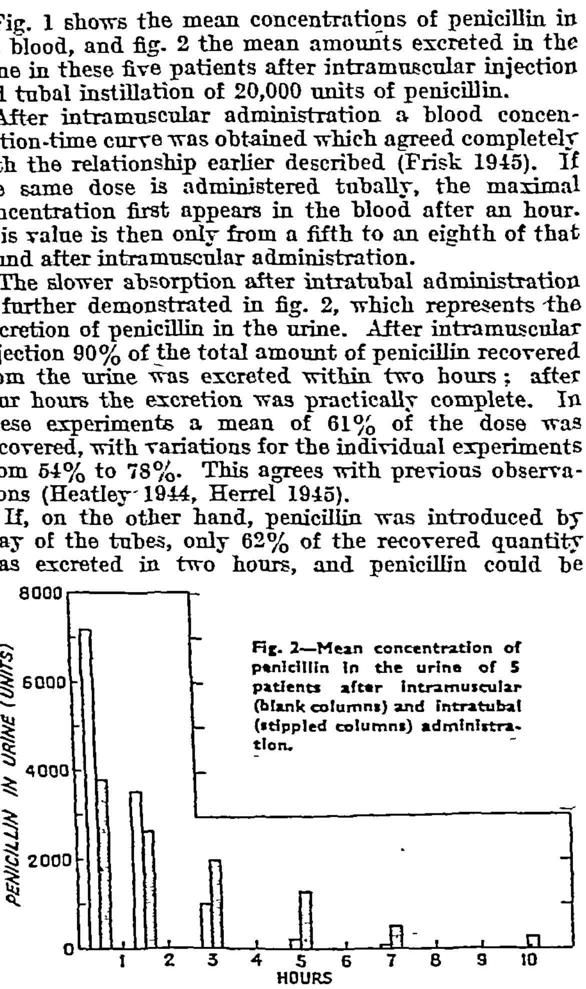


Fig. 2—Mean concentration of penicillin in the urine of 5 patients after intramuscular (blank columns) and intratubal (stippled columns) administration.

DISCUSSION

When penicillin is administered by instillation into the tubes, in which circumstances the greater part should enter the peritoneal cavity, the absorption is only insignificantly lower than after intramuscular injection. When equal doses are given in all cases, a mean of 61% is recovered in the urine after intramuscular injection, the corresponding figure for intratubal administration being 51%. Penicillin is absorbed more slowly, on the other hand, when it is given through the tubes than when it is injected intramuscularly. Consequently the concentrations in the blood become smaller and a longer time elapses before the excretion by the kidneys is completed after tubal administration than when the same dose is given intramuscularly. Similar relationships have been observed after intrapleural application (Heatley 1945).

The practical consequence of instillation of 20,000 units of penicillin into the tubes every twelfth hour is that a high bacteriostatic concentration can continually be maintained locally in the tubes and the lower part of the peritoneal cavity. There is therefore a possibility of preventing or treating, by local penicillin therapy, infections in the tubes and the pelvis caused by bacteria sensitive to penicillin. This form of treatment may perhaps prove valuable in salpingitis, which is otherwise difficult to combat.

REFERENCES

Frisk, A. R. (1945) *Nord. Med.* 28, 2249.
Heatley, N. G. (1944) *Biochem. J.* 38, 61.
— (1945) *Lancet*, i, 590.
Herrel, W. E. (1945) Penicillin and Other Antibiotic Agents, London.
Westman, A. (1944) *Nord. Med.* 22, 1161.

DIGESTIBILITY OF HIGH-EXTRACTION WHEATEN FLOURS

R. G. Booth
Ph.D. Reading

T. Moran
C.B.E., D.Sc. Lpool, Ph.D. Camb.

From the Research Association of British Flour Millers, Cereals Research Station, St. Albans

The present world wheat shortage, particularly the critical shortage of cereals in Germany, Austria, and India, has focused attention on the rate of extraction of wheat which will give the maximal yield of available calories.

Macrae et al. (1942), using as subjects six healthy young men, determined the digestibility of bread made from 73% and 100% extraction flours in terms of energy and nitrogen. The diet during the experimental period was adjusted so that the bread contributed 74% of the energy intake and 90% of the total nitrogen; the total daily calorie intake of the diet ranged between 2800 and 3400 calories. The experiments lasted from eleven to twelve days. The white bread gave digestibilities of 96·1% (energy) and 91·1% (protein), and the corresponding figures for wholemeal bread were 87·0 and 85·5; the granularity or particle size of the flours had no effect on digestibility. Using these data and making the reasonable assumption that the digestibility of a flour in terms of energy is proportional to its fibre content, Moran and Pace (1942) calculated the following average digestibilities:

% Extraction	75	85	90	95	100
% Digestibility (energy)	97·0	93·9	91·5	88·7	86·3

These figures indicate further that the digestibilities of the increments between extraction-rates of 85–90%, 90–95%, and 95–100% are approximately 50%, 40%, and 40%.

In a reconsideration of the problem McCance et al. (1945) have concluded that the available calories in 100 g. of 100%, 85%, and 75% flours (all at 15% moisture content) are 310, 340, and 342. From these figures it may be calculated that the available calories in the fraction remaining in the milling of 85% flour (15% offals) amount to 140 calories per 100 g. of offals. If therefore the digestibility of 75% flour is taken as 97%, the digestibility of the 85–100% fraction is 40%. Expressed in another way, the available calories contained in the flours milled to different extractions from the same bulk (100 g.) of wheat are as follows :

% Extraction	75	85	90	95	100
Available calories per 100 g. of wheat *	256	289	296	303	310

* Moisture content 15%.

As will be shown below, these investigations provide evidence that, where calories are the only concern, the optimal extraction of wheat is 100%. It should also be noted that the digestibility figures of Macrae et al. take into account any "intestinal hurry" due to the action of the bran, at least in the case of healthy young men. In view, however, of the great importance of the problem at the present time we have, with some trepidation, carried out a few experiments on the in-vitro digestibility of bran (wheat and rye).

EXPERIMENTAL

In the milling of 85% extraction flour the miller cleans the bran so thoroughly that the amount of endosperm remaining in the 15% offals is very small. Thus in the experiments of McCance et al. the fibre content of these offals was 10·5% against about 12% for the cleanest bran obtainable by special methods in the laboratory. The digestibility of high-extraction flours really hinges therefore on the amount of bran present and the extent to which it is utilised by man. Bran consists of the outer fibrous layer of the wheat grain (made up of the pericarp, testa, and hyaline layers) and its attached aleurone layer, together with a small and variable amount of endosperm. It is well known that the endosperm of wheat is more or less completely digested, and that the outer fibrous layer of the wheat grain is not so well digested by man, though it is largely available (by bacterial action) to ruminants.

Two samples of bran milled from a mixture of English and Canadian wheats were chosen. Sample I was a floury bran with an appreciable amount of endosperm adherent to it. Its fibre content was 7·20% (at 12·5% moisture), showing that it contained about 40% of endosperm. Sample II was a bran which had been cleaned very thoroughly with a special machine and contained only a trace of endosperm. The cleaning of this bran, however, had not been so severe as to remove any aleurone layer, as was apparent from microscopical examination. The fibre content of this sample (corrected to 12·5% moisture) was 11·8%.

Both samples were finely pulverised in a disintegrator type of mill to pass through a screen pierced with holes $^{1}/_{24}$ in. in diameter and thereafter were well mixed. Portions of these two powdered brans were set aside and labelled (I) and (II) respectively. The remainder of each was then made into a dough with water, with the addition of 1% of yeast and 0·25% of salt, which was then made into biscuits. When baked, these biscuits were dried thoroughly in a current of warm air and pulverised in the disintegrator mill. The comminuted biscuit baked from sample I was labelled sample III, and that from sample II was labelled sample IV.

The moisture content of all four final samples was determined (4 hours at 105° C), and the amount of fibre in them, as follows :

Sample	I	II	III	IV
% Moisture	11·5	9·8	7·3	5·6
% Fibre calculated to 12·5% moisture	7·2	11·6	7·1	11·8

As might be expected, the fibre content was not changed by the baking and regrinding of samples I and II.

Digestion of samples was planned to simulate reasonably closely the three stages of digestion in man : (1) salivary digestion, (2) acid gastric digestion, and (3) alkaline intestinal digestion. It was, however, clear that in such a programme at least two expedients would have to be adopted which do not obtain in normal digestion : (1) an estimate would have to be obtained of the initially soluble materials present in the samples, some of which perhaps require no digestion before being available for assimilation ; and (2), it being impossible to simulate the action of the intestinal flora, a preservative would be necessary during incubation.

Four 250 ml. Erlenmeyer flasks were taken for each sample, and 20 g. lots of the sample were weighed into each flask. As the same procedure was followed for each sample, it will be sufficient to describe the fate of the four 20 g. lots of any one sample.

To flask 1 was added 100 ml. of distilled water at a "striking" temperature of just over 40° C, so that the final temperature after mixing with the bran was 37° C. This was incubated for half an hour at 37° C and was then rapidly filtered on a tared paper under suction. The paper was washed twice with about 25 ml. of water and was then dried at 105° C for four hours and weighed, the drying (for periods of an hour) and weighing being repeated in the usual way until a constant figure was obtained. The dry material was carefully preserved in the desiccator.

To each of flasks 2, 3, and 4 were added 100 ml. of a filtered 10% solution of saliva in 0·1% NaCl solution, again at a suitable striking temperature. Incubation at 37° C proceeded for half an hour, after which flask 2 was treated precisely as flask 1.

To each of flasks 3 and 4 were added 1·5 ml. of conc. HCl and a few drops of saturated sodium acetate solution to bring the pH to about 2·0, thymol blue being used as external indicator. Then 0·5 g. of pepsin dissolved in 20 ml. of water was added, and the mixture was incubated for four hours.

Flask 3 was now treated exactly as flasks 1 and 2.

To flask 4 30% caustic soda was added cautiously and with frequent shaking until a pH of about 8·4 was reached. Phenol red was used as external indicator—it was made to turn red, but the liquor was not sufficiently alkaline to produce colour when tested with cresol-phthalein. To the flask was then added 20 ml. of a solution containing 0·5 g. of trypsin, 2 ml. of liquor pancreatini (*B.P.C.*), and 2 mg. of merthiolate. The concentration of the merthiolate had previously been shown by plating experiments to inhibit completely bacterial and mould growth for twenty-four hours. Incubation was continued for sixteen hours, and the contents of the flask were then treated exactly as its predecessors.

The dry residues from the various digestions were assayed for nitrogen by the micro-Kjeldahl technique, with copper selenite as catalyst, and a digestion period of three hours.

The complete results are shown in tables I–IV. A similar series of experiments with uncooked and cooked rye bran gave very similar results.

DISCUSSION

Microscopical examination of the bran samples subjected to the full in-vitro digestion showed that the contents of the aleurone cells had almost entirely disappeared. As digestion was not quite so thorough as normal human digestion, lacking intestinal flora, duodenal secretion, and succus entericus, the figure of 34% for the digestibility of the solids in cooked clean bran is in reasonable accord with the 40% figure calculated earlier in this paper. By contrast, the value of 65% for the digestibility of the protein of bran seems high ; but McCance (1946) suggests that the nitrogen, even in a 90% extraction flour, is largely absorbed, the increased amount of nitrogen excreted in the fæces being due to intestinal secretions rather than to indigestible protein in the flour ; and Borgstrom (1941) found that, in man, the provision of 30 g. of bran in an otherwise nitrogen-free diet, though increasing the fæcal excretion of nitrogen, yet brought the experimental subjects into positive N balance.

Dr. J. C. Hinton, working in these laboratories, has found by dissection and micro-analysis that, with one sample of wheat, the fibrous and aleurone layers amounted to 8% and 7% of the weight of the grain

TABLE I—WEIGHT OF BRAN IN GRAMMES AFTER EACH STAGE IN DIGESTION

Sample	Initial weight	Weight after—			
		$^1/_2$ hr. autolysis at 37° C	$^1/_2$ hr. ptyalin digestion pH 6·0	4 hr. pepsin digestion pH 2·0	16 hr. pancreatin digestion pH 8·0–8·5
I Ordinary bran ..	17·70	15·02	15·10	13·17	9·16
II Cleaned bran ..	18·03	15·18	15·35	14·28	12·78
III As (I) but cooked	18·55	15·36	12·22	10·56	8·95
IV As (II) but cooked	18·90	15·45	15·26	14·07	12·63

TABLE II—LOSS IN WEIGHT OF BRAN AFTER EACH STAGE IN DIGESTION AS % OF INITIAL WEIGHT

Sample	Initial weight	Loss in weight after—			
		$^1/_2$ hr. autolysis at 37° C	$^1/_2$ hr. ptyalin digestion pH 6·0	4 hr. pepsin digestion pH 2·0	16 hr. pancreatin digestion pH 8·0–8·5
I Ordinary bran ..	100 %	15 %	15 %	26 %	48 %
II Cleaned bran ..	100 %	16 %	15 %	21 %	29 %
III As (I) but cooked	100 %	17 %	34 %	43 %	52 %
IV As (II) but cooked	100 %	18 %	19 %	26 %	34 %

respectively, while their N contents were 0·7% and 3·15%. Further, the volume of the aleurone cells was roughly two-thirds of that of the aleurone layer. On these data the two digestibility figures of 34% and 65% for energy and protein are what might be expected, if we assume that the digestion of bran is essentially the digestion of the contents of the aleurone cells and neglect any digestion of the fibrous layer and aleurone cell walls by bacterial action. Fowls apparently utilise bran to about the same extent as man does. Thus Halnan (1944), using a coarse bran of fibre content 9·9%, found that, with fowls, it had a digestibility of 40·9% (calories) and 68·5% (nitrogen).

Using the generous conversion factors of $^1/_8$ and $^1/_{12}$, it appears that 100 g. of bran would give 38 and 25 calories in the form of eggs and pig meat respectively. The cow is of course the best converter; but, even so, the feeding of bran in the production ration of a milch cow leads to a slight loss of calories when compared with the calories yielded by the bran fed direct to man. Present-day bran has a protein equivalent (P.E.) of about 10% and a starch equivalent (S.E.) of 40%. Milk-production requires $^1/_2$ lb. P.E. and $2^1/_2$ lb. S.E. per gallon, and thus bran, not perfectly balanced for milk-production, would give 20 gallons of milk/100 lb. on a P.E. basis or 16 gallons/100 lb. on a S.E. basis. Taking the mean of these two values, it follows that 1 lb. of bran yields 1·44 pints or 28·8 oz. of milk. Therefore 100 g. of bran yields 180 g. of milk with a total calorie value of 118, which is somewhat less than the 140 calories available if the bran is fed direct to man.

This calculation is, however, based on the production ration only; the cow also requires additionally a maintenance ration of materials such as grass (and/or hay), roots, &c., which is largely inedible to man but which must provide daily about 7 lb. of S.E. and $^3/_4$ lb. of P.E. and for which the cow gives no return. In fact this maintenance ration fed to an average or medium producing dairy cow ($3^1/_2$ gallons a day) represents about 45% of the total ration on a S.E. basis and almost 30% of the ration in respect of P.E. Assuming then that the cow was dispensed with and the bran fed to man, the cow's maintenance ration could well be used for maintenance *and production* in sheep, thus providing more food and calories for man.

Nevertheless the theoretical gain in calories by milling to 100% extraction over that obtained by milling to (say) 85% extraction and feeding the 15% offals to cows is marginal. Thus, consider the case where 300 g. of wheat is available per person. Milled to 100% extraction this will supply 930 calories. Milled to 85% extraction the 255 g. of flour will supply 867 calories, while the 45 g. of offal will supply about 3 oz. of milk containing 52 calories, a total of 919 calories. In the case of a starving population other more practical considerations are however probably of the first importance. Thus (1) the maintenance ration cannot be ignored, and bran can only form part of the production ration; (2) in practice all the offals might not go to cows, and we understand in fact that in Germany, when the extraction was 90%, much of the bran was fed to horses; (3) milling to 100% will tend to secure a more equitable distribution of calories between the urban and rural populations; and (4) though children must have milk, the criticism that it would be better, even with adults, to sacrifice some calories to provide more animal protein is probably not serious, in view of the fact that the German diet, consisting mainly of high-extraction flour, green vegetables, and potatoes, while seriously deficient in calories, is not otherwise basically unsatisfactory.

Under more normal conditions the problem is obviously very different. Granted that bread flour must contain satisfactory levels of the different nutrients, the correct balance must be struck between the extraction-rate of this flour and the supply of wheat offals necessary to provide the milk, eggs, and bacon essential for a palatable diet and the full health of a community. It is in fact clear that under such conditions the extraction-rate need not exceed 80% (*Report of Conference on Post-war Loaf* 1945).

From the few experiments we have carried out, wheat and rye brans appear to behave in much the same way during digestion. It is therefore paradoxical that, though even in Germany 100% extraction is regarded as satisfactory for rye, there was considerable reluctance to exceed 90% extraction for wheat.

WHEAT ECONOMY AND THE EXTRACTION-RATE

Raising the extraction-rate reduces the consumption of wheat. Thus, with no change in the consumption of flour and bread per head, extraction-rates of 85, 90, 95, and 100% will reduce the requirement of wheat, compared with that required at 80% extraction, by 5·6, 11·2, 16, and 20% respectively. There is, however, an invisible reduction in the calorie intake supplied by flour as the extraction-rate is increased. From the figures quoted in

TABLE III—PERCENTAGE OF PROTEIN AFTER DIGESTION STAGES (DRY MATTER BASIS)

Sample	Initial % (N × 5·7)	% after autolysis $^1/_2$ hr. at 37° C	% after ptyalin digestion $^1/_2$ hr. pH 6·0	% after pepsin digestion 4 hr. pH 2·0	% after pancreatin digestion 16 hr. pH 8·0–8·5
I	16·0	15·8	15·70	8·3	6·35
II	15·8	13·0	13·0	8·4	6·10
III	15·1	15·8	20·0	13·4	7·55
IV	14·9	15·8	15·85	12·9	7·90

TABLE IV—PERCENTAGE OF TOTAL INITIAL PROTEIN DISSOLVED OR DIGESTED AFTER EACH STAGE

Sample	Initial protein	Autolysis $^1/_2$ hr.	Ptyalin $^1/_2$ hr.	Pepsin 4 hr.	Pancreatin 16 hr.
I	100 %	16 %	16·5 %	61·5 %	79·5 %
II	100 %	31 %	30·0 %	58·0 %	72·5 %
III	100 %	13 %	12·5 %	49·5 %	76·0 %
IV	100 %	13 %	14·0 %	36·0 %	65·0 %

this paper, loaves made of 100, 95, and 90% extraction flour will on the average only contain 90, 93, and 96% respectively of the available calories contained in a loaf of the same weight made from 80% flour. Further, the higher the extraction, the more water a flour can hold. Thus, whereas at 80% extraction 1 lb. of flour will give about 1·37 lb. of bread, 90, 95, and 100% extraction flours will give 1·40, 1·42, and 1·44 lb. of bread. Even without any reduction in the consumption of bread, therefore, and neglecting the loss of animal foodstuffs due to the reduction in the supply of wheat offals, the effect of raising the extraction from 80% to 90% is to reduce the available calories supplied by bread by 6%.

SUMMARY

The digestibility of a high-extraction flour is governed by the amount of bran it contains.

An analysis of previous work shows that the bran removed in the milling of wheaten flours of extraction higher than 85% has a digestibility (energy) of about 40%.

In-vitro experiments on a cooked clean bran have given a minimal digestibility of 34% (energy).

The in-vitro digestibility of the nitrogen in bran is about 65%.

The process of digestion of bran consists essentially of the absorption of the contents of the aleurone cells.

Apart from any reduction in the consumption of bread, raising the extraction from 80% to 90% has reduced the calories supplied by bread by 6%.

REFERENCES

Borgström, S. (1941) *Acta physiol. scand.* **2**, 1.
Halnan, E. T. (1944) *J. agric. Sci.* **34**, 133.
McCance, R. A. (1946) *Lancet*, i, 77.
— Widdowson, E. M., Moran, T., Pringle, W. J. S., Macrae, T. F. (1945) *Biochem. J.* **39**, 213.
Macrae, T. F., Hutchinson, J. C. D., Irwin, J. O., Bacon, J. S. D. McDougall, E. I. (1942) *J. Hyg., Camb.* **42**, 423.
Moran, T., Pace, J. (1942) *Nature, Lond.* **150**, 225.
Report of Conference on Post-war Loaf (1945) Cmd. 6701, H.M. Stationery Office.

Reviews of Books

Bacillary Dysentery, Colitis, and Enteritis

JOSEPH FELSEN, M.D., director of medical research, Bronx Hospital, New York; director of International and Pan-American Dysentery Registry. London: W. B. Saunders. Pp. 618. 30*s*.

INFLAMMATORY diseases of the small and large intestine make up an important section of general practice, and Dr. Felsen has collected a comprehensive record of our present knowledge of this difficult subject. The progress made during the war years in treatment is well covered, and a reasoned evaluation of sulphonamide therapy in bacillary dysentery leads him to conclude that for general use the combination of a relatively non-absorbable with a freely absorbable sulphonamide—such as succinyl sulphathiazole with sulphadiazine or sulphathiazole—may be more desirable than either type alone. He concludes that the final evaluation of sulphonamide therapy in acute bacillary dysentery awaits "more accurate criteria of cure than those commonly presented in the literature." Over 280 pages are given up to the various aspects of acute bacillary dysentery. Under chronic bacillary dysentery he includes ulcerative colitis and regional ileitis, since he holds the view, for which he gives summarised data, that these diseases all have a common pathogenesis. Much of this argument is controversial, but the evidence is fairly given, and the reader may form his own opinion. Besides serving as a reference book to the specialist, this should prove useful to the practitioner in handling his cases of diarrhœa.

Regional Analgesia

(2nd ed.) H. W. L. MOLESWORTH, F.R.C.S., senior surgeon, Royal Victoria Hospital, Folkestone. London: H. K. Lewis. Pp. 92. 8*s*. 6*d*.

THE alterations in this edition appear to be few, and the book remains a concise account of classical local anæsthetic techniques. While the text may be useful to refresh the memory it is unlikely to be full enough for the serious student. The illustrations are still the book's weak spot: an essentially practical subject cannot be trusted to an amateur artist. In spite of all the efforts of the manufacturers of 'Nupercaine,' the author persists in freely using the term "percaine"—a practice which, by confusing percaine with procaine, has already cost a few lives. Mr. Molesworth is at his best in discussing, in the light of his own experience, the pros and cons of regional anæsthesia, and his opinions, coming as they do from an experienced surgeon, must command respect.

Inheritance of Hare-lip and Cleft Palate

POUL FOGH-ANDERSEN. Translated by Elisabeth Aagesen. Copenhagen: Arnold Busck. Pp. 266.

IN this comprehensive survey of Danish material, the author estimates the number of patients with hare-lip or cleft palate in Denmark to be about 4000, and the natal incidence to be 1·50 per thousand. He accepts hereditary disposition as an essential factor, but points out that only a relatively small number of the previous genetic studies of these conditions are of value in determining the mode of inheritance. From his own studies on 703 patients from the whole of Denmark, he concludes that there are two different malformations with no genetic connexion: (1) hare-lip with or without associated cleft palate, and (2) cleft palate occurring as an isolated malformation. The first is more common in males and the second in females. It was impossible to demonstrate with certainty any ætiological factor (such as geographical distribution, age of parents, or conditions of pregnancy) *other than hereditary disposition.* With both malformations he found that the incidence among relatives far exceeded the average incidence in the whole population; but while most cases of hare-lip (with or without cleft palate) must be assumed to be hereditary, many cases of isolated cleft palate seem to be non-hereditary. Analysis of the pedigrees showed that the most likely interpretation of the manner of inheritance of the hare-lip group was "conditioned dominance" with sex-limitation to males; while isolated cleft palate seemed to be inherited as a simple dominant "with failing manifestation and sex-limitation to females." Dr. Fogh-Andersen discusses the eugenic aspects of both conditions. He does not recommend induced abortion or sterilisation, but thinks that when the chances of hare-lip are high—that is, when one parent and one or more of the children have hare-lip—induced abortion should be agreed to if the parents are anxious for it. Though it does not deal in any detail with other possible factors, such as diet in the early months of pregnancy (which might possibly have a bearing on non-hereditary cases of cleft palate), the book is a valuable foundation for further study of the genetics of hare-lip and cleft palate in other countries.

Vitamins and Hormones

Vol. III. Editors: R. S. HARRIS, associate professor of nutritional biochemistry, Massachusetts Institute of Technology; K. V. THIMANN, associate professor of plant physiology, Harvard University. New York: Academic Press. Pp. 420. $6.50.

THE latest volume of this series maintains the high standard of the others. Any complete survey of this field has become wellnigh impossible, but this work contains well-balanced, critical reviews of special aspects. The contents are not restricted to American work, but include reviews by three British and two Palestinian investigators. Najjar and Barrett, and Daft and Sebrell review the activities of intestinal flora in human and animal nutrition. Thomas Moore discusses the interrelation of vitamins, and B. C. J. G. Knight growth factors in microbiology. A survey of the chemistry of anti-pernicious-anæmia substances of liver reads like a scientific "Edgar Wallace," though unfortunately the final clue still seems to be missing. The gonadotrophic hormones, the relation of acetylcholine to nerve activity, and possibilities in the realm of synthetic œstrogens are well discussed, the last by Professor Dodds, and in a review of outstanding merit on prenatal nutritional deficiency J. Warkany shows that malformations of the fœtus can be brought about by nutritional deficiencies alone, if they occur when tissues needing the deficient factor are in the process of differentiating.

SELECT

SULPHADIAZINE-M&B

Its relatively slow excretion will result in an adequate concentration in the blood being maintained by administration at less frequent intervals than other sulphonamides, and it is remarkably free from cerebral effects. Because of its rather slow absorption, treatment in very acute cases should be initiated by an intravenous injection of SULPHADIAZINE SODIUM—M & B, other sodium sulphonamides or by the oral administration of sulphathiazole.

FOR

chemotherapy in acute infections due to pneumococci, meningococci, haemolytic and other streptococci and Haemophilus ducreyi. Probably the drug of choice for pulmonary and extrapulmonary infections due to Friedländer's pneumobacillus, and is effective in acute urinary tract infections by Bact. coli.

FOR

topical application, a cream and a paste containing 5 per cent. sulphadiazine are available and a sterilized powder for prophylaxis and early treatment of wounds and burns. The eye ointment for topical sulphonamide therapy in ophthalmological practice contains 10 per cent. Sulphadiazine.

TABLETS
Containers of 25 x 0·50 gramme
100 x 0·50 gramme
500 x 0·50 gramme

PASTE
Jars of 1 ounce
16 ounces

CREAM
Jars of 1 ounce
16 ounces

POWDER
Containers of: 25 grammes
100 grammes
500 grammes

STERILIZED POWDER
Containers of: 10 grammes

EYE OINTMENT
Collapsible tubes of 5 grammes

MANUFACTURED BY

MAY & BAKER LTD.

DISTRIBUTORS

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM

9014

this paper, loaves made of 100, 95, and 90% extraction flour will on the average only contain 90, 93, and 96% respectively of the available calories contained in a loaf of the same weight made from 80% flour. Further, the higher the extraction, the more water a flour can hold. Thus, whereas at 80% extraction 1 lb. of flour will give about 1·37 lb. of bread, 90, 95, and 100% extraction flours will give 1·40, 1·42, and 1·44 lb. of bread. Even without any reduction in the consumption of bread, therefore, and neglecting the loss of animal foodstuffs due to the reduction in the supply of wheat offals, the effect of raising the extraction from 80% to 90% is to reduce the available calories supplied by bread by 6%.

SUMMARY

The digestibility of a high-extraction flour is governed by the amount of bran it contains.

An analysis of previous work shows that the bran removed in the milling of wheaten flours of extraction higher than 85% has a digestibility (energy) of about 40%.

In-vitro experiments on a cooked clean bran have given a minimal digestibility of 34% (energy).

The in-vitro digestibility of the nitrogen in bran is about 65%.

The process of digestion of bran consists essentially of the absorption of the contents of the aleurone cells.

Apart from any reduction in the consumption of bread, raising the extraction from 80% to 90% has reduced the calories supplied by bread by 6%.

REFERENCES

Borgström, S. (1941) *Acta physiol. scand.* **2**, 1.
Halnan, E. T. (1944) *J. agric. Sci.* **34**, 133.
McCance, R. A. (1946) *Lancet*, i, 77.
— Widdowson, E. M., Moran, T., Pringle, W. J. S., Macrae, T. F. (1945) *Biochem. J.* **39**, 213.
Macrae, T. F., Hutchinson, J. C. D., Irwin, J. O., Bacon, J. S. D. McDougall, E. I. (1942) *J. Hyg., Camb.* **42**, 423.
Moran, T., Pace, J. (1942) *Nature, Lond.* **150**, 225.
Report of Conference on Post-war Loaf (1945) Cmd. 6701, H.M. Stationery Office.

Reviews of Books

Bacillary Dysentery, Colitis, and Enteritis

JOSEPH FELSEN, M.D., director of medical research, Bronx Hospital, New York; director of International and Pan-American Dysentery Registry. London: W. B. Saunders. Pp. 618. 30*s*.

INFLAMMATORY diseases of the small and large intestine make up an important section of general practice, and Dr. Felsen has collected a comprehensive record of our present knowledge of this difficult subject. The progress made during the war years in treatment is well covered, and a reasoned evaluation of sulphonamide therapy in bacillary dysentery leads him to conclude that for general use the combination of a relatively non-absorbable with a freely absorbable sulphonamide—such as succinyl sulphathiazole with sulphadiazine or sulphathiazole—may be more desirable than either type alone. He concludes that the final evaluation of sulphonamide therapy in acute bacillary dysentery awaits "more accurate criteria of cure than those commonly presented in the literature." Over 280 pages are given up to the various aspects of acute bacillary dysentery. Under chronic bacillary dysentery he includes ulcerative colitis and regional ileitis, since he holds the view, for which he gives summarised data, that these diseases all have a common pathogenesis. Much of this argument is controversial, but the evidence is fairly given, and the reader may form his own opinion. Besides serving as a reference book to the specialist, this should prove useful to the practitioner in handling his cases of diarrhœa.

Regional Analgesia

(2nd ed.) H. W. L. MOLESWORTH, F.R.C.S., senior surgeon, Royal Victoria Hospital, Folkestone. London: H. K. Lewis. Pp. 92. 8*s*. 6*d*.

THE alterations in this edition appear to be few, and the book remains a concise account of classical local anæsthetic techniques. While the text may be useful to refresh the memory it is unlikely to be full enough for the serious student. The illustrations are still the book's weak spot: an essentially practical subject cannot be trusted to an amateur artist. In spite of all the efforts of the manufacturers of 'Nupercaine,' the author persists in freely using the term "percaine"—a practice which, by confusing percaine with procaine, has already cost a few lives. Mr. Molesworth is at his best in discussing, in the light of his own experience, the pros and cons of regional anæsthesia, and his opinions, coming as they do from an experienced surgeon, must command respect.

Inheritance of Hare-lip and Cleft Palate

POUL FOGH-ANDERSEN. Translated by Elisabeth Aagesen. Copenhagen: Arnold Busck. Pp. 266.

IN this comprehensive survey of Danish material, the author estimates the number of patients with hare-lip or cleft palate in Denmark to be about 4000, and the natal incidence to be 1·50 per thousand. He accepts hereditary disposition as an essential factor, but points out that only a relatively small number of the previous genetic studies of these conditions are of value in determining the mode of inheritance. From his own studies on 703 patients from the whole of Denmark, he concludes that there are two different malformations with no genetic connexion: (1) hare-lip with or without associated cleft palate, and (2) cleft palate occurring as an isolated malformation. The first is more common in males and the second in females. It was impossible to demonstrate with certainty any ætiological factor (such as geographical distribution, age of parents, or conditions of pregnancy) other than hereditary disposition. With both malformations he found that the incidence among relatives far exceeded the average incidence in the whole population; but while most cases of hare-lip (with or without cleft palate) must be assumed to be hereditary, many cases of isolated cleft palate seem to be non-hereditary. Analysis of the pedigrees showed that the most likely interpretation of the manner of inheritance of the hare-lip group was "conditioned dominance" with sex-limitation to males; while isolated cleft palate seemed to be inherited as a simple dominant "with failing manifestation and sex-limitation to females." Dr. Fogh-Andersen discusses the eugenic aspects of both conditions. He does not recommend induced abortion or sterilisation, but thinks that when the chances of hare-lip are high—that is, when one parent and one or more of the children have hare-lip—induced abortion should be agreed to if the parents are anxious for it. Though it does not deal in any detail with other possible factors, such as diet in the early months of pregnancy (which might possibly have a bearing on non-hereditary cases of cleft palate), the book is a valuable foundation for further study of the genetics of hare-lip and cleft palate in other countries.

Vitamins and Hormones

Vol. III. Editors: R. S. HARRIS, associate professor of nutritional biochemistry, Massachusetts Institute of Technology; K. V. THIMANN, associate professor of plant physiology, Harvard University. New York: *Academic Press*. Pp. 420. $6.50.

THE latest volume of this series maintains the high standard of the others. Any complete survey of this field has become wellnigh impossible, but this work contains well-balanced, critical reviews of special aspects. The contents are not restricted to American work, but include reviews by three British and two Palestinian investigators. Najjar and Barrett, and Daft and Sebrell review the activities of intestinal flora in human and animal nutrition. Thomas Moore discusses the interrelation of vitamins, and B. C. J. G. Knight growth factors in microbiology. A survey of the chemistry of anti-pernicious-anæmia substances of liver reads like a scientific "Edgar Wallace," though unfortunately the final clue still seems to be missing. The gonadotrophic hormones, the relation of acetylcholine to nerve activity, and possibilities in the realm of synthetic œstrogens are well discussed, the last by Professor Dodds, and in a review of outstanding merit on prenatal nutritional deficiency J. Warkany shows that malformations of the fœtus can be brought about by nutritional deficiencies alone, if they occur when tissues needing the deficient factor are in the process of differentiating.

THE LANCET

LONDON: SATURDAY, JULY 27, 1946

The Cult of the Obsolete

DURING the great inter-war housing drive many improvements were introduced in the equipment of dwellings. Electric lighting became almost universal, and cooking by gas or electricity made headway in urban areas. Even solid-fuel stoves showed some advance in design beyond the rapacious kitchen range, and primitive types of water-heating found their way into a large number of homes. Nevertheless, these permanent dwellings were already obsolete in design and structure when they were built. The design belonged to a period when a house was conceived as a group of enclosed spaces called rooms, each of which could be independently heated by a fire. This presupposed the existence of a class of servants who carried coals and took away slops. In the homes of working people there were no servants; but this did not worry the builder. He merely retained the traditional design, reduced the number and size of the boxes called rooms, and continued to provide the massive fireplaces and chimneys of the larger houses. He just compressed the design and cheapened the structure without paying any serious attention to the needs of the user. The structure also remained faithful to tradition, and modern fittings were stowed away in any hole and corner. Little notice was taken of the needs or the comfort of those who had to live in the houses, and first cost always took precedence over efficiency and economy in maintenance.

Before the outbreak of the second world war our more expensive houses had begun to adopt many of the technical improvements in comfort conditions which had already become a commonplace in progressive countries. Central heating, abundant hot water, refrigerators, and even efficient insulation arrived hand in hand with modern kitchen and bathroom equipment. The invasion by comfort, however, was stoutly resisted in the older mansions; and it did not reach the houses built for the workers, whether under subsidy or otherwise. The domination of "practical" interests over life-needs was unassailable. During the war period the grim demands of the struggle put an end to house building, but at the same time stimulated magnificent technical achievements in the use of materials, construction, and equipment. The changeover from war to peace does not, as a recent circular from the Ministry of Health seems to suggest, necessitate the return to obsolete pre-war appliances and methods of construction in new permanent houses. On the contrary, it is clear that with effort and good will a large proportion of war-time technical advances are readily adaptable to peace-time uses without any time-lag. Many of the structural materials devised in war have immediate practical uses in the housing of today; much of the desirable equipment and many appliances are already on the production line. Scientists are eager to provide efficient substitutes for materials that are scarce. Heating and ventilating engineers are ready with new designs of appliances that will secure economy of fuel with increased efficiency and labour-saving to the housewife. The knowledge is ours; the necessary materials are within reach; but effort and good will are lacking.

Let us take a few examples at random. Some well-known insulating materials are admittedly scarce, but efficient substitutes can be produced in abundance; wall linings of low thermal capacity make for fuel economy and comfort. It costs no more to introduce technically sound plumbing, with good insulation of hot-water pipes, tanks, and cisterns, than to arrange festoons of pipes under the eaves where the first frost of winter will cause misery and perhaps lead to irretrievable damage. It is common knowledge that a hot-water cistern ought to hold at least 40 gallons, that its height should be three times as great as its diameter, and that it must be well lagged if it is to be efficient; yet in the houses of today hundreds of cubical cisterns with a capacity of 25 gallons are crawling unlagged into their dusty caves. The "heat service unit" devised for small houses by the engineers of the Ministry of Works and by some private firms is economical in material and production, efficient, and in the long run cheap for the tenant; yet antiquated open fireplaces and pathetically inefficient stoves are still going into new houses, like funeral processions during a plague. It is not as if alterations to conform with modern views could easily be made later—the heavy brickwork for obsolete flues has all the qualities of permanence. Domestic lighting by electricity has not kept pace with invention. With good lighting one should hardly be aware of the source of light, and there should be extensive diffusion with very little shadow. These requirements are well met by fluorescent tubes placed centrally close to the ceiling. Additional points are necessary for other uses, such as a table lamp or an electric iron, and of course provision should be made independently for the wireless set. It is technically a simple matter to standardise electric sockets while leaving scope for taste in their coverings; but legions of diverse sizes flood the market, to the mighty irritation of the housewife. It is the same story with innumerable other household fittings: standard specifications have been produced, and are available to all. They represent the best and the most efficient types that can be made, and they are constantly being adapted to new advances in the various crafts. But the demand for the obsolete continues unabated, and no authoritative body seems to be willing to impose any check. We know, for example, that the best type of water-closet pan is the siphonic, with the low-level cistern. Why do we not get them produced in mass in place of the inferior patterns that flood the market today?

These are casual illustrations of a wrong system—the extravagant production of obsolete housing materials and equipment, in the face of modern knowledge. It is nonsense to suggest that we must be content to wait for some undefined period before putting a stop to waste and inefficiency. Aircraft production in war did not cling to the past, or we should have lost the war. Yet there the difficulties of keeping up with technical advance were incomparably greater than with the simple materials for comfort in the home. Expense is not the hindrance. It is largely invincible ignorance and want of the will to do better.

Gentle, Palatable & Efficient

Lixen is an extract of senna pods prepared by a special cold process to allay the griping action. The absence of an after-constipating effect gives it a special value in habitual constipation, and its gentle, though efficient, action, together with its pleasant flavour, makes it particularly acceptable to women, children, elderly and delicate persons, and convalescents, for whom the finding of a satisfactory aperient is often difficult.

Lixen Elixir, containing in each 100 c.c. the water soluble extractive of 50 grammes of senna pods, is supplied in bottles of 4 oz. 2/3, 8 oz. 3/11, and 40 and 80 oz. for dispensing.

Lixen Laxative Lozenges. Each Lozenge contains the water soluble extractive of 15 grains of senna pods, and is supplied in bottles of 30, 1/8, and 500 for dispensing.

Prices include Purchase Tax.

LIXEN

THE GOOD-NATURED LAXATIVE

ALLEN & HANBURYS LTD. • LONDON • E.2
PHONE: BISHOPSGATE 3201 (12 LINES). WIRES: "GREENBURYS, BETH, LONDON"

THE LANCET

LONDON: SATURDAY, JULY 27, 1946

The Cult of the Obsolete

DURING the great inter-war housing drive many mprovements were introduced in the equipment of wellings. Electric lighting became almost universal, nd cooking by gas or electricity made headway in rban areas. Even solid-fuel stoves showed some dvance in design beyond the rapacious kitchen range, nd primitive types of water-heating found their way nto a large number of homes. Nevertheless, these ermanent dwellings were already obsolete in design nd structure when they were built. The design belonged to a period when a house was conceived as a roup of enclosed spaces called rooms, each of which ould be independently heated by a fire. This preupposed the existence of a class of servants who arried coals and took away slops. In the homes of working people there were no servants; but this did not worry the builder. He merely retained the raditional design, reduced the number and size of the boxes called rooms, and continued to provide the massive fireplaces and chimneys of the larger houses. He just compressed the design and cheapened the structure without paying any serious attention to the needs of the user. The structure also remained faithful to tradition, and modern fittings were stowed away in any hole and corner. Little notice was taken of the needs or the comfort of those who had to live in the houses, and first cost always took precedence over efficiency and economy in maintenance.

Before the outbreak of the second world war our more expensive houses had begun to adopt many of the technical improvements in comfort conditions which had already become a commonplace in progressive countries. Central heating, abundant hot water, refrigerators, and even efficient insulation arrived hand in hand with modern kitchen and bathroom equipment. The invasion by comfort, however, was stoutly resisted in the older mansions; and it did not reach the houses built for the workers, whether under subsidy or otherwise. The domination of "practical" interests over life-needs was unassailable. During the war period the grim demands of the struggle put an end to house building, but at the same time stimulated magnificent technical achievements in the use of materials, construction, and equipment. The changeover from war to peace does not, as a recent circular from the Ministry of Health seems to suggest, necessitate the return to obsolete pre-war appliances and methods of construction in new permanent houses. On the contrary, it is clear that with effort and good will a large proportion of war-time technical advances are readily adaptable to peace-time uses without any time-lag. Many of the structural materials devised in war have immediate practical uses in the housing of today; much of the desirable equipment and many appliances are already on the production line. Scientists are eager to provide efficient substitutes for materials that are scarce. Heating and ventilating engineers are ready with new designs of appliances that will secure economy of fuel with increased efficiency and labour-saving to the housewife. The knowledge is ours; the necessary materials are within reach; but effort and good will are lacking.

Let us take a few examples at random. Some well-known insulating materials are admittedly scarce, but efficient substitutes can be produced in abundance; wall linings of low thermal capacity make for fuel economy and comfort. It costs no more to introduce technically sound plumbing, with good insulation of hot-water pipes, tanks, and cisterns, than to arrange festoons of pipes under the eaves where the first frost of winter will cause misery and perhaps lead to irretrievable damage. It is common knowledge that a hot-water cistern ought to hold at least 40 gallons, that its height should be three times as great as its diameter, and that it must be well lagged if it is to be efficient; yet in the houses of today hundreds of cubical cisterns with a capacity of 25 gallons are crawling unlagged into their dusty eaves. The "heat service unit" devised for small houses by the engineers of the Ministry of Works and by some private firms is economical in material and production, efficient, and in the long run cheap for the tenant; yet antiquated open fireplaces and pathetically inefficient stoves are still going into new houses, like funeral processions during a plague. It is not as if alterations to conform with modern views could easily be made later—the heavy brickwork for obsolete flues has all the qualities of permanence. Domestic lighting by electricity has not kept pace with invention. With good lighting one should hardly be aware of the source of light, and there should be extensive diffusion with very little shadow. These requirements are well met by fluorescent tubes placed centrally close to the ceiling. Additional points are necessary for other uses, such as a table lamp or an electric iron, and of course provision should be made independently for the wireless set. It is technically a simple matter to standardise electric sockets while leaving scope for taste in their coverings; but legions of diverse sizes flood the market, to the mighty irritation of the housewife. It is the same story with innumerable other household fittings: standard specifications have been produced, and are available to all. They represent the best and the most efficient types that can be made, and they are constantly being adapted to new advances in the various crafts. But the demand for the obsolete continues unabated, and no authoritative body seems to be willing to impose any check. We know, for example, that the best type of water-closet pan is the siphonic, with the low-level cistern. Why do we not get them produced in mass in place of the inferior patterns that flood the market today?

These are casual illustrations of a wrong system—the extravagant production of obsolete housing materials and equipment, in the face of modern knowledge. It is nonsense to suggest that we must be content to wait for some undefined period before putting a stop to waste and inefficiency. Aircraft production in war did not cling to the past, or we should have lost the war. Yet there the difficulties of keeping up with technical advance were incomparably greater than with the simple materials for comfort in the home. Expense is not the hindrance. It is largely invincible ignorance and want of the will to do better.

Gentle, Palatable & Efficient

Lixen is an extract of senna pods prepared by a special cold process to allay the griping action. The absence of an after-constipating effect gives it a special value in habitual constipation, and its gentle, though efficient, action, together with its pleasant flavour, makes it particularly acceptable to women, children, elderly and delicate persons, and convalescents, for whom the finding of a satisfactory aperient is often difficult.

Lixen Elixir, containing in each 100 c.c. the water soluble extractive of 50 grammes of senna pods, is supplied in bottles of 4 oz. 2/3, 8 oz. 3/11, and 40 and 80 oz. for dispensing.

Lixen Laxative Lozenges. Each Lozenge contains the water soluble extractive of 15 grains of senna pods, and is supplied in bottles of 30, 1/8, and 500 for dispensing.

Prices include Purchase Tax.

LIXEN

THE GOOD-NATURED LAXATIVE

ALLEN & HANBURYS LTD • LONDON • E2
PHONE: BISHOPSGATE 3201 (12 LINES). WIRES: "GREENBURYS, BETH, LONDON"

to be anticipated from existing knowledge of the action of X rays and gamma rays.

In addition to these injuries, which became apparent within a few days or at most a few months after the bombing, other harmful effects are to be anticipated which will appear only in later generations. These are genetic changes, induced by the radiation in the germ cells of survivors and handed on to their offspring. A discussion at the British Institute of Radiology in May,[2] with Prof. J. B. S. HALDANE, F.R.S., in the chair, made it clear that, while the production of mutations by radiation in man has not been demonstrated, there is no reason to doubt that it can occur. There is evidence that radiation induces mutation in a considerable number of plant and animal species, including mice. Two principal types are recognised—gene mutation and chromosome mutation. The former involves no detectable change in the microscopical appearance of the chromosomes and is presumed to be due to internal change in a gene; the latter involves rearrangement of existing genes by, for example, an exchange of segments between two chromosomes, and may be detectable microscopically. The commonest radiation-induced mutations in mice are of the chromosome type and their effect is to cause hereditary partial sterility. When a male or female mouse has been irradiated with neutrons or X rays in a dosage of a few hundred röntgens, some of its offspring will consistently produce small litters. About half the members of these small litters, when reared and mated to normal mice, will in turn give rise to small litters, and so on, the effect being transmitted to about half the offspring in each generation. The small litter size is due to a proportion of the fertilised eggs dying, either before implantation in the uterus or as embryos in the uterus. If this effect exists with human beings, it may show itself as a hereditary tendency to miscarriage.

This hereditary partial sterility is produced when mature sperm are irradiated, but the effect on immature sperm is much slighter, so the maximum degree of chromosome mutation is obtained only if mating takes place within a few days of irradiation. Gene mutations, on the other hand, are produced about as readily in immature as in mature germ cells; consequently the offspring conceived of one of the parents at any time after irradiation may be expected to carry mutant genes. Offspring which receive a mutant gene from one parent will usually receive the corresponding gene in the normal form from the other parent, and since mutant genes are often recessive to the normal type the effect of the mutant gene is concealed. Eventually, after a greater or lesser number of generations (depending on the degree of inbreeding, but possibly of the order of a hundred generations), a conception may occur in which both egg and sperm contribute the same mutant gene, and the mutation will then show itself in the resulting organism. Thus a considerable time is likely to elapse between the production of a recessive mutation and the appearance of a visibly abnormal person. Mutants which are not recessive to the normal type (and this is the case with many of the known human mutants), and mutant genes carried in the sex chromosomes, will show up in the offspring of irradiated people and will not remain hidden for many generations.

The vast majority of mutations are deleterious, and the production of mutations is undoubtedly to be included among the harmful effects of the atom bomb. To assess the magnitude of the effect is, however, only possible if one is prepared to make guesses which while plausible may be wrong. The mutation-rate in experimental material is of the order of 3×10^{-8} per gene per röntgen. The spontaneous rate of mutation in man in the case of two known mutations is about 10^{-5} per gene per generation, or say 4×10^{-7} per gene per year. Thus a dose of about 10 r probably produces as many mutations as occur spontaneously in a year, and in the germ cells of the survivors of the atom bomb as many mutations were probably produced as would arise spontaneously in several years. Considerations of this kind are also relevant in planning peace-time applications of atomic energy which might involve greater numbers of people than have hitherto run the risk of exposure to radiation.[3] It is now thought that X-ray and radium workers can tolerate about 1 r per week without injury to health. So long as only a minute fraction of the whole population is exposed to radiation, doses of this order will not increase the mutation-rate in the population as a whole by any significant proportion. But if developments in nuclear physics lead to a considerable fraction of the population running the risk of exposure to radiation, it will be necessary to reduce the "tolerance" dose much below that figure. If, for example, the whole population were exposed to 1 r per week, then the mutation-rate would probably be increased several fold above the spontaneous rate, resulting eventually in a great increase in hereditary abnormalities. Fortunately the authorities are alive to these dangers and to the necessity for obtaining further information on the production of hereditary changes by radiation in mammals.[4]

B.C.G.

ON July 17 a deputation from the Tuberculosis Association, the Joint Tuberculosis Council, and the National Association for the Prevention of Tuberculosis went to the Ministry of Health to present the memorandum by Prof. W. H. Tytler, which we summarise on p. 138. They asked that B.C.G. vaccine should be made available for trial in this country. Sir Wilson Jameson, chief medical officer of the Ministry, who received the deputation with sympathy, indicated his willingness to see whether suitable vaccine can be provided. To determine its use, and the class of persons to be immunised, it would, he thought, be necessary to appoint an expert committee.

---

[2] *Nature, Lond.* 1946, 157, 738.

[3] Wiesner, B. P. *Lancet*, 1946, i, 33; Walker, K. M. *Ibid*, p. 69.

[4] Dale, H. H. *Ibid*, p. 399.

"... If there is a valid criticism to be made of the Civil Service at the present time, it is that it does not always fully appreciate the point of view of the public and does not always have that sense of urgency which we would wish it to have. The obvious remedy is to recruit civil servants from men who have been at the receiving end of Ministry letters. They will, then, have a different outlook and a greater sense of urgency. ... We are no longer under the kind of system in which the Civil Service first developed, in which its chief rôle was to stop other people from doing things. The Civil Service is increasingly having a planned and positive rôle to play, and we may need to go much further than we have done during the war in bringing in men of business, scientific, and technical experience of every kind."—Mr. H. D. HUGHES in the House of Commons on June 21.

It would be idle to lay the blame on any one authority or group of persons—producer or consumer. We are all to blame.

Prospects in Poliomyelitis

LACK of epidemiological knowledge is not the only obstacle to an effective control of poliomyelitis. BURNET[1] maintains that we already know enough about this disease, in which undetectable carriers and mild for the most part undiagnosable infections far outnumber the obvious cases, to see that control is impracticable and that the only useful preventive measure is to prohibit tonsillectomy in times of epidemic prevalence. This is a pessimistic view but it is the carefully considered opinion of an acknowledged authority on virus diseases.

It is not customary for doctors openly to admit defeat. The practitioner often prescribes a placebo to give an anxious patient the impression that something useful is being done when in fact nature is being left to take her course. Routine disinfection, admittedly for the sake of appearances, is still an accepted part of public-health practice in dealing with some infectious diseases. DEENY and MACCORMACK,[2] who lately described in these columns the measures employed to deal with outbreaks of poliomyelitis in Eire, disarmingly made no claim that the scheme applied, which included quarantine of contacts, school closure, water chlorination, and destruction of flies, had any effect on the spread of the disease. They merely recorded that in their experience communities rendered anxious by the prevalence of poliomyelitis will submit to any scheme, however troublesome, provided there is a strong suggestion that it will afford protection. They expressed the opinion that the reassuring effect of such control measures "established their psychological worth." If, however, this was all that could be expected of them, their use would be barely justifiable.

Some of the measures advocated for the control of poliomyelitis need very careful consideration before they are applied on a large scale without more justification than that of the placebo. A committee of experts which recently advised[3] on poliomyelitis in boarding-schools was noticeably guarded in its attitude to the quarantine of contacts. Except in residential communities like boarding-schools, and in families of easy financial circumstances, quarantine measures are difficult to apply. There is no means of enforcing them and no solution to the problem of compensation for loss of earnings which at once arises when a quarantine of adult contacts is attempted in the ordinary household. Another measure which cannot be lightly undertaken is the closure of day-schools. This is more likely to limit spread in rural than in urban areas, where, unless local housing conditions are well above average, it is almost impossible to prevent the aggregation of children who are not attending school into groups affording excellent opportunities for the spread of a virus which is infective by casual contact. It was found in Australia in 1937 that the decline of an outbreak which began and reached a peak during school holidays was not interrupted when the day-schools reopened. It has been shown that the chlorination of water-supplies in a manner effective against bacterial pollution does not destroy the virus of poliomyelitis. The prevalence of poliomyelitis is not therefore of itself a good reason for precautionary chlorination of the water-supply; moreover, to prevent the spread of the virus by household utensils it is more logical to use boiling or steam sterilisation than chlorinated or other disinfectant rinses. Regarding the extensive use of D.D.T. for the destruction of flies in an attempt to control poliomyelitis it may be noted that a definite relation between flies infected by excreta or sewage and the spread of the disease among human beings has not yet been established. In this country there is often a high incidence of poliomyelitis during the late autumn and early winter when there are no flies about.

So there are grounds for the view that at present the chances of preventing poliomyelitis are remote, and that this tragic disease must be accepted as a risk inseparable from social life in human communities. But even the pessimist would not think it futile to probe still further into the epidemiology—to seek, for instance, a satisfactory explanation of the well-marked seasonal incidence of poliomyelitis. The prospects are perhaps better in the field of immunology, and it seems reasonable to forecast that the disease will in the end be robbed of its virulence if not of its powers of spread.

Genetic Effects of Atom Bombs

IN the atom bombs which exploded a few hundred metres above Hiroshima and Nagasaki, a kilogramme or so of uranium 235 or plutonium 239 underwent fission, with the production of about 10^{21} ergs of energy. Part of this energy was expended in the blast which caused the material damage to buildings, part was dissipated as hot air, and an appreciable proportion was emitted as radiation. The radiation which reached the ground comprised (*a*) visible, infra-red, and ultraviolet light, resembling sunlight but of much higher intensity, (*b*) neutrons, and (*c*) gamma rays resembling the penetrating rays used in radium therapy or supervoltage X-ray therapy. The visible and near-visible light produced burns on the unprotected skin of people exposed to the flash, but since such radiation is not penetrating it does not directly damage deeper tissues. Neutrons and gamma rays are capable of penetrating to all parts of the body, and substantial thicknesses of building material are required to protect against them. According to the official report,[1] injuries due to penetrating radiation should mainly be ascribed to gamma rays rather than neutrons. The gamma-ray emission from the bomb was perhaps equivalent to 10^{11} curie-hours of radium, and appears to have produced at the ground a dose of the order of 1000 r at one kilometre from the centre of damage, and 10 r at three kilometres. Injuries suffered by people exposed to the gamma rays, as described in the official report, include damage to the hæmopoietic system resulting in anæmia, and damage to reproductive organs shown by reduction in sperm counts and miscarriages in pregnant women. All these types of injury were

---

1. Burnet, F. M. *State of Victoria, Dept. of Health Bulletin*, Jan.–June, 1945.
2. Deeny, J., MacCormack, J. D. *Lancet*, July 6, 1946, p. 8.
3. *Ibid*, 1946, i, 972.

1. Effects of the Atomic Bombs at Hiroshima and Nagasaki. London. 1946. See *Lancet*, July 6, 1946, p. 14.

peramental components, viscerotonia, somatonia, and cerebrotonia, which correspond to the three main body types. The relationship between the different somatotypes and carefully assessed and established bodily disease provides a fruitful field for research. But if this study is to attain the dignity of a science full consideration must be given to every environmental factor, both physical and socio-economic.

AVOIDABLE CANCER

THOUGH cancer of the scrotum contributes less than 8% of the deaths caused annually by cancer of the skin, there were 1335 scrotal cancers out of 3333 notified cases of occupational skin cancer between 1920 and 1943. More than half of these (793) occurred among cotton mule spinners who come into contact with mineral lubricating-oil. The remainder of the 3333 cases were distributed over a wide variety of trades falling naturally into two main groups, in one of which there is contact with pitch, tar, and bitumen and in the other with shale and mineral oils. That this is not the whole story of carcinogenic agents and occupation is indicated by Henry's prodigious investigations[1] of the occupational histories of people whose deaths were notified to the Registrar-General as caused by cancer of the scrotum. He gives his results in a table which lists 101 separate occupations, together with proved or suspected carcinogens such as mineral oil, tar, pitch, soot, creosote, arsenic, and "heat with radiations." The estimated incidence in the populations at risk shows that scrotal cancer is highest in chimney sweeps; then come patent fuel workers, cotton mule spinners, textile spinners, and tar distillery workers, in that order. Surprising information is obtained when a case is fully investigated. "It was naturally interesting," writes Henry, "to expose the parish clerk as a gasworks stoker; the mineral-water manufacturer, the traveller in vinegar, and the musician as cotton mule spinners . . . the grocer as a patent fuel worker . . . the general labourer as a chimney sweep; these discoveries giving the answer to the problem." But he experienced even greater interest and a healthy feeling of frustration when he found that the fish porter was a conjuror, the cotton warehouseman a pugilist, and a painter an ex-acrobat—revelations which threw no light on the problem. It was not until the inquiry was under way that he began to appreciate fully the possibilities of medicinal treatment (e.g., by arsenic) as a cause of cancer, and he hopes that others will follow up this line of investigation.

Henry admits that the best method of preventing scrotal cancer is to use a non-carcinogenic material in industry instead of a carcinogenic one, but unfortunately he emphasises the practical difficulties of choosing the correct oil and of obtaining enough of it. Presumably there are shipping and other difficulties at present, but we wish he had thrown official caution to the wind and come down heavily for the prohibition of mineral oil as a lubricant for cotton mule spinning-machines. These machines used to be lubricated with sperm and neatsfoot oils, and it was only after the introduction of mineral oils that cases of mule-spinners' cancer began to appear. It is hard to believe that such a simple preventive measure as the use of non-carcinogenic oils could not be adopted. As far as is known vegetable oils are not carcinogenic, and in normal times they are not scarce, though possibly they are more costly than mineral oils. There is greater difficulty in controlling the dusts of tar and pitch, and for many purposes substitutes cannot be found.

It is odd that the products of coal and petrol which have lain under the earth for centuries should have carcinogenic properties whereas products of living plants have not. Henry looks back to the time of Pott, and the discovery of chimney sweeps' cancer; and he wishes for a magic carpet to take us back 200 years to find out what was the incidence of scrotal cancer in those days, and forward to the time when the deposits of coal and petrol have been consumed, to see whether there will still be scrotal cancers. He ends with an apt quotation from George Moore: "In two hundred years there will be fields where today there are cinder heaps. . . . But coal and petrol are not endless even in America; and as soon as both are among the gone, the world will start on a new race again."

MILK INDUSTRIES COMPARED

THE mission that has been studying milk-production in North America[1] says that there, as here, the milk industry is largely based on the family farm carrying 15–30 *milking cows; and economists hold that larger units are not inherently more efficient.* By trade-union standards the family is grossly overworked, and the hired farm-worker receives only about half the reward of the milk roundsman, although his work is certainly more exacting and more skilled. In general, the pastures are inferior to those in Britain, but maize-corn and lucerne are important fodder-crops which might have more attention in this country. In most of the Eastern States nearly all the farms have electrical equipment, and the mission thinks that a supply of electricity would provide the greatest single improvement on our dairy-farms. (On many of them, however, a proper water-supply is needed more.) Steam sterilisation of utensils and milking machines is less common than in Great Britain: chlorine disinfectants and lye solution (0·5% NaOH) are used, and special attention is paid to cooling of milk which is done by standing churns in cooling tanks. In addition, all milk is pasteurised when it reaches the depots. The health authorities are finally responsible for hygienic standards, but much of the milk-testing is done by the large dairy firms. Milking-parlours are still in the experimental stage. The price of milk is related to its butter-fat content and "Golden Guernsey milk" brings a higher return to the producer. The mission strongly recommends that a similar scheme, or one related to the total solids, should be introduced in Great Britain; but otherwise they believe that the milk-contract system in this country is much superior to those in America. In a land of domestic refrigerators milk may be delivered only once every two days, and much of it is bought from shops in cartons.

The report shows that production of milk is probably more efficient than it is here. The average annual yield of cows is about 100 gallons (approximately 15%) higher than in Britain and replacement costs are lower. The higher yield has been largely achieved by using Holstein Friesian cattle, which give the best return even though payment is made on a butter-fat basis, and by a more consistent policy of breeding for high milk-production. Long-term experiments at Beltsville are indicating that the use of proven sires (known to throw heifers giving high yields) is as effective as intricate line-breeding programmes for raising milk-yields, and artificial insemination enables the best use to be made of proven bulls. The mission advocates further breeding research in this country and more use of artificial insemination in order to develop single-purpose dairy animals. In his classical work on breeding dairy cattle, however, Prentice[2] emphasised that the beef qualities of dairy cows may, under certain conditions, be an important factor in the economics of dairying, and the Shorthorn is still widely used in the less intensive dairying districts

---

[1] Henry, S. A. Cancer of the Scrotum in Relation to Occupation. London: Oxford University Press. Pp. 112. 15s.

[1] Agriculture Overseas. Report no. 1: Milk in North Americ H.M. Stationery Office. 1946. Pp. 64. 1s. 3d.

[2] Prentice, E. P. American Dairy Cattle. New York and Londo 1942. Pp. 453.

Annotations

BRAN AS FOOD FOR MAN

THE so-called competition of man and animals for food has been one of the nutritional controversies of the war. The subject of debate is whether certain cereals are most advantageously and economically consumed by man directly or after animals have converted them into protein and fat. The question has a qualitative and a quantitative aspect—it is concerned particularly with the quantity of energy and the quality as well as the quantity of protein obtained in the two ways. If the diet contains a moderate variety of foodstuffs, the quality of the protein in one of them is not of great importance, so it is primarily on the quantity of energy obtainable that opinions differ.

At first sight one would think there must be less waste if the food goes straight to man without being first put through another organism, but the animals in question are ruminants whose interiors treat the food in a way totally different from man's, and the foodstuff in question is the wheat grain which the modern miller can fractionate in an indefinite number of ways to yield products of different nutritive value. The argument is not about the finer fractions of the wheat grain—these by general agreement go to man—but about the destiny of the coarse fractions. Only in an emergency such as the present would most nutritionists insist on giving the coarse bran to man, since he does not digest a large part of it whereas the ruminant can use much more for the peculiar fermentative activities which are promoted by micro-organisms in its alimentary canal.

Several valuable inquiries[1] were made during the war into the ability of the human subject to digest bread baked from flour containing various proportions of the wheat grain, and satisfactory answers, based on scientific fact, were obtained; but the coarse bran, as a separate fraction, did not lend itself to such studies, nor was the project of diverting it from cattle to human beings seriously considered in this country until the world famine in cereals became acute. The digestibility of the coarse bran has now been worked out (p. 119) by Mr. R. G. Booth, PH.D., and Mr. T. Moran, D.SC., of the Cereals Research Station at St. Albans, which during the war was in the charge of the Ministry of Food but has since reverted to its original owners, the Research Association of British Flour Millers. They have calculated the digestibility of the bran from the results of the war-time trials already referred to, and have also made experiments in vitro in which cooked and cleaned bran was subjected to treatments planned to imitate as faithfully as possible the processes of salivary, acid gastric, and alkaline intestinal digestion in man. The proportion of solids removed from the coarse bran by human digestion was found to be 40% by calculation and 34% by experiment—values near enough to support one another. It was noted that the cells of the aleurone layer of the bran were emptied by the process of digestion in vitro. The aleurone layer, of which the protein is thought to have especially high nutritive value, adheres so firmly to the bran that it is not removed by any ordinary milling process, and if it is desired that man shall receive it he must receive also the coarse bran to which it is attached. In any but an excessively restricted diet, however, it is not of prime nutritional importance that man should receive the protein of the aleurone layer.

From the figures thus obtained for the digestibility of the coarse bran, Dr. Booth and Dr. Moran have computed the yield from 100 g. of bran to be 118 calories as milk from the cow, or 140 calories as food direct to man. Several complicating factors in human economy and animal husbandry have to be considered, but the balance seems clearly in favour of giving the bran directly to the human population in a famine emergency. The investigations "provide evidence that, where calories are the only concern, the optimal extraction of wheat" (for man, of course) "is 100%." Nevertheless the calories supplied by a loaf of given weight fall as the percentage extraction of the flour used rises, chiefly owing to the decreasing digestibility of the flour but partly also because of the increasing water content of the loaf. Thus a rise in the extraction-rate from 80% to 90% is accompanied by a fall of 6% in the available calories supplied by a loaf of given weight made from it. Happily, in times other than those of acute food stringency, the main consideration is not that of securing the maximum yield of calories, to which the present study of Dr. Booth and Dr. Moran is essentially dedicated.

FORM AND FUNCTION

IN the third of a series of open lectures on subjects of wide scientific interest arranged by the Edinburgh Postgraduate Board for Medicine, Dr. Robert Walmsley on May 28 discussed the biological correlation between human form and function. A simple anatomical example of this correlation is the factors concerned in keeping the patella in place during extension of the knee joint. In considering the variations that occur in total body form Dr. Walmsley outlined the many classifications which have attempted to correlate body groups with definite functional and clinical entities. Thus Hippocrates recognised two basic types of body form which he called "habitus apoplecticus" and "habitus phthisicus." Halle in 1797 introduced his digestive, muscular, and cerebral groups, and new names were added by successive workers in this field, many of which, however, were based on visual impressions according to whether the subject was fat, muscular, or thin. The relationship between physical traits and susceptibility to disease was studied by Draper in New York who tried to establish disease types by building outwards from the clinical evidence of certain diseases to the physical make-up of those who suffered from them; thus he came to recognise gall-bladder and gastric-ulcer types. Other workers, notably Kretschmer, tried to correlate body build with non-organic mental disease.

It soon became clear that the classification of body build according to anthropological measurements could provide only a series of mathematical indices which conveyed little to physicians who wanted a satisfactory description of the body types they knew from clinical experience. The work of Sheldon, of Harvard, from 1930 onwards has provided a scientific method of classifying 100% of healthy mankind. Sheldon introduced a numerical scale in which the make-up of the whole body could be expressed by three numerals, each of which represented the degree of development from the three primary germ layers—endoderm, mesoderm, and ectoderm. The maximal numeral assigned to any one germ layer derivative was chosen as 7 and the minimum as 1. In this way it is possible to define three main groups of body builds or somatotypes, and all the many intermediate types can be expressed by this simple notation. Thus, somatotype 711 is the extreme endomorph with all the physical and mental characteristics that go with an overwhelming predominance of the alimentary viscera; these are the Mr. Pickwicks of everyday life. Somatotype 171 is the extreme mesomorph, with emphasis on muscular and bony development, and 117 represents the extreme ectomorph in whom the central nervous system predominates in a body which has poorly developed digestive and skeletal apparatus. Sheldon has so far isolated and described some 76 somatotypes out of 343 theoretical possibilities, and has postulated three temperamental components, viscerotonia, somatonia, and cerebrotonia, which correspond to the three main body types. The relationship between the different somatotypes and carefully assessed and established bodily disease provides a fruitful field for research. But if this study is to attain the dignity of a science full consideration must be given to every environmental factor, both physical and socio-economic.

---

[1] Macrae, T. F., Hutchinson, J. C. D., Irwin, J. O., Bacon, J. S. D., McDougall, E. I. *J. Hyg., Camb.* 1942, **42**, 423. McCance, R. A., Widdowson, E. M., Moran, T., Pringle, W. J. S., Macrae, T. F. *Biochem. J.* 1945, **39**, 213.

AVOIDABLE CANCER

Though cancer of the scrotum contributes less than 8% of the deaths caused annually by cancer of the skin, there were 1335 scrotal cancers out of 3333 notified cases of occupational skin cancer between 1920 and 1943. More than half of these (793) occurred among cotton mule spinners who come into contact with mineral lubricating-oil. The remainder of the 3333 cases were distributed over a wide variety of trades falling naturally into two main groups, in one of which there is contact with pitch, tar, and bitumen and in the other with shale and mineral oils. That this is not the whole story of carcinogenic agents and occupation is indicated by Henry's prodigious investigations [1] of the occupational histories of people whose deaths were notified to the Registrar-General as caused by cancer of the scrotum. He gives his results in a table which lists 101 separate occupations, together with proved or suspected carcinogens such as mineral oil, tar, pitch, soot, creosote, arsenic, and "heat with radiations." The estimated incidence in the populations at risk shows that scrotal cancer is highest in chimney sweeps; then come patent fuel workers, cotton mule spinners, textile spinners, and tar distillery workers, in that order. Surprising information is obtained when a case is fully investigated. "It was naturally interesting," writes Henry, "to expose the parish clerk as a gasworks stoker; the mineral-water manufacturer, the traveller in vinegar, and the musician as cotton mule spinners . . . the grocer as a patent fuel worker . . . the general labourer as a chimney sweep; these discoveries giving the answer to the problem." But he experienced even greater interest and a healthy feeling of frustration when he found that the fish porter was a conjuror, the cotton warehouseman a pugilist, and a painter an ex-acrobat—revelations which threw no light on the problem. It was not until the inquiry was under way that he began to appreciate fully the possibilities of medicinal treatment (e.g., by arsenic) as a cause of cancer, and he hopes that others will follow up this line of investigation.

Henry admits that the best method of preventing scrotal cancer is to use a non-carcinogenic material in industry instead of a carcinogenic one, but unfortunately he emphasises the practical difficulties of choosing the correct oil and of obtaining enough of it. Presumably there are shipping and other difficulties at present, but we wish he had thrown official caution to the wind and come down heavily for the prohibition of mineral oil as a lubricant for cotton mule spinning-machines. These machines used to be lubricated with sperm and neatsfoot oils, and it was only after the introduction of mineral oils that cases of mule-spinners' cancer began to appear. It is hard to believe that such a simple preventive measure as the use of non-carcinogenic oils could not be adopted. As far as is known vegetable oils are not carcinogenic, and in normal times they are not scarce, though possibly they are more costly than mineral oils. There is greater difficulty in controlling the dusts of tar and pitch, and for many purposes substitutes cannot be found.

It is odd that the products of coal and petrol which have lain under the earth for centuries should have carcinogenic properties whereas products of living plants have not. Henry looks back to the time of Pott, and the discovery of chimney sweeps' cancer; and he wishes for a magic carpet to take us back 200 years to find out what was the incidence of scrotal cancer in those days, and forward to the time when the deposits of coal and petrol have been consumed, to see whether there will still be scrotal cancers. He ends with an apt quotation from George Moore: "In two hundred years there will be fields where today there are cinder heaps. . . . But coal and petrol are not endless even in America; and as soon as both are among the gone, the world will start on a new race again."

MILK INDUSTRIES COMPARED

The mission that has been studying milk-production in North America [1] says that there, as here, the milk industry is largely based on the family farm carrying 15–30 milking cows; and economists hold that larger units are not inherently more efficient. By trade-union standards the family is grossly overworked, and the hired farm-worker receives only about half the reward of the milk roundsman, although his work is certainly more exacting and more skilled. In general, the pastures are inferior to those in Britain, but maize-corn and lucerne are important fodder-crops which might have more attention in this country. In most of the Eastern States nearly all the farms have electrical equipment, and the mission thinks that a supply of electricity would provide the greatest single improvement on our dairy-farms. (On many of them, however, a proper water-supply is needed more.) Steam sterilisation of utensils and milking machines is less common than in Great Britain: chlorine disinfectants and lye solution (0·5% NaOH) are used, and special attention is paid to cooling of milk which is done by standing churns in cooling tanks. In addition, all milk is pasteurised when it reaches the depots. The health authorities are finally responsible for hygienic standards, but much of the milk-testing is done by the large dairy firms. Milking-parlours are still in the experimental stage. The price of milk is related to its butter-fat content and "Golden Guernsey milk" brings a higher return to the producer. The mission strongly recommends that a similar scheme, or one related to the total solids, should be introduced in Great Britain; but otherwise they believe that the milk-contract system in this country is much superior to those in America. In a land of domestic refrigerators milk may be delivered only once every two days, and much of it is bought from shops in cartons.

The report shows that production of milk is probably more efficient than it is here. The average annual yield of cows is about 100 gallons (approximately 15%) higher than in Britain and replacement costs are lower. The higher yield has been largely achieved by using Holstein Friesian cattle, which give the best return even though payment is made on a butter-fat basis, and by a more consistent policy of breeding for high milk-production. Long-term experiments at Beltsville are indicating that the use of proven sires (known to throw heifers giving high yields) is as effective as intricate line-breeding programmes for raising milk-yields, and artificial insemination enables the best use to be made of proven bulls. The mission advocates further breeding research in this country and more use of artificial insemination in order to develop single-purpose dairy animals. In his classical work on breeding dairy cattle, however, Prentice [2] emphasised that the beef qualities of dairy cows may, under certain conditions, be an important factor in the economics of dairying, and the Shorthorn is still widely used in the less intensive dairying districts

---

1. Henry, S. A. Cancer of the Scrotum in Relation to Occupation. London: Oxford University Press. Pp. 112. 15s.

1. *Agriculture Overseas.* Report no. 1: Milk in North America. H.M. Stationery Office. 1946. Pp. 64. *1s. 3d.*
2. Prentice, E. P. American Dairy Cattle. New York and London 1942. Pp. 453.

both of the United States and Britain. Of the dairy breeds, the Friesian provides by far the best carcass, which gives it an additional advantage over the other types.

Beyond noting the very low incidence of tuberculosis in North America and advocating a more vigorous policy of control, including area eradication, in Britain, the mission produces little evidence to show why replacement costs are lower than in this country. The control of contagious abortion is probably more effective across the Atlantic, but there is no panel scheme comparable to that in Britain. One might add that foot-and-mouth disease does not exist; and Texas fever, a protozoan infection which at one time threatened to destroy the cattle industry, has been controlled. It appears from the report that milk-production in North America is rather more efficient than in Great Britain because of a more consistent breeding policy, helped by long-term research, and smaller losses from disease, partly due to geographical isolation, but also again to research and disease-control. It is noteworthy that ever since its formation half a century ago the Bureau of Animal Industry in the U.S.A. has been fortunate in choosing a series of particularly able veterinarians to direct its work.

WORK FOR THE TUBERCULOUS

Reablement is treatment of the patient, as opposed to treatment of the disease. Dr. C. K. Cullen[1] accepts the view that it should start as soon as the patient comes under care, and points out that he not only must be occupied and diverted but also should know what it is all about. After the early stage of complete rest—and the need for rest must be explained to him—he should be given some diversional handicraft; but "it must be made clear to him that this is just a temporary hobby and that we are not expecting him to earn his living on discharge by selling fancy mats or basket work." When he improves and reaches the workshops he should be encouraged to have confidence combined with caution, and the psychological effects of a setback must be counteracted by explanation and fresh encouragement. All this may seem mere common sense, but Dr. Cullen finds it disturbing that many sanatoria are still a long way behind in its application, while a few "are still places for human vegetation."

When the patient is fit to leave the sanatorium it has to be decided whether he can return to work, and if so what work; and often what would be best for him must be over-ruled by what necessity forces on him. This is the main problem for the tuberculous, and we have at last begun to tackle it on a national basis; but economic necessity remains the driving force under which 40–50% of patients go back to their old jobs. It is demoralising to lead less than a normal life, and Dr. Cullen believes that if patients are at all fit for it they should re-enter employment as soon as possible, provided they go to bed early in the first few months. Often, however, the work they return to is unsuitable, and about a third of those who return to their old jobs break down again. He estimates that of patients discharged from sanatoria, about a third are quiescent and can go back to normal work, about a fifth are unfit for any kind of work, and the rest need sheltered work under supervision. The progress of this last group depends on their conditions of life and work; they provide most of the "breakdowns" under present conditions. The old idea that tuberculous people need open-air work has been given up, for most open-air jobs are heavy, and the English climate is treacherous. They need indoor jobs in a well-ventilated, dustless atmosphere, without strain, or long journeys to and fro. Colonies and settlements, like Papworth, may be highly successful, but some have failed through inability to find enough capital at the outset. In any case the family has to uproot itself from its old connexions when a patient joins a colony. Ex-patients can often be employed as sanatorium staff, but this too offers difficulties for the man with a family. Dr. Cullen believes the sheltered workshop, offering employment to the man living at home, is the most useful agency for reablement. The experience of the Altro workshop in New York shows what a high survival-rate can be achieved among the tuberculous if they are started off under favourable working conditions; on following cases for ten years it was found that 87% of the minimal cases, 86% of the moderately advanced, and 63% of the far advanced were still alive; for those over 55 the mortality-rate was the same as for the general population.

Many of the "good chronics" in whom the sputum is occasionally or regularly positive could take jobs in industry if proper hygienic precautions in canteen and workroom were enforced—and these should be general whether tuberculous patients are employed or not. Municipal authorities especially have many posts which the tuberculous could fill. For more advanced chronic cases he thinks we need sheltered workshops, either as sections of factories or as separate ventures. Many patients will "graduate" (as they do from the Altro workshops) from these sheltered conditions to the open labour market. It may also be possible to establish day sanatoria and night sanatoria comparable to those of the Soviet Union—or at least to provide special rest rooms in sheltered workshops and factories. He notes the special needs of the housewife who at present gets no financial benefit except 10*s*. a week towards household help if she is unable to work. No house can be kept clean for that sum in these days. Finally, he is anxious to see a great improvement in the environment to which the patient must return. "How often do we see a patient steadily improve and then go back to conditions of housing, food, restricted recreation and unsuitable work which knock him down again . . . ?"

NUTRITION IN THE WEST INDIES

The call for planned intensive cultivation is nowhere greater than in the British West Indies, which, with its dense and still-growing population, relies on imports for nearly all its wheat and rice and still finds it hard to support its inhabitants. Barbados, for example, with a density of 1226 persons to the square mile, has a birth-rate of 29·13 and a death-rate of 16·42; Trinidad has a birth-rate of 39·95 and a death-rate of 15·55, and for Jamaica the figures are 31·15 and 14·0. Whereas in an island like Malta the problem has been partly solved by emigration, no such solution offers itself to West Indians. Dr. Platt's study of nutrition in the area[1] is therefore all the more important. Among the disorders he observed in hospital populations were œdema, pellagra, extreme anæmia, keratomalacia, and riboflavine deficiency. Employers complained that labourers were inefficient and worked no harder than they must to earn a bare subsistence. But it has been found, at least in Trinidad, that the length of the working day is limited by fatigue, and Dr. Platt attributes this to undernourishment. He estimates that the average calorie-intake is about 2400–2500, with deficiency in the B_2 vitamins (especially riboflavine), calcium, and protein. His first recommendation is therefore the adoption of an 80%-extraction flour "ennobled" by the addition of up to 3% food yeast, a calcium salt, and possibly also iron. Importation of skimmed milk should be extended, particularly among priority groups such as school-children, and increased production of pulses and groundnuts is proposed as providing valuable sources of B_1 vitamins and of protein (approximately 100 g. per lb.) and containing useful amounts of calcium and iron. Green leafy vegetables should be more widely consumed since they contain essential amino-acids, vitamin-A precursors, and some of the B vitamins.

---

[1] Back to Life and Work: Rehabilitation of the Tuberculous. Published by the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1. Pp. 16. 2*d*.

[1] Nutrition in the British West Indies. B. S. Platt, C.M.G. M.SC., PH.D., M.B. (Human Nutrition Research Unit, Medical Research Council.) H.M. Stationery Office. Pp. 38. 9*d*

Since some diets are far below the average, Dr. Platt advises that more equal distribution of food should be promoted by price control and collective feeding. The immediate objective suggested in his report is a diet yielding 2500 calories, and containing 60 g. protein; but he points out that even on such a diet full physiological efficiency will not be attained. A long-term policy will include the growth of improved varieties of crops, the proper use of fertilisers, and the concentration of cropping in the best growing season. (Strangely enough, no mention is made of the possibilities of fish and other sea foods as sources of the protein that the islanders need.) According to a statement by the Secretary of State for the Colonies on July 3, action on the report may shortly be expected. Efforts are being made to obtain "ennobled" flour from Canada; trials of feeding children with skimmed milk and food yeast are proceeding; and a nutrition working party seems likely to be formed.

THE CHILD WITHOUT A HOME

The child deprived of a normal home life finds his worst trouble in the fact that he belongs to nobody. Lady Allen of Hurtwood, in a memorandum on the evidence she gave last year to the Curtis Committee on the care of children, suggests that all children who lose their legal guardians should, either temporarily or throughout childhood, become wards of the State, by order of a court, and that the State should be responsible for their proper care and upbringing. Every such ward should have a personal trustee to look after his interests and administer his property if he has any. Trustees would have access to their wards whenever they liked, and would be free to select, with the help of the observation centres which have been foreshadowed, the kind of care most suited to the needs of the child, and to transfer him if it seemed that he would benefit by a change. Each trustee would be responsible for a number of children—she suggests 150 as a suitable number. She shares the view of the Curtis Committee that the child, before being placed, should be under skilled observation in one of the centres mentioned, so that the chances of his getting into an unsuitable environment will be much reduced. The great thing, as she points out, is to get every child absorbed into the full life of the community; and the best method, of course, is by adoption. A good and reliable foster-home comes next, but has the drawback that the child cannot be certain his place in it will be permanent. The small home with 8–10 children of mixed ages, with a married couple in charge, can be very successful, and Lady Allen suggests a promising variant of this in one of her footnotes: a married couple, presumably without children of their own, could be invited to act as foster-parents to a group of children, being suitably paid for doing so; each year they would take on a baby, so that in time they would have a family of 6–8 children of ages similar to those found in an ordinary family, and would bring them up until they were settled in life. This sounds a thoroughly good plan, likely to give the children the security of ordinary home life, and to be a pleasure to the foster-parents if they are of the natural parental type.

She objects cogently to grouped cottage homes that they do not make the children part of the ordinary community: the "mothers" are often childless widows or spinsters, the sexes are segregated, some 15–25 children occupy one cottage, often grouped according to age, and often they attend school within the community. It is hard, as she says, to imagine anything less like a family group. Some children would benefit by education in boarding-schools of good type, provided they could be given a free family life during the holidays. To achieve this, each child, she thinks, might have a guardian who would act as a personal friend, welcome him into his home for the holidays, and help to launch him into the world. These part-time guardians would come from all levels of society, and would be selected by the child's trustee in consultation with the school. They might be helped with maintenance grants during the school holidays. The child would thus have the sense of "belonging" to someone outside school.

Lady Allen suggests that the entire maintenance cost of the child who becomes a ward of the State should be borne by the taxpayer, and that only one Government department—preferably the Ministry of Education—should have charge of him, though certain duties might be delegated to other departments or to local authorities. Her well-considered proposals would do much to give the child who loses his home the place in the community which counts so much in normal development, and of which he is at present so often deprived.

DENTAL BENEFITS OF WAR

It is an alluring and consolatory notion that war reduces the incidence of dental caries by imposing a diet comparable with that on which primitive man developed perfect teeth. But is it correct and as simple as all that? At a meeting of the Norwegian Medical Society, reported in *Nordisk Medisin* for June 7, Dr. A. Collett pointed out that the incidence of dental caries in the larger Norwegian towns had begun to fall shortly before the late war, during which this fall was greatly enhanced. Early in 1938 the Norwegian Society for the Prevention of Dental Diseases started an intensive propaganda against denatured carbohydrates and on behalf of other dietetic reforms; and it was in 1938 that the decline in dental caries began. Dr. Collett linked the reduction in dental caries during the war with the monotonous diet, low in calories and in fruit and vegetables. In the same period toothbrushes and dental pastes became scarce, and the growth and weight-increase of Oslo school-children showed a well-marked decline. The consumption of sugar fell from 87 to 30 g. per day per head, and sweets were unobtainable. In Dr. Collett's opinion the relationship of dental caries to food is quite plain, and he quotes Göthe with approbation as saying: "It irritates people that truth is so simple." At the same meeting Dr. T. Gythfeldt, senior school dentist in Oslo, declined to regard the problem of dental caries as practically solved. He pointed out that between 1936 and 1940 there was a considerable rise in the consumption of sugar and chocolate, and yet the incidence of dental caries fell sharply in the same period. Again, though the incidence of caries has also declined in Sweden, that country had plenty of chocolate throughout the war, and its consumption of sugar per head was higher than that of Norway before the war. In Norway since 1940 there was a remarkable decrease not only in the consumption of sugar and chocolate but also in that of meat, vegetables, fruit, cheese, and butter. On the other hand, the consumption of fish and cod-liver oil rose, and a greater use was made of calcium and vitamin preparations. "Before the war," said Dr. Gythfeldt, "there was a steady rise in the use of milk, milk products, fruit, vegetables, and cod-liver oil. During the war we have advocated calcium and vitamin preparations. Children's teeth are better not because of the war but in spite of the war." The explanation may yet be forthcoming, for the Norwegian Society for the Prevention of Dental Diseases has offered a prize for the best investigation into the causes of the decline of dental caries during the war.

could they judge the merit of the Minister's objec- to the clause unless he disclosed his powers and the itions which might govern them ?

committee divided, and the clause was negatived 8 votes to 107.

. H. LINSTEAD moved a similar clause providing for maintenance of services provided by voluntary isations and asked the Minister whether he was ied that he had power—in whatever dark recesses *ght reside—to help these organisations* if they were ifficulties. Mr. BEVAN promised that assistance d be forthcoming, and the clause was negatived.

DELEGATION OF COUNTY COUNCIL'S POWERS

r. D. L. LIPSON moved a new clause providing for the gation by a county council to boroughs within the ity of the powers which it holds under part III of Bill as a local health authority dealing with the care mothers and young children, the employment of wives, health visiting, home nursing, vaccination immunisation, ambulance services, the prevention of ss, care and aftercare, and domestic help. The ough councils had exercised these powers well in the and all these services were personal human services ch were best administered locally, yet to most people county administration was remote. Again, many ired immediate attention, and the smaller authority once a month and the county council only four times ear. What was really involved was the future of l government. In the past it had been a successful hine because it spread responsibility among more more citizens. We were endangering this demo- ic form of government if we took away the powers of smaller authorities. Many of the larger authorities ld welcome the opportunity of delegating these vers because they felt unable to give the necessary e and attention. If the Minister persisted it would n that the administration of these services would rest ely in the hands of officials; and local-government cers, though they might be good servants, were bad sters.

Ir. BEVAN protested that he had done nothing in this l with the intention of undermining the structure of al government, but had kept only one consideration mind—the welfare of the patients and not the interests ocal government or anyone else. If the new clause s accepted it would not only fundamentally change the l, it would wreck it. In every measure it was possible say there were borderline cases, and it was true that re were local authorities that had reached a stage en they ought to be promoted, but that was a matter the Boundary Commission. If after bringing in this eme the Minister was asked to arbitrate between the pective claims of different authorities he would get o an administrative morass at the very time when the ain task of launching the scheme was in hand. Mr. van also pointed out that the school health service s not yet part of the National Health Service but the Bill the local health authority was coterminous th the local education authority. Provision was made r counties and county boroughs to have subcommittees which the local authorities in the area would be presented. He denied that we were undermining local vernment. Its functions were changing and must be stated from time to time in terms of the needs of e situation and of new principles of administration. eorganisation of local government which adapted it to the eds of the situation vitalised it. What devitalised it as to maintain a structure wholly out of accord with the eeds of the situation.

Mr. E. H. KEELING thought that it would create less haos to leave these powers in the hands of the borough ouncils for the time being than to transfer them at once the county councils. Mr. ANTHONY GREENWOOD rged that maternity and child welfare were not only atters of chromium, white enamel, vitamins, and od-liver oil. The people who administered the service hould know the local conditions in which the mother nd child lived. Mr. J. A. SPARKS pointed out that the linister was allowing the county councils to hand over owers to voluntary organisations and he did not see why fficient non-county boroughs should not be treated imilarly. Mr. H. WILLINK thought it would have been iser if a population figure—such as 70,000—had been taken as appropriate for an excepted district. He felt that the Minister was falling into the state of rigidity which he claimed to avoid.

Mr. KEY thought that, when people talked of taking out of the county area non-county boroughs and then large urban districts, they forgot that this would leave the county authority with a remnant area without the necessary centres of operation for the services which must be provided.

The clause was negatived by 218 votes to 115.

THE GENERAL PRACTITIONER OUTSIDE THE SERVICE

Mr. REID moved the following new clause:

> The Minister may allow any general medical practitioner to make arrangements for the examination and treatment of his patients whether they be private patients or patients in respect of whom he has undertaken to provide personal medical services under this Act at any hospital within the region of the regional hospital board for the area in which he is practising in which accommodation is set aside for such examination and treatment by general medical practitioners either free of charge or on payment in part or in full of such charges as may be prescribed.

Mr. Reid pointed out that the Minister had on several occasions stated that anyone was entitled to take any part of the comprehensive medical service while rejecting other parts. Thus a patient could take the free State hospital service, even if he did not take the services of a medical practitioner in the scheme. In practice, however, there was a curious anomaly, which this new clause was designed to obviate. One could go to a State hospital in three ways—to the free hospital service, to the small ward in which one paid a part of the cost of one's reception, or to the pay block, where one paid the whole cost of one's reception. In every case one ought to have a free choice of doctor and specialist, and the specialist position was, Mr. Reid thought, reasonably well met, because the Bill did make provision for specialists having beds in pay blocks so that patients could employ specialists outside the scheme while taking the hospital service.

But, when we came to the doctor, it was rather different. The Minister had admitted that it was proper for the doctor always to be allowed to follow the patient into the hospital. Accordingly, if the doctor was in the State medical service, he was entitled to go into the hospital and see his patient, or, if it was an ailment which did not require specialist treatment, to treat his patient in the hospital. A doctor who was part-time in the State service could follow not only the patient who did not pay into the hospital but also his paying patient. But what of a doctor who was not in the State service at all? What was the difference between a paying patient who employed a doctor who was part-time in the State service and a paying patient who employed a doctor not in the State service at all? From the patient's point of view there was no difference at all, and he should have some right to the services of his doctor, whom he paid, in hospital, irrespective of whether the doctor had some other non-paying patients or not. That was the basis of this new clause. Sir HENRY MORRIS-JONES, in supporting the clause, said that though, he thought, the majority of doctors would join the scheme, some elderly semi-retired practitioners might wish to continue to be paid by private patients. There were many hospitals where no specialists were available, and the general practitioners of the area had been accustomed to have access to them. Surely the Minister did not intend to deprive one or two doctors in an area of the right of *access to hospitals where they had been treating* patients for years.

Mr. KEY pointed out that an amendment had been made to clause 5 extending to general practitioners the power given to specialists of attending their private patients in a hospital, but on the understanding that, like the specialist, the general practitioner was in the national service. The Government were not prepared to allow a doctor to stand entirely outside the national service yet make available to him all the facilities provided in the hospital, so that he could build up a big private practice outside the national service. Mr. Key further assured Mr. Linstead that every general practitioner serving in an area would have the opportunity of following his patients into the general-practitioner hospital, and that if he did so he would be regarded as being on the staff of the hospital.

The clause was negatived.

REGIONAL BOARD FOR WALES

Mr. E. ROBERTS moved a new clause setting up a regional board for Wales, but Mr. BEVAN asked that it should not be pressed for he was unwilling to write into the Bill the area of any particular board. Members, however, need not fear that the solution for Wales would depart very far from their own desires. Although Wales had a sentimental and traditional unity, God had divided it geographically in an unfortunate fashion though with considerable beauty. The result was that the medical requirements for Mid Wales were provided from one area, for North Wales from another, and for South Wales from another. But he did not want to deny to the Welsh people the advantages of being associated with universities, and a solution would have to be worked out which paid proper regard to the peculiarities of the area.

The clause was negatived.

CENTRAL COUNCIL

Mr. KEY moved amendments to clause 2 extending the range of matters on which the Central Health Services Council and the standing advisory committees could advise the Minister to embrace the services provided by local health authorities, including matters not enumerated in the Bill such as child-life protection and mental deficiency. A further amendment was passed ensuring that the council should have the opportunity of reviewing the advice given to the Minister by the advisory committees.

ENDOWMENTS AGAIN

Mr. REID moved an amendment to clause 7 providing that endowments should go not into a general pool but should be kept in the hands of the hospital management committee in whom the management of the endowment hospital is invested. No-one knew how much the pooled endowments would amount to, but Mr. Reid would be surprised if there were £30 million, apart from the teaching hospitals, and that amount, at the rates of interest now prevailing, would give considerably less than £1 million a year as expendable money under the fund. Spread out over nearly half a million beds that would not be much of a shock-absorber, and he feared that by distributing the money so widely the Minister was taking away from its value. Would it not be better to leave it where it was and enable these hospital management committees to do things outside the sealed pattern scheme of the Minister. If that way of using the funds proved a good one there would be a lead to the Ministry to go and do likewise in the other hospitals. He did not want to see one hospital for all time better off than another, but if there was to be pocket-money he wanted to see it in sufficiently large packets to enable something of use to be done with it.

Mr. BEVAN said that the endowments of teaching hospitals were often earmarked for special purposes, but money left to a general hospital was for the purpose of that hospital, and as the Government were providing for the hospital in the future they were entitled to take that money and use it for general purposes. Even Mr. Reid did not ask that an endowment should be left with a particular small local hospital, and Mr. Bevan could not see how its diversion to a general management committee rather than a national pool was a smaller violation of the intention. He could not understand this geographical definition of qualitative violations. To leave the money in the area covered by a particular management committee because if it were spread over the country it would be so thin would have the effect of leaving some management committees with no endowments at all. Yet why should the fact that an area had received benefits from well-to-do people be perpetuated at the expense of poorer areas?

Mr. STRAUSS regarded this clause as one of the two chief blemishes on the Bill. In contrast with the proviso made in the case of the teaching hospitals, these endowments would pass to the Minister free of any restrictions, yet he did not see why the Minister should be less bound. Mr. BEVAN interrupted to ask if Mr. Strauss would be content if he left a benefaction with a particular hospital but took into account that money when determining what extra sums were needed by the hospital. Mr. WILLINK pointed out that as the Bill was drafted money given to a hospital before the appointed day would be spread over all England and Wales, but if the donor waited till the appointed day he could give it to the hospital management committee in his district. As the measure stood all charitable people would believe that whenever there was a Socialist majority the House would take the money away from the purpose for which they wished it to be used and spread it according to the wishes of the Executive.

The amendment was negatived by 240 votes to 107.

Mr. KEY moved amendments extending to the hospital management committees the powers given to the regional boards under this clause.

Commander T. D. GALBRAITH moved an amendment, excluding gratuitous covenants from endowments, which was negatived by 255 votes to 110.

FUNCTIONS OF HOSPITAL MANAGEMENT COMMITTEES

Mr. WILLINK moved an amendment to clause 12 dealing with the functions of these committees, which he admitted the Minister was not likely to accept as it stood. The proposal Mr. Willink considered especially important was that all hospital officers, except specialists, should be in contract with the management committees and not the regional boards, and he urged the Minister to consider inserting in the Bill powers under which there might be parts of the service, notably the nursing service and the domestic staff, in which people could be servants of their local hospital and not of the regional boards.

Mr. BEVAN sympathised with the intentions of the amendment but believed that they could be met by leaving the structure of the Bill unchanged. He was unwilling to insert the actual functions of the management committee in the Bill because that would be fixed by regulation, which was a more flexible method. He agreed that in the recruitment of nursing and domestic staff it was desirable to maintain a close link with particular hospitals and that the regional boards should be in the background. But he thought that this would be achieved, for apart from the senior officers the rest of the staff would in fact be appointed by the management committees. Their formal contracts with the regional board would, however, provide reasonable opportunities for promotion.

The amendment was withdrawn.

THE METROPOLITAN BOROUGHS

Mr. WILLINK moved a long amendment to clause 19 providing that the London County Council should delegate its functions under part III of the Bill to the metropolitan boroughs on the lines agreed between the L.C.C. and the standing joint committee of the boroughs. The Minister had made the excuse that these proposals would put him in a difficulty with the non-county boroughs, but surely it was obvious that the allocation of functions in London was a special problem. Mr. BEVAN said his strongest reply was that the problem of London had to be considered in the light of a shifting population. We would have to redistribute a proportion of this highly congested population, and new relations would have to be established whatever authority might preside over the wider London area. He was unwilling to change one of the main provisions of the Bill to deal with a transitory situation. Further, in London he had followed the same principles which were applied to the rest of the country and he would find it difficult to make an exception, but he hoped it would be possible in London to secure a degree of decentralisation by means of a scheme, worked out in coöperation with the L.C.C. and the metropolitan boroughs, which would give local people an interest in the administration of the service. But among the boroughs themselves there were many artificial divisions, and they were not necessarily the units that ought to provide some services. It might be found that area committees on which a number of boroughs were represented would be a better solution.

Mr. D. WEITZMAN thought that London was in a special position and pointed out that the L.C.C. was the only county council that had not been responsible for welfare work, which had been carried out by the metropolitan boroughs. Thus the L.C.C. was an entirely new body as a health authority.

Mr. C. W. GIBSON intervened to say that not all London boroughs supported the proposals.

The amendment was turned down by 224 votes to 99.

UNORTHODOX HEALERS

Mr. G. HOUSE moved an amendment to clause 33 providing that nature-cure practitioners who reached a required standard of training should be recognised under the Bill and that patients should have the unfettered right to attend the practitioner of their choice. The first proposal, he said, was based not solely on the merits of nature-cure practitioners but conversely on the fact that medical practice, in so far as it is based on the application of medicine, drugs, and vaccines, was undesirable. The Bill enforced a weekly contribution of 4*s.* 11*d.*, a comparatively heavy sum for a working-class man, and the poor person could only have real freedom of choice if the services of a nature-cure practitioner could be paid for from the National Health Service fund. Nature-cure practitioners, Mr. House asserted, would be willing to offer their services to the community on the same capitation basis as the medical profession. He admitted there was a difficulty about qualification. Some schools for nature-cure practitioners laid down for their members a minimum of four years' training, and all over the country there was an endeavour to get their standard of qualification on an acceptable basis. But he agreed that we could not dip into the national funds for practitioners whose qualifications could not be proved. He thought the Minister should give these people some help. To say that they could only be recognised provided they took a medical degree was a cowardly evasion. Was it right that people who were opposed to chemicals and drugs should be asked to take a medical degree? Mr. R. EWART, who seconded the amendment, pointed out that under the new Bill people who objected to submitting themselves to orthodox treatment would be denied the right of benefit given them by the National Health Insurance Act of 1936.

Mr. BEVAN said that the heterodoxy of yesterday often became the orthodoxy of today, and that the medical profession now practised many forms of therapy which it formerly rejected. There was nothing wrong with that and it was not being interfered with. But he did not intend to commit the indiscretion of judging the relative merits of one form of therapy as against another. The House was discussing an amendment which would place on the executive council of each area the obligation of providing whatever kind of medical attention any citizen might want. That was impossible, yet that would be the result if the language of the amendment were adopted. If one were to begin to select, from the forms of therapy lying outside the Medical Acts, forms which we would be prepared to give, where should the frontier be fixed? He had met representatives of these unorthodox bodies. Many were people of dedicated zeal who had done good to many; but the evil they had done was not on record, and that was the whole difficulty. Unfortunately the evil done by doctors was not on record either. If the House placed upon the Minister the responsibility of providing a service they must accept the obligation of defining that service, and so far Parliament had decided that the service was to be the medical service within the Medical Acts. Once a doctor was qualified no-one interfered with the kind of treatment he gave, and no-one would interfere with what a nature-cure practitioner did after he had acquired a medical qualification. But Mr. Bevan thought it appalling that the State should be called upon to provide a form of treatment which the proposer of the amendment himself could not define because almost all the evidence for it was subjective and based on testimony. If it were capable of systemisation, codification, or verification it would become an accepted form of medical therapy. He was not suggesting that medicine was 100% scientific, but it was scientifically ascertainable. Most of the weekly contribution of 4*s.* 11*d.* was for pensions, invalid allowances, and so forth, and less than 8*d.* was for the health services, which were mainly free. If people wished to avail themselves of a form of treatment not provided by the National Health Service they would have to pay for it. It was true that under the National Health Insurance Acts there was some provision rarely exercised for the subvention of people who wished to have some other form of treatment, but it was difficult to administer and if it were extended would become impossible.

Sir HENRY MORRIS-JONES pointed out that unorthodox treatment which delayed orthodox treatment had resulted in great loss of life. Sir ERNEST GRAHAM-LITTLE declared that schools of naturopathy in this country were few and ill equipped and their examinations puerile. Osteopathic schools were entirely confined to America. Half-way through the House of Lords' inquiry into osteopathy its champions were overwhelmed by the evidence and threw in their hand. He thought there should be a basic examination to ensure that practitioners of irregular practice should know something of the action of drugs even if they did not deal with them. At present they were rightly cut off from consultation with qualified practitioners and thus lost the immense impetus of meeting their fellow workers. For these reasons Sir Ernest thought it was premature to recognise any branch of irregular practice. The amendment was negatived.

CERTIFICATION

Mr. R. H. TURTON moved an amendment to provide uniformity of style, legibility, and cost of medical certificates. Why should the Minister not have power to make regulations for all medical certificates and not only those required under the Bill? Why could not all medical certificates be free? Mr. BEVAN said that at present the issue of certificates, when charged, was limited to certificates connected with insurance work. The language of the Bill extended that a good deal, and further certificates would be issued for the purpose of any enactment under which certificates were required. But to suggest that anyone should receive a certificate from a doctor whenever he wanted it and whatever he wanted it for would be going too far. The amendment was withdrawn.

DISTRIBUTION OF PRACTITIONERS

Mr. REID wanted clause 34 amended so as to allow any doctor to go on any list in any part of the country provided he is not personally objectionable. In the second reading debate the House had been told that the clause in its present form was essential to achieve a proper distribution of doctors, but upstairs in committee it appeared that all these objectionable clauses were based on the ideological belief that there is something intrinsically evil about the purchase and sale of goodwill. The Minister had not shown that control of the movement of doctors was necessary for practical reasons. And how would an "adequate" number of doctors in an area be interpreted? Any practitioner who did not choose to go to one of the very few grossly under-doctored areas might be told "No, those are relatively adequate, and you cannot go there without permission." Any such strict limitation was wholly uncalled for. When over 90% of the population went on doctors' lists, areas at present not very attractive would be among the most attractive financially. In a certain number of difficult areas—e.g., with scattered populations—an additional salary might be offered.

> "If there is no part of the country to which a doctor in the public service is to be allowed to go without getting the permission of some committee, then we are miles away from any question of maldistribution, because maldistribution would lead to setting aside over-doctored areas which cannot be entered without permission, and under-doctored areas where everyone is welcome."

In filling vacancies it now appeared that three partners could no longer say "we want John Smith as the fourth": instead they must take a man selected by the committee of their medical colleagues in the district. "Is it necessary that this very elaborate system of control should be put upon the medical profession?" Nobody had yet produced any fact that would justify it. The utmost possible freedom should be given to doctors to come together in partnerships.

Mr. BEVAN said there were two first principles—that the sale of practices is objectionable and that equitable distribution is required in the general-practitioner service. Whichever of these principles was regarded as primary, the effect was the same: the present method of obtaining a successor was abolished and new machinery was required for distribution of practitioners. The Government suggested that the selection of doctors to fill a vacancy should be by the local executive council, because —especially in group practices—a new doctor ought to be a person agreeable to his future colleagues. At the centre the Medical Practices Committee would have a complete picture of the situation throughout the country:

> "Any doctor wishing to enter into contract will be able to see where any vacancy exists at any moment. Therefore, he would be able to decide to what particular place he wished to go and to which executive council he wished to make application. . . . The local executive would consider the application, and the local medical committee would make representations."

The partner, though not the final determinator, would obviously influence the appointment. To have the individual doctor appointed by the Medical Practices Committee would indeed be bureaucratic centralisation, but validation by the committee made it possible to appeal against any irregularity—e.g., undue influence. Mr. Reid's amendment would wreck the whole scheme:

> "What he suggests is that the doctors themselves should have the right, in any part of the country, to enter the public service at their own will, claiming something which no other profession has. When a person enters the public service, surely a nation is entitled to say where it wishes this service to be given. It is only some doctors who would claim that, at any time, they should be allowed, without any principle of distribution being exercised at all, without anything being asked of them, to attract public money——
>
> "Sir H. MORRIS-JONES: The right hon. gentleman is taking away from them the right which they have now, and they have never asked for that right to be taken away.
>
> "Mr. BEVAN: The hon. Member is quite right, but I wish to point out that doctors are not yet in sole control of the country. It is we who have decided that we are going to have a public health service, and, therefore, what we must do is to construct the principles which make that service practicable. Certainly the doctors have not asked as a body for a National Health Service, but the doctors have supported the National Health Service, and the proper organisation of the National Health Service implies that we must make available to the whole population an equal share of the doctors, and the only way in which that can be accomplished is by having a proper distribution of general practitioners. If doctors are allowed to go anywhere, the task imposed upon the scheme would be formidable and almost impossible to exercise, because we would never know where the doctors were going until they had gone."

If they wished to receive remuneration from the public service the State was entitled to attach conditions to the remuneration, and one condition was that the doctor should not serve where his services are not needed.

Mr. STRAUSS suggested another first principle—that doctors entering the public service should be happy in their professional work and should enjoy as much sense of freedom, and not as little, as was compatible with the necessary arrangements. The best judge of whether a district was over-doctored was the public in that district. Doctors in a barred area would have no stimulus to maintain their efficiency.

After further debate the House divided on Mr. Reid's amendment, which was defeated by 277 votes to 128.

PROHIBITION OF SALE OF PRACTICES

Mr. REID moved the omission of clause 35 dealing with sale of the goodwill of practices. We ought not, he declared, to mix up medicine and Socialism, but if he was not in order in saying that there was no need to abolish the sale of goodwill at least it ought to be done in a much simpler way. In future no doctor could sell his house to another doctor, enter into a partnership, or engage an assistant, without going to the Medical Practices Committee with a full and comprehensive statement. That would be a monstrous imposition on a busy man. Further the Minister could not guarantee that the doctor would receive an answer from the committee in a fortnight or even three weeks.

Mr. BEVAN pointed out that the State had set aside £66 million for compensation for the loss of goodwill; surely it was therefore entitled to take precautions to see that a doctor did not benefit twice. It had been agreed that local doctors should influence appointments to their district, and the further danger arose that a newcomer might offer financial inducement to local doctors to influence his appointment. He agreed that the original clause had been drawn very tightly—microscopically so—but it had been substantially amended in committee. The doctor now only had to obtain from the Medical Practices Committee, mainly a professional body of his own colleagues, a certificate that the transaction was a reasonable one. That was a defence in court against any action whatever. The point had also been made that a doctor might get himself into a difficulty innocently, and in a later amendment Mr. Bevan was introducing the word "knowingly" to make it clear that there must be awareness of the offence before it had been committed. He believed that the introduction of the protective registration by the Medical Practices Committee had largely reassured the medical profession.

The amendment was negatived by 305 votes to 110.

Mr. KEY moved amendments, which were accepted, ensuring that all trials would involve trial by jury and not by summary jurisdiction; that where a partnership or assistant agreement had been entered into before the coming into operation of the clause there could be no offence in accepting instalments previously agreed to.

DISQUALIFICATION

Mr. REID moved that disqualification of a doctor or other practitioner should be only "by reason of his failure properly to provide the services which he has undertaken." Under the Bill it was possible for a doctor to be dismissed by the Minister merely because the Minister thought he was a bad influence. The question was: Is he to be turned out because something definite has been proved against him with regard to his past actions, or is he to be turned out because his superior has no confidence in him? This was important because, as the service approached 100%, exclusion would mean professional death.

Mr. BEVAN said there were all kinds of reasons that might make a doctor a very bad person to employ, and he preferred the language of the original clause which permits disqualification if his continuance "would be prejudicial to the efficiency of the services in question." Before a doctor could be removed, however, something must be proved against him—something which made him, in respect of his being a doctor, a bad public servant. Mr. Bevan later explained that he could not claim to pass judgment on a doctor as a doctor; this was a matter for the General Medical Council. But if a doctor fell short of what was required by the National Health Service he was liable to be removed.

The amendment was withdrawn.

RIGHT OF APPEAL

Mr. BEVAN moved the reinsertion of the doctor's right of appeal to the Minister from any direction of the tribunal. In committee, he explained, this right had been deleted, but the alternative right of appeal to the High Court had not been carried, with the result that the doctors were deprived of one of their remedies.

The Minister and the doctor, or rather the executive council and the doctor, were, in some respects, in employer and employee relationship, and in accordance with constitutional precedents the employer could dismiss the employee without any redress. But in establishing this great service it seemed to him that it would be difficult, if not impossible, for doctors who were removed from that service to obtain a livelihood outside, and that special protection should be given to them against any possibility of injustice.

Describing the protection given under the scheme, he said, in the first place, there would be a medical subcommittee of the local executive council, consisting as to 50% of professional representatives. A complaint made against a general practitioner would be first examined by that subcommittee of the executive council. That was not in the Bill, but it would be determined by regulation. Then the executive council, again as to 50% of their membership professional people, would consider the complaint. Suppose that body decided the allegations were well founded, and that the doctor should be removed from the list. The doctor then had the right of appeal to the tribunal. At the moment the doctor had only the right of appeal against the local committee straight to the Minister. In no other profession was there this tribunal. He had interposed the tribunal between himself and the local executive in case the local executive council were prejudiced. The chairman of the tribunal would be a lay local person appointed by the Lord Chancellor. The doctor would be able to put his witnesses before that council to be cross-examined, to give evidence in person, and employ all the panoply of a legal tribunal. If the tribunal decided that the local executive were correct in their decisions the doctor had a further appeal, to the Minister, who would then institute an inquiry. The doctor would still have certain rights of appeal to the court. He could appeal on the grounds that the procedure laid down for his trial had not properly been carried out; that one of the tribunals had exceeded their powers; and that the principles of national justice had been violated. There was no inhibition against appearing before the court, because he was not a State servant.

How could a judge of the High Court better decide than the executive council whether a doctor had been an efficient servant of the service? Parliament placed upon the Minister the responsibility for providing a health service, and provided him with the instruments through which that service was to be given, but if one of the instruments was to be selected by the High Court judge, where did Parliament come in? After further discussion the amendment was carried by 296 votes to 129.

MINISTERIAL AMENDMENTS

Mr. KEY moved amendments to clause 59 and to the third schedule carrying out the Minister's promise to allow hospital management committees to receive gifts and hold land, and an amendment to clause 72 providing that the Minister should make special orders determining the areas of the regional boards and separate orders for the constitution of the regional boards.

POWER OF COÖPTION

Mr. WILLINK moved an amendment to the third schedule giving a hospital management committee power to coöpt not more than three people to be members of its committee. Mr. BEVAN resisted the amendment, as people with special interests could be appropriately coöpted to serve on subcommittees.

FROM THE PRESS GALLERY

Bread-rationing

In the House of Commons on July 18 Mr. WINSTON CHURCHILL moved the annulment of the Bread Rationing Order dated July 12. After careful consideration, he said, the Opposition could not feel convinced that bread-rationing was necessary on July 21. It was said that the pipeline contained only eight weeks' supply, and that the position would be dangerous by August 31; but by then we should reach the new home harvest. For September the Minister was counting on 250,000 tons from our own harvest, and so we need import only 150,000 tons to maintain the pipeline above the danger-point. According to those who knew the trade there would be no difficulty in importing 150,000 tons, and indeed far more, in September. After September we had the whole of our home harvest within our reach, and although the problem of our bread-supply might remain, its urgency would have vanished. Mr. Churchill asked for an explicit assurance that the Government adhered to their statements that the scale of bread-ration in this order would not be further reduced. He agreed that if the Government felt that there might be a breakdown in supply in certain localities they were bound to prepare rationing machinery; but it would be best to prepare a scheme on better lines during the next few weeks, after full consultation with the trade, and not enforce it till the necessity was proved. While he thought that the bakers had been ill treated in this matter, he strongly advised them to make work as well as possible whatever scheme was thrust upon them by the Government on the authority of Parliament.

Mr. JOHN STRACHEY said that the Government regarded September as the month in which we could legitimately hope for the beginning of a recovery in our stock position; but it would be rash to expect any but a minimum importation of Canadian wheat and a much lower importation than usual; for, in a largely successful effort to get the world through this desperate situation, the Canadians had run their stock position down to an unparalleled degree. The prospects were appreciably brighter than when the House last debated the matter; but, after all, the new crops had not yet been reaped. He assured Mr. Churchill that it was quite impossible to import 150,000 tons of wheat, or any comparable amount, in September. He agreed, however, that if the prospects improved, bread-rationing might be discontinued much earlier than seemed possible a few weeks ago. To postpone its introduction beyond July 21, however, would mean that it would not provide the necessary insurance against the various uncertain factors of the period in which our stocks would be dangerously low.

In the subsequent debate Mr. E. F. M. DURBIN said that the great difficulty inherent in any system of bread-rationing was the immense difference in the food requirements of individuals. If the scheme was to be criticised at all it was on the ground that the principles of differentiation and the categories were not sufficiently complicated. Unfortunately, the obvious sources of difference of size, rate of growth, and output of physical energy were not the only, or the most important, source of quantitative difference between different people in their calorie requirements. Work done at Cambridge some years before the war had shown that there were congenital differences between individuals, not associated with their size or output of energy, that could cause as much as 100% difference in the calories needed to maintain their body-weight. That was a difficulty which brought grave danger into any system of rationing of the calorie buffer which was based upon average. Quite apart from size or ways of life, one family might need twice as large a daily intake of calories as other families. There was no conceivable system of rationing based upon averages that could take account of such wide differences. True, there would be only perhaps one family in 20, or even one in 100, that aggregated would require much more food than other families. But however small the number of families might be whose health and weight would be affected by rationing, their existence would go far to discredit the scheme. The Minister should set up some method of appeal, or some form of medical diagnosis, which would save the nation from the shame of having starving families in its midst.

Dr. EDITH SUMMERSKILL, parliamentary secretary to the Ministry of Food, said that, if necessary, adjustments could be made in the scheme.

The motion to annul the order was negatived by 305 votes to 182.

QUESTION TIME

Alien Medical Practitioners

Sir HENRY MORRIS-JONES asked the Minister of Health on what date the temporary registration scheme for alien medical practitioners expired; and what was the policy of His Majesty's Government in regard to these doctors, particularly those of allied nations.—Mr. A. BEVAN replied: Under the Emergency Laws (Transitional Provisions) Act, 1946, the scheme expires on Dec. 31, 1947, unless the relevant Defence Regulation is revoked earlier by Order in Council. Future arrangements are under consideration and it is not yet possible to make a statement on the subject.

Diphtheria Immunisation

Mr. PETER FREEMAN asked the Minister of Health how many children had contracted diphtheria after immunisation since the practice was first introduced; how many fatal cases had occurred after being immunised during the same period; what information he had of temporary or permanent injury to the health of such children following immunisation; and to what extent such children had been proved to be more likely to be subject to other diseases or illness in later life.—Mr. BEVAN replied: Returns from local authorities in England and Wales show that between January, 1940, and June, 1945, diphtheria notifications and deaths respectively numbered 19,040 and 142 among immunised children, as compared with 141,600 and 3635 among children not immunised. Of some 6 million children immunised in England and Wales 14 cases have come to notice of later illnesses in the possible causes of which, I am advised, the diphtheria prophylaxis cannot be positively excluded as having had no part. I know of no evidence to support the suggestion in the last part of the question.

In England Now

A Running Commentary by Peripatetic Correspondents

IT'S difficult to describe in a few words what things are really like here in the Ruhr. There isn't a famine—not properly—but there is not enough food, and what there is is badly distributed. That means the rich and influential and the farmers are pretty well off while the poor are in a bad way. When the official ration was reduced to 1000 calories the black market took most of the shock and disgorged enough to prevent actual famine in the population. But closed institutions like asylums and orphanages were badly hit. That was the biggest miscalculation, and it has been partly rectified now by the addition of 700–800 calories. Weight-curves for nearly every age-group are still going down, but the new crops are coming in and there is hope that next winter won't be so bad.

The destruction here is just awful. I'm getting used to it now, but it's worse than any of the accounts I had read, so it took my breath away at first. It's difficult to imagine where and how—or for that matter why—the people go on living. There is apathy everywhere; not much coöperation and not much resistance. We all feel sorry for the Germans, which is rather strange when you think how we felt about Coventry and Stalingrad. The black market is terrific. One cigarette is equivalent to about 2*s.* 6*d.* You cannot help subscribing to local custom and paying for personal services in cigarettes, which will buy food, instead of in marks which will buy very little. Anything worth while—cameras, glasses, &c.—cannot be got for money. Cigarettes are the real currency. Farmers will disgorge food for cigarettes, and it is they who decide it all. It's a most crazy system. I wish I understood the psychology of it all.

* * *

The arm of coincidence, you will recall, like that of the law and the chimpanzee, is traditionally long. Recently a lady came to outpatients whose husband had contracted T.B. during his $4^1/_2$ years' imprisonment in the Far East and was anxious to make sure that she had not become infected. The next day I had to see a patient out of town and decided to lunch at the terminus hotel. A table was reserved by telephone, but on my arrival the maître d'hôtel, undaunted by having allowed all the single tables to be occupied, waved me to a vacant seat at a table for two with the usual gracious gesture. Yes, Gentle Reader, you have guessed it; the other occupant was my patient of the day before. In conversation it appeared that it was equally not her habit to lunch there, but she had aimed to forestall her husband's chiding about her sandwich habits. No doubt when I have seen the X ray, the sputum report, and the B.S.R. I shall see the lady for the last time. In any case I have promised my wife that this Brief Encounter will not proceed in the manner of Mr. Coward's excellent film.

On my journey I recounted my adventure to a fellow passenger, who told me that he was travelling one day by Tube and like many others standing near the doors when the train stopped at a station and the first passenger to be impelled into his arms was his father, who had unexpectedly come up from the country for the day. No doubt each time I repeat my story my listener will cap it from his own experience. When I told it to a colleague he remarked that he knew a G.U. surgeon whose car registration number begins YP.

* * *

I learned of some quaint old American customs through pressure of accommodation in Washington leading me to stay at what we should call a superior boarding-house. In spite of the American passion for plumbing, the cold tap invariably delivered hot water and vice versa—a pleasant variation on conditions on the Continent where both taps deliver cold or nothing. A notice of "house rules" on the door forbade the entertainment by guests of persons of the opposite sex in their rooms unless they were ill and a doctor was in attendance; this had naturally provoked some ribald comments on our profession scribbled by previous tenants. I also noticed that the key-hole in the common bath-room had been stuffed up with toilet paper against emergencies. But perhaps it was just as well I had not succeeded in getting into a high-class hotel, since a British colleague was startled one evening to find that a box of chocolates, put on the window-sill to keep them from melting, was full of blood. It seems that a gentleman in the room above had cut a lady's throat and thrown her down four stories, following later himself, both being appropriately clad for the present hot weather.

* * *

Macaulay's New Zealander, had he stood on Westminster Bridge at 9 A.M. on July 16 to gaze on the ruins of St. Thomas's Hospital, would have been reminded of his native hot springs, for a bitterly cold north breeze, meeting the Thames water running off the sun-drenched land, caused volumes of steam to pour along its surface like clouds from a bathroom—a crazy effect, like that of a man advertising "Ices all hot."

* * *

After attending one or two interviews, as another correspondent observed a few weeks back, one comes to belong to a definite, but one hopes diminishing, band of brothers. Next time I go up for one of these occasions I know exactly whom I shall see. At the first session we were all there. We said nothing to one another, but sat as far away as possible and read the books which the residents had thoughtfully left about—I had been provided, rather appropriately, with a study of the post-mortem findings in suicide; the others looked as if they'd found something similar. Everyone looked sideways at his fellow and tried to decide by his clothes and facies if he had a Service record and membership. The civilians looked apprehensively at the man in uniform with a M.C. ribbon up. That job was awarded in the menagerie, so next week we all met again. This time we got a little closer together and decided that psychiatrists were a bad thing, and that State medicine would get us all up earlier in the mornings. Our third meeting was quite chummy; our fourth almost hilarious; I think our fifth will adjourn to see "Sweetest and Lowest." A pity if one of us is appointed before then.

Meanwhile we are founding a learned society, with a *Journal of Experimental Candidature.* We shall invite papers from all fellow-sufferers. In dividing up research, the M.C. bagged the department of Snap Physiognomy; he will work on sizing up fellow runners and the personnel of medical boards—those miscellaneous faces who ask you questions and tell you to wait outside. He is practising in Madame Tussaud's. I mean to study the psychology of rudeness, as exemplified by some governing bodies. I am collecting statistics, indexed something like this:

Time of appointment, 6.30 P.M.
No. of persons short-listed, 15.
Time when interviewing actually began, 8.47 P.M.
Interval between interview and receipt of notice of non-appointment, 2 months.
Behaviour of board, bland.
No. of persons who travelled from the Provinces for this interview, 5.

My tame psychologist shrugs and says, "Well, you didn't get the job—aren't you projecting your frustration, &c.?" I hope not: one or two of my cards are less discouraging. Take the hospital which short-listed 5, saw them within fifteen minutes of zero hour, notified the eliminated persons at once, and wrote three days later to inform us all of the name of the successful candidate and to thank us for having attended.

If the learned society doesn't show itself sufficiently learned, we may turn it into a Candidates' Defence Union. If you see a sandwichman outside the Hospital for Old Soldiers with a notice saying UNFAIR, that will be me.

* * *

If the State Medical Service does get us up earlier, I hope *The Lancet* will become a daily. Friday is the only day I am not late for breakfast, and I have *The Lancet* to thank for it. Not that I am so wild to see if the formula of folic acid is out yet that I rush down and wait at the letterbox. The effect is a purely mechanical one. We have no internal doormat, and the crash as *The Lancet* arrives would wake anyone. Hence the probable need for a *Lancet* every weekday except Saturday when, of course, we in the State Service will have our day off. It need not contain much original matter—a sizable piece of wood would serve—but if it appears on Saturdays I shall ask the editors to upholster the ends.

Reconstruction

REGIONAL BOARDS

FROM A CORRESPONDENT

"THE Regional Board," said Mr. Bevan in the standing committee, according to the official report (May 23, 1946), "is a bit of an obstruction." No doubt he said "abstraction," and the word more familiar to the shorthand writers crept into the report.

Mr. Bevan is quite right. The regional boards will indeed be something of an abstraction. The real work will fall to the hospital management committees, while the function of the regional board will be to canalise the authority flowing from the Minister—to inspire, to coördinate, and to supervise. We know that the boards are to comprise unpaid personnel chosen for their individual qualifications and their knowledge of hospital affairs. It is obvious that many of their functions will involve delegation—to subcommittees and to individuals, whether paid officers or not—whose advice and guidance will carry much weight with the hospitals. Critical discussions on the make-up of the regional machinery are now taking place behind the scenes; and it is much to be hoped that, when the draft of the regulations emerges, it will be found that those concerned have resisted the temptation to follow the already old-fashioned hierarchical pattern. An attempt, therefore, to distinguish possible alternative lines of development may not be untimely.

Two conceptions are competing for supremacy, very different in their probable ultimate effect on the success or failure of the scheme. It is one of the difficulties that it is far from easy to find terms by which the opposing conceptions can be clearly described and discussed.

THE SERVICE CONCEPTION

On the one hand, we have the comparatively simple "service" conception of the regional organisation, with departmental officers and staff, each possessing their defined sphere of responsibility, directing and inspecting the various departments of hospital activity. Thus, to take one or two examples at random, we should have a regional nursing officer responsible for the standard of nursing throughout the hospitals, without whose assent a matron would be foolish to venture upon any innovations in nursing technique or organisation. We should have a regional financial officer, without whose blessing no hospital committee would care to incur expense for which there was no precedent. We should have, too, a regional architect, to whom projects would stand referred for translation into plans and estimates.

The advantages and economies of such a scheme are not to be underestimated. In hospital affairs today the field for the expert is very large. The objections to this form of organisation are, however, serious. It is not really possible to elevate the status of the regional officer without derogating from the status and responsibility of the corresponding personnel in the hospitals; and, in the long run, the field for initiative and ability is narrowed down. An immediate technical improvement is bound to be followed, as the years pass, by loss of interest and a passivity on the part of the best men and women in the hospitals. If these people begin to feel that wisdom lies not in making their own decisions but in ensuring that their activities will commend themselves to the regional officers, heaven help us.

THE ALTERNATIVE

The alternative conception of the method by which regional influence may be exercised is much more difficult to describe and to formulate, and what follows is but a halting attempt to indicate some of its features.

Must the region possess professional specialist staff at all? If so, then let us remember the relationship between the sector organisation of the E.M.S. and the hospitals in the sector. A cardinal feature was the plan whereby authority was vested in professional personnel—medical, nursing, and administrative—who themselves already occupied posts of responsibility at the principal hospitals concerned. Despite shortcomings here and there, the merits of this plan have been obvious. Policies have been formulated with instinctive knowledge of the difficulties that would arise in their execution. Hospitals have taken their problems to the officer concerned, with the certainty that he (or she) would meet them, not with the arbitrary authority of the official, but with the sympathy born of experience. Is it too much to hope that in the region a similar plan will be followed, and that it will be made a golden rule that no-one shall be appointed to a post carrying regional authority who does not already and concurrently hold a "key" position in his or her respective sphere?

Such a plan is not, however, in itself an all-sufficient guarantee against arbitrary decisions. The procedure must provide for the give and take of discussion; and here an example may be drawn from the experience of the King's Fund. For many years past the fund has exercised an acknowledged influence over the voluntary hospitals in the metropolitan area which has in part foreshadowed and suggested the functions that may be expected from the regional boards. The visitors appointed by the fund have been drawn from among the ranks of the consultant staffs of the hospitals; their reports have been made to committees of the fund, with elaborate precautions to ensure that where an adverse comment is considered to be justified the hospital concerned is afforded an opportunity to state its case to the fund. Proposals for extension have been referred to the fund, and much valuable advice has been given, but always in discussion across the table between responsible subcommittees of the fund and the accredited representatives of the hospital. Advisory services, as in the case of hospital diet, have been instituted; but there has been no attempt on the part of the fund to use the power of the purse to impose a cut-and-dried pattern upon the hospitals within its sphere. Is it too much to hope that in these all-important matters of procedure, too, the regions may profit by the experience already available?

It is perhaps impossible to find a word or a phrase that adequately describes this general approach, and effectively contrasts it with the "service" model. The clue seems to lie in two things: first, in ensuring that authority in each sphere is retained in the hands of those who are professionally the equals of those over whom it will be exercised; and, second, by adherence to the principle that, whenever questions of policy arise on which opinions may differ, decisions shall be reached, not by an official applying to the papers on his desk criteria of some central policy, but always in discussion across the table with those responsible for the execution of the project.

Much will depend on the wisdom of the chairmen of the regional boards and their chief executive officers. In the meantime let us hope that the Minister and his advisers are awake to the danger, and that nothing will be done which would tie the hands of the regional boards and set the mould on "service" lines in a way that would preclude the development of a more wholesome tradition. At times the Minister has seemed to speak with real appreciation of the danger. He has assured us that one of the attractions of his plan is the fact that it will not involve the creation of a single additional civil servant; but at other times disquieting phrases have crept in, sufficient to indicate that the struggle between the two conceptions has not yet been resolved.

Special Articles

MEMORANDUM ON B.C.G.

A BRITISH REVIEW

In 1943 the Tuberculosis Association, in conjunction with the Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis, decided to submit to the Minister of Health a joint request that B.C.G. (Bacille Calmette-Guérin) vaccine should be made available for trial in this country. The following is a summary of the memorandum, prepared on behalf of these bodies by Prof. W. H. Tytler, which has now been presented to the Minister of Health and the Secretary of State for Scotland.

ABSENCE OF VIRULENCE

The failure hitherto to provide completely satisfactory artificial immunisation may be due to inherent characteristics of the tubercle bacillus. Of two possible systems —(1) the application of dead bacilli and (2) actual infection by living bacilli of strains which have no power to cause progressive disease—the latter has given the more promising results. Immunisation by living bacilli, both with attenuated strains of true tubercle bacilli and with related bacilli of low pathogenicity, has been studied extensively in animals, and some success has been attained. So far, however, only the B.C.G. strain has produced significant immunity and at the same time proved safe enough for use on human subjects. Its only prospective rival is the vole bacillus of A. Q. Wells, which has given promising results in animals; but neither its efficacy nor its safety has yet been firmly established.

In 1908 Calmette and Guérin announced that a particular strain of bovine tubercle bacillus, cultured on potato with added ox-bile, had rapidly lost its virulence. Twelve years later they reported that this B.C.G. culture was harmless to man in intravenous doses of at least 44,000 bacilli; this established its safety for immunisation of cattle, even should the bacilli be excreted in the milk, and at the same time pointed the way towards its use in human vaccination.

According to Calmette, the B.C.G. strain in 1921, after 230 successive passages on glycerinated ox-bile potato medium, was incapable of causing progressive tuberculosis in any animal species, though very large doses might cause death, as may dead tubercle bacilli; it was a *virus fixe*, with complete and permanent loss of virulence. Against this, some workers claimed to have demonstrated a certain degree of virulence, under special conditions of culture or by animal passage. Others who were unable to find any evidence of the return of virulence ascribed the positive findings to such factors as contamination of cultures by virulent tubercle bacilli, to mistaken diagnosis of tuberculosis in animals, and to spontaneous infection in crowded animal-houses. None of the positive results were obtained under the conditions laid down by Calmette, and all were reported during the first 8–10 years after B.C.G. came into general use.

That the B.C.G. culture may vary in its power to produce lesions and may largely lose this power and that of producing immunity is suggested both by experimental work on animals and by analysis of human vaccination. But the best evidence of its safety is the absence today, after two or three million vaccinations on man, of a refutal to Calmette's assertion that no single case of tuberculosis could be traced with certainty to B.C.G. infection. What opposition still exists is largely rooted in the Lübeck disaster of 1930, when, of 249 children who were given by mouth what purported to be B.C.G. vaccine, 73 died within a few months. It was decided by the German courts, admitted by the director of the laboratory concerned, and accepted by visiting scientists that the deaths were due to contamination or replacement by virulent bacilli. The Kiel culture, which was maintained in the same laboratory, gives a characteristic green colour, never seen in any known strain of B.C.G., but identified in cultures from the fatal cases and in the remains of the vaccine suspension.

EFFICACY OF B.C.G. VACCINATION

Animal experiments show beyond doubt that in most species immunity in some degree follows vaccination with B.C.G. The evidence of immunity in man following vaccination rests on (1) the development of a positive tuberculin reaction, with presumption of parallel immunity, and (2) morbidity and mortality statistics in the vaccinated and unvaccinated.

Reactor-rates.—The results of vaccination by oral administration among children of healthy parents are shown in table I.

The steady rise in each group and the higher rates under conditions of exposure strongly suggest that natural infection plays an important part; and the large residue of negative reactors raises doubt as to the number of these in which an actual infection by B.C.G. occurred. Calmette claimed, on experimental evidence, that immunity could exist without allergy, which appears from more recent work to be true in a qualified sense. Wallgren found that the allergy after B.C.G. vaccination was usually of too low a grade to be demonstrated clearly by the Pirquet method, and he obtained much higher positive rates by the Mantoux test. It is, therefore, probable that many of the Pirquet-negative children in this series were actually infected. Even if it is accepted that the higher rate among exposed children results from natural infection contracted despite vaccination, this does not necessarily indicate absence of immunity. Such a natural infection, resisted or limited by partial immunity due to B.C.G., was anticipated by Calmette as a desirable result, which would produce a firm and lasting immunity without danger of progressive disease. This sequence of vaccine immunisation, followed by a resisted natural infection, represents perhaps the most effective means by which a lasting immunity may be built up by artificial methods. But it is difficult to assess the results of oral vaccination on the basis of reactor-rates or of mortality statistics.

TABLE I—MOUTH VACCINATIONS IN CHILDREN

No. vaccinated	Reactor percentages (months) at—				
	3 m.	*6 m.*	*12 m.*	*18 m.*	*24 m.*
302, in healthy environment	4·5	5·1	14·2	21·6	23·3
152, in tuberculous environment	14·7	20·0	35·1	40·9	50·0

From 1924 subcutaneous vaccination was widely adopted, and in 1930 it was reported from Norway that, of 136 nurses so vaccinated, 109 gave positive reactions at 6–8 weeks and the remainder at 3–24 months. In 1145 young adults the rates varied in different groups from 31% to 81%.

By intracutaneous injection, adopted by Wallgren in 1927, 95% reacted at 6–7 weeks, and almost 100% at 16 weeks, some after revaccination.

In 1939 Rosenthal, of Chicago, described the method of multiple needle puncture of the skin, made through B.C.G. suspension spread on the surface. Its efficiency and its outstanding advantage—the lack of abscess formation—have since been amply confirmed. A series of linear scarifications with a vaccine stylet is preferred by some to multiple punctures; with this method 700 primary inoculations gave nearly 100% reactors at 2 months.

In 1943 the Norwegian vaccinations are reported to have numbered 13,515, with 95% reactors; and in 1944, 17,579, with lower reactor-rates. The drop was ascribed to a probable decrease in virulence of the B.C.G. strain. Rydén has reported this year that nearly 100%

TABLE II—DEATHS AMONG INFANTS, AGED FROM 1 MONTH TO 4 YEARS, IN CONTACT WITH TUBERCULOSIS

Group		Cases	Deaths (%)	
			Tuberculosis	All causes
French children born of tuberculous mothers and either not separated or else living in a tuberculous environment	Vaccinated	2368	2·8	11·8
	Non-vaccinated	4854	15·6	20·5
Lancashire children in house contact with tuberculosis, and observed 4 years	Contact sputum +	329	2·73	10·64
	Contact sputum −	114	0·87	11·52
Total		443	2·26	10·61

of 15,000 persons vaccinated in Sweden became reactors. Reactor-rates in infants have usually been lower, but in 3299 newborn infants vaccinated intracutaneously over 4 years, the rate rose from 84·5% in 1942 to 95·7% in 944, with a drop to 92·4% in 1945.

Morbidity and Mortality Statistics.—Calmette's figures, ublished in 1928, showing the effect of B.C.G. vaccination n infancy on deaths through tuberculosis, have been set gainst deaths in a comparable non-vaccinated Lancahire group (table II).

The Lancashire figures for non-vaccinated house-ontacts are lower than the French figures for vaccinated; ut Calmette always emphasised the greater relative advantage of B.C.G. in conditions of severe exposure; and it is probable that these conditions existed to a much greater extent in his material than in the Lancashire series. Later, Calmette gave enlarged figures of deaths from tuberculosis for the same group as vaccinated 2·4% and non-vaccinated 15·9%. Similar results were recorded in the Pasteur Institute report of 1932 for countries other than France. The death-rate from all causes in the first year of life among the vaccinated, who numbered 443,656, was 7·9%, whereas in the non-vaccinated it was 15·3%.

Allowing for uncertain factors, most authorities have the impression that oral vaccination lowers the death-rate from tuberculosis in the first year of life. More reliable evidence comes from smaller series, where the vaccine was given by injection and controls were adequate: in Gothenberg B.C.G. was from 1927 given intracutaneously to all children of tuberculous families, normally at birth and otherwise up to the age of 6–7 years. Subsequent observation was complete for all children to the end of 1932. The infant death-rate from tuberculosis from 1912 onwards was used as a basis for comparison; this rate shows a sharp drop beginning in 1928, while the adult rate for pulmonary tuberculosis shows only the gradual fall observed throughout the world (table III).

TABLE III—DEATHS FROM TUBERCULOSIS IN INFANTS AND FROM PULMONARY TUBERCULOSIS IN ADULTS, AT GOTHENBERG

Group	Deaths per 10,000					
	1912–16	1917–21	1922–26	1927	1928–32	1933
Infants ..	43	42	34	39	14	3
Adults ..	20	17·6	13·5	12	11·4	10

Infants were vaccinated with B.C.G. from 1927.

The immunisation of uninfected young adults exposed to abnormal risks of infection, such as, for example, nurses and medical students, has yielded equally definite evidence of the efficacy of B.C.G. This development originated chiefly in the studies of Heimbeck on pupil nurses at Ulleval Hospital, Oslo. His results and those of similar studies in other countries have caused the traditional belief that adult disease represents an extension of childhood infection to be replaced by a growing conviction that in the young adult it is much more commonly the result of a new infection, either in a person previously uninfected or in one who has been infected in childhood and, having recovered completely, has lost all allergy and immunity in the intervening period. At Ulleval Hospital, 50–60% of pupil nurses were found to be non-reactors on entry, but their susceptibility was proved by most of them becoming reactors within the first year of hospital life, and all within the three years of training.

Table IV indicates not only the greater probability of tuberculous disease occurring in the previously non-infected but the higher risk of infection run by nurses in hospital, as compared to women in the general population. It is now being accepted that (1) adolescents and young adults, particularly women, who are non-reactors to tuberculin are more susceptible to tuberculous infection than those in whom previous infection is indicated by a positive reaction; and (2) young adults in frequent contact with tuberculous patients are exposed to a greater risk of tuberculous infection and disease than is the general population. The Oslo figures leave little doubt that the non-reactor nurses who were vaccinated enjoyed a large advantage over the non-vaccinated. Moreover, this advantage was related to the development of allergy following the vaccination; it was much slighter among those who remained non-reactors, which strongly suggests that the effect was one of true specific immunity.

TABLE IV—INCIDENCE OF ALL FORMS OF TUBERCULOSIS IN NURSES AND IN GENERAL POPULATION

Group	Cases	Observation-years	Tuberculosis (per 1000 observation-years)	
			Disease	Deaths
Nurses at Ulleval:				
Tuberculin-positive at entry ..	625	2659	10·1	0
Tuberculin-negative at entry—				
Not vaccinated	280	561	171·0	17·8
Vaccinated, B.C.G.—				
Becoming positive ..	287	910	8·8	1·1
Remaining negative ..	107	204	107·9	9·1
Females, aged 13–24 years, general population, Oslo:				
Tuberculin-positive	467	2111	6·6	0·5
Tuberculin-negative	991	4697	11·1	0·6

For calculation of observation-years, tuberculin-negatives remained classed as such to one year after showing a positive reaction, on the basis that any disease observed during that year is part of the primary infection.

The following conclusions on the efficacy of immunisation by B.C.G. appear to be justified.

1. Statistical data derived from oral vaccination of the newborn are unsatisfactory because of uncertainty of B.C.G. infection, lack of control, and difficulty of separating specific from non-specific factors. But there can be little doubt that the vaccinated groups—perhaps two to three million in all—have shown a decidedly lower mortality from tuberculosis during childhood years than non-vaccinated infants in the same communities.
2. The smaller, but much better controlled, series based on parenteral injection of B.C.G. in children yield a similar but more precise result.
3. The data collected from systematic observation of pupil nurses show, first, that the risk of developing tuberculous disease is greater in the non-reactor than in the already infected reactors; and, secondly, that among original non-reactors who have been vaccinated with B.C.G., the disease has been reduced to a level approaching that among the reactor group.

DURATION OF IMMUNITY

Information on the duration of immunity following B.C.G. vaccination is scanty. Calmette and most of his contemporaries suggested that it was of the order of 2 to 4 years at the most; but recent series from Norway and Sweden suggest that with improved methods of application, the duration, by inference from that of allergy, may be five to six years or more. Calmette believed that immunity outlasts allergy. With human vaccination the only event that gives any precise evidence of the duration of immunity is the disappearance of the positive tuberculin reaction; but according to Calmette, this is not proof that immunity has vanished. At the same time, a continued absence of natural infection is no proof that immunity still exists; nor, on the other hand, is occurrence of natural infection, whether the reaction be positive or negative, proof that no relative immunity exists.

Recent large-scale vaccinations in Norway and Sweden show both higher reactor-rates and longer persistence of allergy than did earlier series; but on the whole the proportion of reactors has been decreasing somewhat after 2–3 years. The longer a strongly positive reaction persists after that time, the greater is the presumption that natural infection has occurred; and if there is a marked or sudden enhancement of the reaction, the presumption becomes very strong. But an enhancement of B.C.G. immunity by a natural infection which the vaccinated subject can resist is an expected and desired event, and where a positive reaction persists indefinitely, no further immunisation is indicated. Only where a positive reaction following vaccination has disappeared is revaccination called for; and if the Mantoux reaction is completely negative at O.T. 1 in 100, there is no contra-indication. Calmette suggested that revaccination should be undertaken at 1–3 years, and possibly again between 7 and 15 years, but a more reliable system would seem to be yearly testing, with revaccination of completely negative reactors. This question requires further investigation.

METHODS, DOSAGE, AND LOCAL LESIONS

Whatever the method of vaccination, it is essential that the subject, whether previously infected or not, should be non-allergic at the time; and the possibility of allergy developing shortly after vaccination, due to infection in the previous 4–6 weeks, should be excluded by segregation from tuberculous contact. The newborn are assumed to be non-infected and non-allergic. This rule does not appear to be observed in the case of nurses and other adults. Calmette prescribed a further segregation of one month after vaccination to allow immunity to develop, but this has often been neglected. Wallgren has emphasised the irregularity in duration of the pre-allergic stage, and insists that the post-vaccination segregation should last until a positive reaction is obtained; those still negative at 6–7 weeks are revaccinated.

For oral vaccination, Calmette prescribed three doses of 100 mg. each, given on the 4th, 6th, and 8th or 5th, 7th, and 9th days of life. Few symptoms resulted, but polyadenitis was occasionally observed.

For subcutaneous injection, small doses of 0·01–0·05 mg. have been generally favoured. The relation of abscess-formation to dosage is reputedly irregular, but the risk of it is diminished by deep injection into loose subcutaneous tissue, as in the axillary region. With small doses, abscesses have developed in about 30% of those vaccinated.

For intracutaneous injection, Wallgren used doses of 0·05–1·0 mg., and observed no troublesome lesions. Foci seldom exceeded pea-size, with slight liquefaction, and healing ensued in a few weeks. Others, while agreeing that larger doses are tolerated by the intracutaneous route, and recommending 0·15 mg. as the optimum dose, report more serious reactions; abscesses in about 6% of those vaccinated were recorded in a recent series.

In 1939 Rosenthal described his method of tangential needle punctures made through B.C.G. suspension spread on the skin in a concentration of 5 mg. per c.cm. Négre and Bretey confirmed his successful animal experiments, but replaced the repeated needle punctures by superficial linear scarification with a vaccine stylet, through a B.C.G. suspension of the same concentration. Four drops of B.C.G. suspension are placed on the skin, and through each drop two linear cuts are made at right angles, each 1·5 cm. long. The local reaction is usually slight, reaching a maximum at 10–30 days. There is no appreciable lymph-node enlargement; and after 2–6 months the site is sometimes not identifiable.

With the puncture method, over 95% have reacted at 2 weeks, and 100% at 4 weeks, and the reaction has been maintained for over a year. In 3·8% of another large series, pus was noted in the small papules that develop, but the lesions healed promptly. The method of repeated punctures is probably slower than scarification, but an automatic spring instrument, making 40 punctures at one stroke, has been devised. Each of these two transcutaneous methods appears to be preferable to both the subcutaneous and intracutaneous methods, in freedom from abscess-formation and in rapidity of appearance, degree, and duration of the allergy produced; they appear, moreover, to confer rather better immunity.

PREPARATION OF VACCINE AND SAFETY CONTROLS

The original loss of virulence of B.C.G. was ascribed to prolonged culture on bile media, and, after 1921, when the strain was found to be completely avirulent, it was still laid down that it should be periodically returned to bile. The culture was maintained on glycerin veal-broth potato, subcultured every 20 days; but after each 10 such passages, two successive subcultures were made on glycerin ox-bile potato. In 1930 Calmette omitted the return to bile, and used the glycerin veal-broth for maintenance; this is still the practice in some countries, while in others bile media, Sauton fluid media, or glycerin-egg media are employed.

Calmette recommended that cultures used for suspensions should not be older than 20–25 days. Small quantities are prepared direct from potato cultures, larger amounts from bulk cultures on Sauton media. Suspensions should be used within a week of preparation.

Control Measures in Production.—Because the suspension depends for effectiveness on the development of a minimal actual infection from living bacilli, neither heat nor antiseptics may be used to exclude pathogenic contamination; moreover, animal tests for virulence or contamination cannot be completed before the vaccine is used. Consequently strict control of production is essential. The conditions for safety are these:

1. Lack of capacity of the B.C.G. strain to produce progressive disease. The avirulence of B.C.G. is now well established, but animal inoculation should be undertaken once for each batch to meet possible claims arising where tuberculous disease appears within a year or two of vaccination.
2. Absence of contamination by virulent tubercle bacilli from outside sources. Since the Lübeck disaster, it has been accepted that preparation should be carried out entirely in a laboratory, and preferably in a building into which no other culture of tubercle bacillus and no tuberculous material are allowed to enter. Infected workers must be excluded by examination, and masks must be worn at appropriate stages. All apparatus must be reserved exclusively for B.C.G. preparations.
3. Absence of other pathogenic bacteria. Aerobic and anaerobic cultures before the issue of the suspension should provide sufficient test. All infected material and all cultures should be excluded from the laboratory, and masks should be worn when the suspension is exposed.

4. It is also desirable to control the retention by the culture of the power to provoke local lesions. Jensen, in Denmark, inoculates guineapigs intracutaneously with doses of B.C.G. graded from 0·01 mg. to 0·0001 mg.; his stock strain gives frequent nodules at 0·001 mg., and large ones at 0·01 mg.

GENERAL STATEMENT

The bodies sponsoring the memorandum ask that the use of B.C.G. should be encouraged, but feel strongly that its employment should not be allowed to discourage the search for more efficient means.

When Calmette advocated the administration of B.C.G. to newborn infants, he believed that it would provide sufficient protection to prevent a natural infection during the first year or two of life, and that sufficient resistance would remain to enable later infections to be overcome and to leave in their turn the higher grade of immunity associated with such recovery. This sequence represents perhaps the most effective result which any form of artificial immunisation can produce. B.C.G. vaccination was advocated especially for children exposed to special risks, and it has been among these that the most successful results have been claimed in France.

Another application of preventive inoculation is the immunisation of adolescents and young adults who are non-reactors to tuberculin. The value of pursuing this aspect has been shown in the vaccination of young nurses in Norway, where immunisation of non-reactors has been followed by a significant decrease in morbidity- and mortality-rates as compared with unimmunised non-reactors, though both rates remain higher in the vaccinated than among the naturally infected reactors. The need for vaccination of this group in Great Britain is shown by the reports of the Prophit Trust investigations. The suggestion is that it should be available, though not compulsory, for non-reactor nurses. This would provide not only a practical safeguard against tuberculosis but a controlled investigation of the first value; there is little doubt that the results would be substantially the same as those obtained in Norway.

The introduction of the transcutaneous method, with its elimination of local abscesses, is felt to be an advance of the first importance; up to 1944 Birkhaug vaccinated 1500 persons with a spring-actuated puncture instrument; 98% became reactors and abscesses developed in none. There appears now to be no reason why B.C.G. vaccination should cause greater inconvenience, or rouse greater prejudice, than does prophylactic immunisation against diphtheria.

It is believed that:

1. The harmlessness of B.C.G. is established beyond doubt.
2. A very considerable degree of immunising efficiency is indicated by the most reliable results from other countries.
3. There exists in tuberculosis services and among the medical profession generally a desire that a reliable supply of B.C.G. vaccine should be available here, as it has been for years in other countries of the world.
4. The application by multiple puncture or by scarification promises to remove the risk of local abscesses, which has been one of the most serious obstacles to the general use of B.C.G.

On these grounds it is requested that the supply and use of B.C.G. vaccine in Great Britain should be facilitated and encouraged.

In the production of B.C.G. for general use it appears to be essential that: (1) the material should be actually safe; (2) there should be public confidence in its safety; and (3) control of production should be such that any claim of tuberculous disease being due to vaccination should be refutable with certainty. It is believed that, to attain these objects, there should be a single source of supply for Great Britain and that commercial competition should be avoided. It is also felt that the product should be supported with official backing, by being prepared under the auspices of a Government department or the Medical Research Council, or by certification of the methods employed which should be provided by an official department, such as the standards department of the Medical Research Council. Failing manufacture under Government auspices, it is felt that production should be controlled by some scientific organisation of national repute, which should be subjected to official supervision and certification. Considering that in Norway, during enemy occupation, the number of vaccinations was increased from 603 in 1939 to 17,579 in 1944, it does not seem impossible that an adequate and reliable supply should be forthcoming in Great Britain.

SOCIAL AND ECONOMIC RESEARCH

NEEDS AND MEANS

A COMMITTEE has been considering "whether additional provision is necessary for research into social and economic questions." Its report[1] doubts whether, even yet, the practical value of knowledge in these various fields is generally appreciated.

> "It is a platitude that modern industrial communities rest on a knowledge of the subject matter of the natural sciences. It should be also a platitude that their smooth running and balance rest upon a knowledge of the subject matter of the social sciences. . . . In simpler societies it may have been safe to base social policies on hunch and traditional wisdom. But in more complex conditions such a basis is not enough. Hunch would never have unveiled the demographic tendencies which are among the most pressing problems of our day; the conduct of modern financial policy involves much more than traditional wisdom. Neither the net reproduction rate nor the net national income at factor cost is a concept which could have been elaborated without systematic study and research."

Even where the importance of this kind of knowledge is recognised, it is doubtful whether there is a parallel recognition of the importance of providing the resources which make it possible. "Here, at any rate, the universities are under-staffed and under-endowed; the idea that provision for research in these fields by way of libraries, calculating machines, computors, and research assistants, is as important as provision for laboratories and experimental stations seems still to present an appearance of novelty and paradox." The number of universities in which there is continuous provision for research in social questions is still extremely small. Yet the prospects of tangible return in national welfare are at least as great in the social as in the natural sciences. With the national income running at its present rate, the discovery of knowledge which made possible the reduction of the average of unemployment by as little as 0·5% would mean a gain of at least £40,000,000 per annum.

While the increase of facilities for independent research must always be a prime objective, much of the collection of material necessary for the establishment of correct views on social and economic questions can only be satisfactorily performed by Governments. "It would be futile for universities to attempt to carry out a census." In the nineteenth century British official statistics led the world, but in the twentieth century their comparative performance has not always been so good. The blame must rest squarely upon Governments and the public who have failed to recognise the importance of progressive improvements of methods and the great unwisdom of cheese-paring financial measures. In the last few years, however, the exigencies of war and a gradual enlargement of views as to what is essential as a basis for running the complex machinery of a modern State have brought about changes, both in the machinery for collecting information of this sort and in the provision of organs for its systematic survey, and the committee is satisfied that, unless present arrangements and plans are upset in some future economy campaign, the provision for research within the governmental machine is much more likely to be hampered by the lack of availability of properly trained staff than by the lack of realisation of the importance of the work to be done. To prevent overlapping, and also to ensure that the material available is exploited from every point of view, the committee would like to see an Interdepartmental Committee charged with the duty of bringing to the notice of departments the potential value for research purposes of the material which they collect and suggesting new methods and areas of collection.

---

[1] Report of the Committee on the Provision for Social and Economic Research. (Chairman: the late Sir John Clapham.) Cmd. 6868. H.M. Stationery Office. Pp. 15. 3d.

Outside the governmental machine the existing provision for research is not sufficient as regards (*a*) staff, and (*b*) resources to enable what staff there is efficiently to pursue its researches. The committee found that in the universities and university colleges of Great Britain there were some 52 professors and readers in the social sciences, whereas in pure science there were 296 and in medicine 176. Excluding certain outlays by Oxford and Cambridge, in round thousands some £116,000 was spent on provision for the social sciences, as compared to £987,000 for pure science and £886,000 for medicine. To the private enterprise of various scientific and educational foundations we owe what provision exists already for organised research institutes or divisions, and the committee remarks :

> " We believe that the great foundations which have brought succour to the social sciences in this country have been administered with vision and imagination. . . . Nevertheless we cannot regard as satisfactory a state of affairs in which important branches of knowledge receive little or no routine allocation for, as it were, laboratory expenses, but are permitted by their universities occasionally to pick up what they can by appeals to outside foundations, some of which draw their funds from sources abroad."

Two things are therefore necessary :

> " First, there should be an increased provision of resources ; secondly, the increase should be *on a permanent and routine basis*. The universities, being placed in possession of more funds, must come to see, not only that more chairs, readerships and lectureships are desirable in respect of the social sciences, but also that the holders of these posts should be as entitled to the necessary equipment and assistance for carrying out researches in their field as the holders of posts in the natural sciences are in theirs."

On the question of finance the committee thinks that, while the universities should spontaneously initiate developments, the University Grants Committee should take it as part of its duty to survey systematically the range of work in this field undertaken by the several universities, and, if gaps are revealed, to offer such stimulus as may be necessary to secure that they are filled. " That is to say, that, just as in relation to medical education and research the University Grants Committee has reinforced itself by a special medical advisory subcommittee, it should do the same, so soon as is practicable, in relation to the social sciences. This plan involves no interference with either the initiative or the autonomy of the universities."

The committee turns down, for the present, the proposal that there should be established an official Social Science Research Department or Council parallel with the Department of Scientific and Industrial Research, or the Medical Research Council, which should distribute grants and coördinate research activities.

> " The chief need of the social sciences at the present time is the strengthening of staff and provision for *routine* research. The existing research councils have never assisted research carried out as a normal routine function, nor are they suited to do so. Moreover the social sciences, although rich in promise, have not yet reached the stage at which such an official body could be brought into operation without danger of a premature crystallization of spurious orthodoxies. Their scope is as yet too ill-defined and the output too inadequate for a formal coördinating body to be appropriate. Yet another reason which has influenced us is that, the whole field being understaffed, we do not wish to see the best men—only the best would be of any use for such difficult work—diverted from doing research to coördinating research. . . . What is needed at this stage is more work at the universities."

The committee is convinced that its own suggestions—the mixed interdepartmental committee to advise upon research within the machinery of government, and the subcommittee of the University Grants Committee to advise and foster development within the universities—are " likely to obtain far more general support than any attempt at this stage prematurely to imitate the official research departments and councils of the natural sciences."

THE WORLD HEALTH CONFERENCE

FROM OUR SPECIAL CORRESPONDENT IN NEW YORK

THE conference, having been at work continuously for a month, is now within sight of the end, and the tired delegates can soon expect deliverance from the heat and humidity of New York City.

When signed, the protocols will set up an Interim Commission, which will take over UNRRA and the Office International d'Hygiène Publique, and which will in turn give place to a permanent World Health Organisation.

Membership of the W.H.O. will differ sharply from that of the United Nations. Members of the U.N. may join the W.H.O. by signing the new constitution. States whose governments have been invited to send observers to the present conferences—e.g., Siam, Eire, Austria, and Sweden—may join by the same procedure of signing. Countries, such as Spain, which have not been invited to send observers may attain a state of grace when their applications have been approved by a two-thirds vote of the World Health Assembly. Territories or groups of territories which are not responsible for the conduct of their international relations may be admitted as associate members. It is probable that associate members will have neither the right to vote nor the right to hold office.

The work of the W.H.O. will be carried out by the World Health Assembly, the executive board, and the secretariat, the last of these including the director-general and the administrative and technical staff. In the World Health Assembly each member State will have one vote, although three delegates may be sent by any State and there is no limit to the number of alternates and advisers allowed. Meetings must be held at least once a year. The assembly determines policies, appoints the director-general, and adopts international agreements. The detailed procedure of ratification has not yet been settled completely. The assembly has the authority to adopt regulations concerning sanitary and quarantine requirements, standard nomenclature of diseases, pharmacopœias, and the advertising of drugs which pass in international commerce. Both in the question of " contracting out " of regulations and of voting in the assembly—now to be by two-thirds in important questions and by simple majority in others—the Russian delegation showed an accommodating attitude in adopting a view contrary to the opinions they originally expressed. The assembly also has the power to promote and conduct research, in its own institutions or in coöperation with institutions of members.

The executive board will consist of 18 members, each of whom will serve for three years. The board is the executive organ. It will advise the assembly on questions referred by that body. It will submit plans and programmes of work, as well as agenda for meetings.

The director-general is appointed by the assembly on nomination of the board. He is the chief technical and administrative officer of the W.H.O., and is ex-officio secretary of the assembly, the board, and all committees and conferences. The director-general appoints the staff of the secretariat and prepares the budget.

From time to time the assembly will define the areas in which it desires to establish a regional organisation. These regional entities will be integral parts of the W.H.O. Each will consist of a regional committee of members and associate members and a regional office headed by a regional director. The Pan-American Sanitary Bureau and the Pan-American Sanitary Conference will be integrated with the W.H.O.

Each member must report annually on the action taken and progress achieved in public health and on important public-health laws and regulations. Each member must also provide statistical and epidemiological reports in a manner to be determined by the organisation.

Such is the skeleton of the new animal. Its viability must await the test of time, but confident predictions are being uttered by its accoucheurs.

Letters to the Editor

INTERIM

SIR,—Medical officers who have just been released from the Services where they had been trained, or were training, as specialists are finding difficulty in obtaining work in civilian life for which they are fitted, and their predicament has been causing us much concern. We are impressed not only by the individual hardship involved but also by the fact that these men may be driven to abandon their plans for specialisation at a time when there is a great dearth of specialists in every branch of medicine and surgery. In this fashion a reservoir of most useful recruits for the consultant service of the future will be lost.

The men concerned fall into two groups.

Group I consists of about 800 men who were being trained as consultants, and have perhaps acted as graded specialists. They are about 28–33 years old, and they have either taken or are preparing for higher qualifications. They are now acting as registrars at teaching or other hospitals where they are paid £550 plus £100 for maintenance. We propose that their term of office should be extended, if they so desire, until the Bill comes into operation, provided that the postgraduate deans who selected them are satisfied with their work.

Group II is an older group of men who have been qualified perhaps for ten years or more, and some of whom are nearly forty years of age. Nearly all of them have consultant qualifications. We ask the Ministry of Health to create for these men a number of more senior salaried whole-time appointments. Since their appointments will occupy all their time, these men will not compete for private practice with the other unpaid assistant physicians and surgeons on the staff of the hospital. Hospitals would be asked how many posts of this kind they need, and the appointments would be made by a small committee in each region. The term of office would end when the new service begins.

We believe that these proposals should in some measure mitigate the uncertainties of the present time, while the country would surely gain.

MORAN
President, Royal College of Physicians.
ALFRED WEBB-JOHNSON
President, Royal College of Surgeons.
EARDLEY HOLLAND
President, Royal College of Obstetricians and Gynæcologists.

TEACHING IN CHILD HEALTH

SIR,—Your leading article of July 6 summarises the Edinburgh plan of teaching the problems of health in infants and children (as distinct from those of disease). As this particular kind of pædiatric teaching is being considered at present both by the medical schools and the General Medical Council, its public discussion in THE LANCET is valuable, and I am grateful to you for bringing it into general notice.

Will you allow me to make some comments upon what you have said and add some further explanations of the Edinburgh plan? This plan is the fruit of twenty years' clinical experience of the newborn and of an associated child-welfare clinic. The programme of teaching is designed for the needs of what you call "the potential general practitioner": it is based on the fact that it is in the home that the issue of child health and disease is decided, and on the firm conviction that the family doctor, *working in the home*, can control this issue better than any other medical person, and that he wishes to do this.

The plan is as follows. After some systematic lectures, a class of students enters upon the clinical course of child health. This consists in eighteen meetings: eight given in the care of the newborn and in neonatal diseases; ten in the problems of the older infant and child; and all at the maternity hospital. There is a definite programme of instruction, and a regular sequence of subjects. There is a basal training concentrated upon a uniform method of clinical assessment of health (physical and mental) in the successive ages of childhood, the principles and application of infant and child dietetics, and the instruction of the mother in the care and the physical and mental education of her child. The detection and treatment of minor ailments is included but is only accessory to the main theme. All teachers taking part present these basal principles and techniques in the same way.

Your criticism of the large number of students (70) is a little misleading. The total class is always subdivided. The basal techniques are demonstrated in a small lecture-theatre on selected typical cases and material to half the class (30–35). Thus of the ten meetings devoted to the older infant and young child, six are devoted to these basal clinical demonstrations. Children of school-age are included. (The fact that they are not examined *in a school* is not material; because the health of the school-child is determined in his home, and can be assessed and controlled there by his family doctor.) The remaining four meetings are given in the sessions of the hospital child-welfare clinic to small groups of 10 students gathered closely round mother, child, and doctor.

In this way the future family doctor gets in one place a clinical introduction to the whole range of health problems from birth throughout childhood; and is tested in his proficiency in a professional examination. And at the same time he receives his clinical training in diseases of children and in obstetrics.

The advantages of this central health clinic for the training of the teacher and for study and research are equally great, indeed greater. Only in such a central clinic can we build up a complete training-school for all those whose lifework is to be devoted to the care of children—pædiatricians, medical officers of the municipal health services, health visitors, and midwives. And it is only at a maternity hospital, with the newborn providing the link with natal and antenatal pædiatrics, that we can get the full range of the clinical material of health in pædiatrics, and a progressive continuity of observation, record, and study from both onwards throughout childhood.

University of Edinburgh.   CHARLES MCNEIL.

POLYARTERITIS NODOSA AND SYPHILIS

SIR,—The excellent article by Miller and Nelson[1] on polyarteritis nodosa developing during antisyphilitic treatment reminded us of a somewhat similar case which came under our care in 1942. Unfortunately we have no access to the detailed notes of this case, especially to the record of the antisyphilitic treatment he received.

In March, 1942, a soldier, aged 39, developed a chancre. He started regular treatment with bismuth and neoarsphenamine on the 19th. Before this he had had no arsenical treatment. His past history was irrelevant. Early in July he developed a mild transient jaundice, with aching pains in his muscles and joints, and on July 18 he noted that his knees were swollen. Subsequently his legs and ankles also became œdematous. Bismuth was not administered after July 18, nor neoarsphenamine after the 11th, by which time he had been given 4·2 g. of bismuth and 10 g. of neoarsphenamine.

At the beginning of August, 1942, he started to have transient but recurrent generalised colicky abdominal pains, and on several occasions he vomited a bile-stained fluid. He was admitted to hospital on Aug. 18, by which time the swelling of his legs had decreased considerably. The abdominal colic ceased after two weeks. On admission a blood-count showed red cells 3,300,000 per c.mm., Hb 68%, and white cells 20,100 per c.mm. (polymorphs 69%, eosinophils 9%). His urine was normal. By the 31st his Hb had increased to 96% and the leucocytes had fallen to 12,500 per c.mm. (polymorphs 86%, eosinophils 3%). On the 30th his right foot suddenly went numb and became paralysed, and his right ankle again became œdematous. On Sept. 10 his right hand became numb and his left hand was similarly affected a few days later. A lumbar puncture at that time revealed cerebrospinal fluid (C.S.F.) under normal pressure and containing total protein 60 mg. per 100 c.cm. and 18 polymorphs per c.mm. The Wassermann reaction in the C.S.F. was negative.

This patient came under our care on Sept. 15, 1942, when he was a pale, thin, ill-looking man, sweating profusely. He had a remittent fever of 99°–101° F, with tachycardia of 90–130 per min. His blood-pressure was 135/90 mm. Hg. No abnormal physical signs were found in his chest or abdomen except a palpable and tender liver margin. His legs showed considerable pitting œdema over both ankles, with wasting of the muscles below the knees.

---

1. Miller, H. G., Nelson, M. G. *Lancet*, 1945, ii, 200.

There was complete paralysis below the right knee, and paralysis of the left plantar flexors, the extensors of the left foot and toes being considerably affected also. The muscles involved were not painful or tender. There was slight impairment of sensation to light touch and pinprick over the distal third of the legs and feet with a fading upper border, and considerable impairment of position sense in the toes. Vibration sense was absent below the middle of the right leg, though it was practically normal on the left side. No localised wasting or weakness of his arms was found, though there was slight impairment of sensation to pinprick over the distal parts of the forearms and hands. His nervous system was otherwise normal.

Urine was normal, and blood-urea was 32·5 mg. per 100 c.cm. Blood-count: Hb 82%, red cells 4,500,000 per c.mm., white cells 10,400 per c.mm. (polymorphs 78%, no eosinophils). Blood Wassermann reaction negative; Lange reaction normal.

Eight days later he complained of weakness of the left hand, when he was found to have developed considerable weakness in his finger flexors; but, apart from some loss in position sense in the right middle finger, no further alteration in sensation was found. By the end of September the œdema of the legs had disappeared. Urine was still normal. Blood sedimentation-rate 45 mm. in an hour. White-cell count: 10,000 cells per c.mm. (polymorphs 86%, eosinophils 1%).

Treatment with sodium thiosulphate, full vitamin therapy, and a course of sulphathiazole had no effect on his general or local state. Subsequently his condition gradually deteriorated, his fever persisted at the same level, he rapidly lost weight and appetite, and developed transient attacks of dyspnœa. His blood-pressure rose steadily to about 170/130 mm. Hg. His neurological signs persisted and became intensified: latterly he was completely paralysed below both knees and in both hands. The sensory loss became greater, leading to several small cigarette burns of the fingers. He became mentally confused and incontinent of urine at night. On Oct. 17 albuminuria was noted for the first time, though no other evidence of renal involvement was found, and at the end of October his blood-urea was still normal (38 mg. per 100 c.cm.). He died in coma on Nov. 20, 1942.

The *diagnosis of polyarteritis nodosa was seriously entertained* throughout the last six weeks of his illness, and necropsy amply confirmed this supposition, typical changes being found in the arterioles and smaller arteries of the mesentery, liver, stomach, kidneys, heart, lungs, &c. In the lungs the changes were confined to the bronchial vessels, the pulmonary radicles being unaffected.

This case is in many points similar to that described by Miller and Nelson, not only in the fully developed stage but also in the premonitory stages, when various reactions developed which might well have been due to hypersensitivity, innate or acquired, to the antisyphilitic arsenical preparations exhibited at that time.

J. W. ALDREN TURNER.
London. J. H. PATERSON.

RADIOLOGY IN GENERAL PRACTICE

SIR,—I have received a remarkable circular letter from a radiologist. The following are some of its more striking sections:

"In January and again in February I wrote to you and some 400 other doctors in this area notifying you that I had resumed radiological practice in this district. Excluding those doctors who were sending me work before the war the total fees produced by the two circular letters in the first four months of this year amount to four guineas. I have recently been appointed assistant radiologist at X . . . but this together with the small amount of private work at Y . . . brings in less than five pounds per week.

"It is not surprising that I am suffering from my full share of ex-Serviceman's disillusionment. I was reconciled to the loss of my pre-war general practice when I decided to invest my scanty savings in a complete X-ray installation, but I assumed that I should have no difficulty in making ends meet after the first few weeks. I appeal to you for the third and last time to send me an occasional case, as if this letter produces no better response than the previous ones I must abandon my attempt, sell my apparatus and seek a full-time appointment. . . ."

This circular forms a refreshing contrast with the recent attempts by many of the more vocal members of the profession to depict private practice as a kind of private paradise which must be defended at all costs against the serpent in the guise of Mr. Aneurin Bevan.

It is true that there are some commercially successful private radiologists, but in general the financial structure of private medical practice cannot carry the heavy overheads which are unavoidable in such branches of medicine as radiology. Paying their doctor's fee taxes the resources of the ordinary private patient to the utmost without the addition of costly radiological investigations. The general practitioner will no doubt turn increasingly to radiology as an aid to diagnosis, the more so because many have had free access to radiological opinion in the Forces. The present method whereby the ordinary doctor can only get an X ray done second-hand through a consultant, except for the few private patients who are rich enough to pay, is clearly unsatisfactory. The solution, as the circular letter suggests, is full-time appointments for radiologists instead of their having to waste valuable time touting for private patients. All the larger health centres should be equipped with an X-ray department as soon as practicable. The problem then will be to find radiologists rather than to find employment for them.

BRIAN H. KIRMAN.

DEMOCRATIC NURSING

SIR,—Mr. Sol. M. Cohen's timely article strikes at the roots of the whole problem of the future of our health services. Whatever we may think of the details of the Health Bill, of its inadequacies or compromises, no real development of the hospitals is possible unless we succeed in recruiting the necessary nursing and domestic staff. This cannot be done until we can offer wages and conditions of work that can compete with the counter-attractions of industry. We need men and women in the hospitals capable of responsibility and enthusiasm. We shall not get them without decent wages and working conditions. These must include a revision of the status and prospects of all hospital employees. The R.A.M.C. has produced hundreds of skilled men who would welcome the opportunity to carry on this work. Some of those who have tried to do so are leaving the hospitals in disgust and returning to industry. This is not only on account of low wages and long hours but owing to the off-hand way they are sometimes treated by autocratic members of the administrative nursing staff.

It is not enough, however, for doctors and matrons to change their attitude. The standing of workers in many industries that was achieved during the 1914–18 war has improved during this war in a more positive way through the Joint Production Committees. There is more to be considered than just the question of happiness referred to by Mr. Cohen: advance depends on a live trade-union movement and the activities of the shop-stewards on the job.

Hospital staff conditions will never be such as to encourage recruitment in the way we need until the hospital staff trade-union movement attains an influence comparable to the importance of the job to be done. And this will not happen without the interest and support of an educated public opinion. The solution of the nursing problem is only possible along the lines of increasing democracy and humanisation within the hospitals. Mr. Cohen has dealt with the human aspects, he leaves the question of democracy to be worked out by others. That way and that way alone lies progress.

London, W.3. RUSCOE CLARKE.

SHORTAGE OF NURSES

SIR,—There are many hospitals acutely short of nurses at present. With the reshuffle that has taken place with the gradual winding up of the Emergency Medical Services, the lack of nursing staff has resulted in the partial, or almost complete, closure of many wards. The experience of one such hospital is doubtless typical of many.

A particular emergency hospital knew on a certain date that two-thirds of its nursing personnel would be withdrawn. Some months before this was due to happen preliminary efforts were made to attempt to bridge the gap. The local authority was therefore asked to seek recognition of the hospital as a training school for nurses. It was pointed out that the emergency accommodation and amenities, while adequate for war conditions, must be improved to meet the standards laid down by the General Nursing Council. Certain plans were, therefore, drawn up, and in due course an inspection of the hospital was carried out by representatives of the General Nursing Council in the hope that recognition as a training school would be forthcoming. It is now three months since this inspection was made and the hospital has been reduced to little more than a nucleus. In the meantime the keenness and patience of the senior nursing staff, who are only too anxious to begin training, are wearing thin. Is it to be wondered that your note, in which the Minister of Health tells us that he is troubled by the lack of nurses and wishes to encourage the establishment of more training schools, adds to their feelings of frustration?

Is the General Nursing Council so inundated with applications for recognition that a decision from them takes as long, or longer, to obtain, than a decision from a Government department? Do those persons, either in local authorities, Government departments, or statutory bodies, such as the G.N.C., who are interested in hospital organisation, realise that they themselves, by procrastination, are stultifying the efforts of the good people trying to work in hospitals, who wish to get on with the job? It is still true that hope deferred maketh the heart sick.

PROTESTANT.

THE LONDON COLLEGE OF OSTEOPATHY

SIR,—I was greatly surprised to see in your issue of July 13 an advertisement inserted by the above college stating that it intended to teach osteopathy to registered medical practitioners.

Not so long ago the medical profession, with the help of the British Medical Association, very rightly fought and prevented the official recognition of osteopathy in England, on the grounds that fundamentally the basic principles were wrong and the teaching by the then existing college was inadequate. Presumably the osteopaths have put their house in order and now, at this time of unrest in medicine through the return of practitioners from the Forces and its transition into State medicine, hope to coax practitioners to take a nine months' course, for which a diploma may be given.

The erroneous basic principles of osteopathy are still there and surely it was a grave mistake that such an advertisement was allowed to appear in the columns of a medical journal.

There are several excellent books on manipulation by British authors. The benefits obtained in certain conditions by gentle manipulations without anæsthesia, or the more forcible ones with anæsthesia, are well known and practised now by many orthopædic surgeons and physiotherapists throughout the country.

It would appear that the British Osteopathic Association at this stage hope to gain official recognition by teaching and bringing into their ranks registered medical men. I consider it most important that the medical profession should at this time dissociate itself from this association.

London, W.1. W. E. TUCKER.

*** While sharing in general our correspondent's opinion of osteopathy, we accepted the advertisement for the following reasons. (1) A newspaper exists to provide information rather than suppress it, and the proposal of the London College of Osteopathy to run a nine months' course confined to registered medical practitioners should be known to the profession. (2) Practitioners who have completed their medical training and obtained a registrable qualification are entitled to choose for themselves whether they will adopt osteopathic, homœopathic, or any other methods of treatment. (3) The advertisement came from a registered practitioner, who is dean of the London College of Osteopathy, and was addressed specifically to readers who are registered practitioners and may therefore be supposed capable of forming their own opinions. (4) The profession is often accused of unwillingness to listen to ideas originating outside its own ranks. Refusal to announce the proposed course would have given colour to this accusation.—ED. L.

Obituary

ERNEST KAYE LE FLEMING

KT., M.A., M.B. CAMB., HON. M.D. DUBL. AND MELB., F.S.A.

ONLY a few weeks ago Sir Kaye Le Fleming's many friends in London were congratulating him on his appearance of full recovery from his ill health of a year ago, and they were dismayed to hear of his death on July 16.

Lafayette

Born in 1872 at Tonbridge, and educated at Tonbridge School and Clare College, Cambridge, he studied medicine at St. George's Hospital, where, after qualifying in 1898, he filled the posts of house-physician, house-surgeon, and assistant surgical registrar. He showed his versatility by playing golf for his university against Oxford and by editing for a time his hospital's *Gazette*. In 1901 he settled in practice in Dorset where he quickly built up a large medical connexion. Soon, however, he began to make his influence felt farther afield. He was elected to the council of the British Medical Association, and his acumen and business capacity were so evident that in 1931 he was elected chairman of the association's representative body. After filling this post for three years he was elected chairman of the council, and fulfilled the onerous duties of the office with such distinction that in 1941 he was awarded the gold medal of the association. He acted as chairman of the B.M.A. Committee on Nutrition which in 1935 published a report that did much to instruct public opinion by calling attention to the need for an increase in the dietary of many undernourished people. In the following year he served in a similar capacity on the B.M.A. Committee on Physical Education, whose report helped to bring this neglected subject into prominence. His special knowledge led to his membership of the National Advisory Committee for Physical Fitness and of the Central Council for Physical Recreation. In 1932 he was given the honorary degree of M.D. by Dublin University and in 1935, when visiting Australia, received a similar honour in Melbourne. In 1937 he was knighted.

Le Fleming was tall and of fine bearing, of kindly disposition, cautious in judgment, measured in speech, equable in temperament, and wise in counsel. He won the respect of all those with whom he came in contact, and for many years he exerted great if unobtrusive influence. Though he did not write much, he put his valuable experience at the service of the profession in his *Introduction to Medical Practice*, published in 1936. He retired from the post of chairman of council of the B.M.A. in 1939 and thereafter the amount of his public work gradually diminished. To the last, however, he maintained his interest in public affairs and in his favourite hobby of antiquarian research. He married in 1901 and had two sons.

Infectious Disease in England and Wales

WEEK ENDED JULY 13

Notifications.—Smallpox, 0; scarlet fever, 845; whooping-cough, 2270; diphtheria, 277; paratyphoid, 17; typhoid, 6; measles (excluding rubella), 3981; pneumonia (primary or influenzal), 416; cerebrospinal fever, 33; poliomyelitis, 12; polio-encephalitis, 0; encephalitis lethargica, 5; dysentery, 61; puerperal pyrexia, 149; ophthalmia neonatorum, 69. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 2 (0) from enteric fever, 2 (0) from measles, 12 (2) from whooping-cough, 2 (0) from diphtheria, 39 (4) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 215 (corresponding to a rate of 25 per thousand total births), including 18 in London.

Public Health

The Tuberculous in Birmingham

THERE are some 5000 known cases of lung tuberculosis at large in the community of Birmingham, and about half of these are capable of infecting other people. The public-health committee of the city, who give these figures in a recent report,[1] have proposed plans for developing the tuberculosis service, and for providing reablement, employment, and housing for the tuberculous. The hospital surveyors reporting on behalf of the Ministry of Health in 1945 said that developments in Birmingham had been piecemeal, patients being treated in four tuberculosis hospitals and sanatoria. This has led, the surveyors thought, to extravagance in staffing and undesirable economies in equipment—three of the sanatoria lacked X-ray plants—and they suggested that these institutions should be replaced by one large sanatorium. The public-health committee believe there are valid arguments against such a plan. In a single institution of 1656 beds—the number judged to be needed—the medical superintendent could not know each convalescent patient as he should. They feel it would be better to have one central relatively large institution for preliminary observation and treatment, whence patients could be sent to smaller sanatoria for convalescence.

At present only 811 beds are available, so the plan contemplates a service more than twice the existing size. The Yardley Green Road Sanatorium is to be enlarged to form the central admission centre and treatment hospital, from which women patients will go to Romsley Hill Sanatorium and men to West Heath. Children are to be admitted direct to a much enlarged sanatorium at Salterley Grange, which would receive cases of all types. Yardley Green is near the centre of the city, but the other advantages of the site are thought to outweigh this disadvantage, climatic conditions being favourable and the hospital easily accessible to patients and friends; moreover the span of treatment in this central institution is expected to be short, patients soon being transferred to the cleaner air of the outlying sanatoria. It is somewhat disappointing to learn that the committee have rejected the recommendation of the hospital surveyors that this central institution "should be closely linked with the University Thoracic Unit," in so far as that would imply that the thoracic unit at the sanatorium should be closed down; though so far as staff and professional coöperation are concerned there would be the closest linkage. Chest operations, the committee consider, must be regarded merely as an incident in treatment, and it would not be in a patient's interests to send him for treatment to "a clinic not concerned with his tuberculous condition as such, but merely as a subject for special surgery." They therefore propose to continue and extend the thoracic surgery unit at Yardley Green Road.

Both the outlying sanatoria are to develop reablement. At Romsley Hill there will be workshops for 100 patients, and at West Heath workshops for 150. Diversional therapy will begin at Yardley Green Road, and at the outlying sanatoria vocational therapy will succeed it as soon as the patient is well enough. Workshops properly equipped and staffed will fit the patient either for his return to his own work or for the work which he will finally be able to undertake. In addition, the Disabled Persons Corporation Ltd., established under the 1944 Act, is to set up a factory where tuberculous people can be employed under sheltered conditions. Some will live at home and work at the factory, while others will live at hostels in Yardley Green Road Sanatorium. The committee also hope to gain the help of the estates committee in considering arrangements for housing appropriate tuberculous patients who live at home.

The whole programme, though it may appear ambitious, does not go beyond the needs of the city if tuberculosis is to be brought under control; and the committee rightly pay tribute to Dr. Geddes, the chief clinical tuberculosis officer, on whose thorough and painstaking review their recommendations are based.

---

1. Report of the Public Health and Maternity and Child Welfare Committee to the City Council of Birmingham, June 4, 1946.

Notes and News

WORLD FEDERATION OF SCIENTISTS

A TWO-DAY international conference, attended by delegates and observers from 14 countries and 18 organisations, was opened in London on July 20, to found an international federation of scientific workers. The objects of the federation, in whose foundation the British Association has taken the initiative, include the fullest utilisation of science for promoting peace and human welfare; the application of science to the solution of urgent problems, such as the peaceful use of atomic energy and the rehabilitation of devastated countries, and to the problems of undeveloped and colonial countries; the promotion of international coöperation in science and technology; and the exchange of scientific workers and knowledge. Prof. Joliot-Curie (Paris) was elected president; Academician N. N. Semenov (Moscow) and Prof. J. D. Bernal, F.R.S. (London), vice-presidents; and Mr. Harlow Shapley, PH.D. (United States), treasurer.

MEMORIAL TO NURSES AND MIDWIVES

MORE than £17,000 has already been raised towards the memorial fund instituted seven months ago (*Lancet*, Jan. 12, p. 75) for the nurses and midwives who fell in the war. The first object of the fund, whose patron is the Queen, is to furnish a chapel in Westminster Abbey to house the roll of honour of those who have fallen. Gifts in excess of the sum required for this purpose (about £5000) will be used to form a fund to benefit the nurses and midwives of the Empire and Commonwealth. The hon. secretary is Miss J. Elise Gordon, editor of the *Nursing Mirror*, which is paying all administrative expenses; and the address is Dorset House, Stamford Street, London, S.E.1.

BRITISH-SWISS MEDICAL CONFERENCE

THE speakers at the conference to be held in Basle on Sept. 16–21 have now been announced. The British speakers will include: Sir Hugh Cairns, neurosurgery; Dr. E. A. Carmichael, man in relation to his environment (heat and cold); Prof. E. C. Dodds, F.R.S., synthetic œstrogens in relation to cancer; Dr. N. Hamilton Fairley, F.R.S., tropical diseases with special reference to the prevention of malaria and typhus; Prof. A. C. Frazer, normal and defective fat absorption in man; Dr. Donald Hunter, industrial medicine; Prof. R. A. McCance, nutritional problems; Dr. John McMichael, circulatory problems; Mr. J. J. Mason Brown, arterial surgery; Dr. J. S. Mitchell, experimental radiology; Dr. R. R. Race, the rhesus factor; Sir Reginald Watson-Jones, surgical rehabilitation; and Prof. F. G. Young, D.SC., experimental diabetes. Among the Swiss speakers will be: Prof. E. Grasset, primitive tuberculosis, primary infection and "premunition"; Prof. L. Rüedi, acoustic trauma, its origin and prevention; Prof. R. Meier, specificity and differentiation of sympathicotropic drug action; Dr. J. E. Wolf, combined climatic and surgical treatment of the lungs; Prof. H. Mooser, twenty years of research in typhus; Prof. A. Fleisch, nutrition in Switzerland during the war; Prof. A. Vannotti, adaptation of tissue respiration to effort and altitude; Prof. H. Krayenbühl, immediate and ultimate results of carotid ligation in intracranial aneurysms; Prof. F. Verzar, muscular efficiency; and Prof. H. Rossier, cardiac localisations of thrombo-angiitis obliterans. Further information may be obtained from the Royal Society of Medicine, 1, Wimpole Street, London, W.1.

CONCESSIONS TO NURSING ORDERLIES

LIKE the General Nursing Council for England and Wales, the General Nursing Council for Scotland has now agreed that ex-Service men and women with first-class qualifications as nursing orderlies shall be allowed to sit for the State examination after an intensive course lasting a year, and the Department of Health for Scotland is arranging courses at two hospitals. Students granted this concession must have had the same experience as those seeking it in England—namely, two years' experience of nursing in a Service hospital under a State-registered nurse, and one of the following Forces qualifications:

Nursing orderly, class I, or nursing member, class I (Army).
Leading sick berth attendant (Navy).
Leading aircraftman or aircraftwoman in the trade of nursing orderly (Royal Air Force).

Men and women who have had two years' experience of the kind but do not hold one of these qualifications are eligible for six months' remission of the three-year course for State registration, or can be enrolled immediately, without further training, as assistant nurses.

Scottish courses begin in October at Law Junction Hospital, near Wishaw, and Stracathro Hospital, near Brechin. Temporary nursing work until the beginning of the course will be found for those who want it. Men and women still in the Forces should apply through Service channels; those who are already demobilised should get an application form from the Department of Health for Scotland (Nursing Branch), St. Andrew's House, Edinburgh.

IMMUNISATION AGAINST DIPHTHERIA

THE Ministry of Health announces that the number of children immunised against diphtheria last year under the local authorities' scheme was 613,329—an increase of 52,015 on the total for 1944. The number immunised since the national campaign was launched five years ago was 5,979,284.

There were 720 deaths from diphtheria last year, and 25,223 cases. These are the lowest figures ever recorded. In every year since the campaign got under way, a new low record has been established. Deaths last year were only a quarter of the pre-war average, and the total number of cases less than half. The decline is in striking contrast to the increase in some other European countries where diphtheria epidemics have been the worst for fifty years.

The aim of the present summer campaign is to secure the immunisation of at least 550,000 babies before the winter epidemic season starts. It is believed that if the great majority of babies born each year were protected just before their first birthday, diphtheria would be eliminated in this country as an epidemic disease. Last year 474,809 children under five years of age were immunised, compared with 386,237 in 1944: but in England and Wales as a whole, four out of ten children are still unprotected.

Mass immunisation is now carried out in all big cities of Canada and the United States. Deaths from diphtheria per 100,000 children in Toronto fell from 15·7 a year in 1926–27 to 0·61 in 1933–36 and 0·3 in 1940–44. In New York, where diphtheria deaths averaged 1290 annually from 1910 to 1919, the 1939 figure was 22, the 1940 figure was 10, and the 1944 figure was 6.

A BUREAU OF SCIENTIFIC INFORMATION

THE Royal Society's Empire Scientific Conference warmly supported a proposal that a bureau for scientific information should be set up under the direction of the British Association. This will be at the disposal not only of scientists but also of the press, broadcasting, television, the films, and other publicising agents. It is intended that the bureau should keep records of all scientific research and answer questions or put inquirers into touch with scientists who can provide authoritative answers; it will also circulate official information about new developments. The bureau will serve to protect scientists from being inveigled into giving unconsidered accounts of their discoveries to reporters not qualified to handle them. The cost will be met partly from public funds.

CAR FOR THE DISABLED

THE "Larmar," a new single-seater car of unusual design, is now in production. Powered by a 2½ H.P. engine fitted at the rear, it cruises at 35 M.P.H., and has a petrol consumption of about 65 M.P.G. Priority of supply is to be given to the war-disabled, for whose needs the construction is adapted; the controls are placed in the usual positions, but the clutch, brake, and throttle can be arranged for either foot or hand. The net price is £198; the purchase-tax has not yet been decided, and the question of omitting this tax when the purchaser is disabled is still under consideration. The concessionaires are Larmar Cars, Odeon Parade, High Road, North Finchley, London, N.12.

University of Cambridge

The Rockefeller Foundation has made a grant of £11,000 for training and research in the psychological laboratory during the next five years.

University of Manchester

The following were successful at recent examinations:

M.D.—F. H. Bentley (with commendation), William Fielding, Frank Fletcher (gold medal), and Dennis Shute.

University of Dublin

On July 3, at Trinity College, the degree of Litt.D. (stip. cond.) was conferred on Mr. J. Johnston Abraham, F.R.C.S., senior surgeon to the London Lock Hospital, author of *The Surgeon's Log* and *Lettsom, His Life and Times*, and other works.

Queen's University, Belfast

On July 10, the honorary degree of D.SC. was conferred on Sir Alexander Fleming, F.R.S., and the honorary degree of M.D. on Dr. Frederick William Price. Dr. Price has established an annual lectureship at the university, and the first lecture, delivered on May 9 by Dr. Gordon Holmes, F.R.S., on the Evolution of Clinical Medicine as Illustrated by the History of Epilepsy, appeared in the *British Medical Journal* of July 6.

Royal College of Surgeons of England

The following lectures will be delivered at 5 P.M. during October and November. Oct. 21, Prof. Harry Platt: localised cystic lesions of bone. Oct. 22, Mr. Geoffrey Keynes: surgery of the anterior mediastinum. Oct. 23, Mr. A. C. Palmer: ætiology, symptoms, and treatment of procidentia. Oct. 24, Mr. W. B. Gabriel: causation and treatment of anal incontinence. Oct. 25, Mr. R. C. Brock: surgery of lung abscess. Oct. 28, Mr. R. J. McNeill Love: surgery of the gall-bladder and common bile-duct. Oct. 29, Mr. A. E. Porritt: value of penicillin in surgery. Oct. 31, Prof. Geoffrey Jefferson: surgery of intracranial aneurysms. Nov. 1, Prof. C. A. Pannett: pancreatic surgery. Nov. 4, Mr. Terence Millin: surgery of the prostate. Nov. 5, Mr. J. B. Hunter: surgical treatment of pulmonary tuberculosis. Nov. 6, Prof. R. St. Leger Brockman: intestinal obstruction.

Westminster Hospital Medical School

The inaugural address of the new academic session will be delivered by Lord Woolton on Oct. 7, at 3 P.M.

Royal Institute of Public Health and Hygiene

On July 22 Sir Alexander Fleming, F.R.S., was presented with the Harben gold medal, a three-yearly award for "eminent services rendered to the public health"; and Dr. J. J. Buchan received the Smith award, which is conferred every third year on the medical officer of health recognised "as having done the most noteworthy work in the discharge of his official duties."

Bureau of Hygiene and Tropical Diseases

The Secretary of State for the Colonies has confirmed the appointment of Dr. Charles Wilcocks as director of this bureau and has appointed Dr. H. J. O'D. Burke-Gaffney, O.B.E., assistant director. Dr. J. F. Corson, O.B.E., who, since July, 1943, had given his help as acting assistant director, retired last month. The bureau is housed in the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1.

Medical Society for the Study of Venereal Diseases

The society's annual general meeting will be held at 11, Chandos Street, London, W.1, on Saturday, July 27, at 2.30 P.M. Dr. G. L. M. McElligott will deliver his presidential address on management and treatment of the late and latent syphilitic.

Philadelphia Award

The Alvarenga prize has this year been awarded by the College of Physicians of Philadelphia to Mr. William H. Feldman, D.SC., of the Mayo Foundation, in recognition of his work on chemotherapy in tuberculosis.

Blood-donors

Last year there were over 400,000 blood-donors on panels in England and Wales, excluding the south-west region, which was administered by the Army. Ministry of Health figures show that blood-donations numbered 393,677, of which 230,149 were taken by mobile teams. Many thousands of bottles of whole blood and plasma went to the fighting Services, and about 4000 bottles of dried plasma were sent to Holland after its liberation, for the treatment of people suffering from the effects of starvation. Blood-transfusion is being used more widely than ever before in civilian hospitals, particularly for surgical and maternity cases. It is estimated that 350,000 blood-donations will be needed during the present year, and more donors are to be recruited by local appeals. According to the annual report of the Scottish National Blood Transfusion Association, donor attendances fell from 57,000 in the year ending March 31, 1945, to 35,000 in the following year, with a concurrent rise in the demand by general hospitals for whole blood from 10,000 to 14,000 bottles and for plasma from 5500 to 6000 bottles. The effect has been to reduce the reserve of plasma built up during the war and to restrict its current production. "Considerably more organised recruitment and propaganda will be necessary," the report concludes, "if the association is to meet its commitments to the hospital services."

London County Council

Dr. Raymond H. Swindells, medical superintendent of New End Hospital since 1930, is retiring at the end of this month. The hospitals and medical services committee, recalling that he entered the service of the Fulham board of guardians in 1911, speak of the exceptional service rendered in the long career of this "most able and zealous officer." During the war of 1914–18 Dr. Swindells served in Gallipoli, Egypt, Palestine, and Syria.

A Reinstatement Case

The Folkestone Reinstatement Committee on July 12 awarded Dr. Albert Pearlman £400 compensation against the Folkestone corporation, by whom he was employed as a Civil Defence medical officer of health, at a salary of £400, from the outbreak of war until September, 1942, when he was called up. It was stated that on May 9 the War Office informed Major Pearlman that in view of the findings of a medical board he must relinquish his commission as from July 4. He was given 56 days' leave, and on May 27 applied for reinstatement in the position of part-time M.O.H. at a salary of £250. The Town Clerk, for the corporation, said that this was not an application for reinstatement but a reply to an advertisement in the public press for the office of part-time medical officer. The position was advertised, as required by the Ministry of Health, and had been filled with the approval of the Ministry. Dr. Pearlman's services had been satisfactory, and if there was a vacant position, when it was reasonable and practicable no doubt the corporation would consider Dr. Pearlman as an applicant. Mr. N. L. Taylor, for the appellant, said the position was one which the corporation had no power to make and the Ministry had no power to approve. The committee found that Dr. Pearlman's application satisfied the provisions of the Reinstatement Act; there had been default by the corporation in their discharge of their duties under the Act. It was not reasonable and practicable to order the employment of Dr. Pearlman in his former position, but they ordered the corporation to pay him £400 compensation for loss suffered or likely to be suffered through the corporation's default. Each party gave notice of appeal.

International Surgical Society

The next congress of this society will be held in London from Sept. 14 to 20, 1947. The president will be Dr. Leopold Mayer, of Brussels; the general secretary is Dr. L. Dejardin, also of Brussels. Local arrangements will be in the hands of a British committee, of which Prof. G. Grey Turner is chairman, and Mr. H. W. S. Wright, 9, Weymouth Street, Portland Place, W.1, is hon. secretary.

Provision of Nurseries

The London Women's Parliament and the National Society of Children's Nurseries are calling a joint conference on Sunday, July 28, at the Conway Hall, Red Lion Square, London, W.C.1. The speakers will include Dr. J. D. Kershaw, M.O.H. for Accrington. In the past fifteen months there has been a drop of 248 in the number of nurseries, and this conference is being called to discuss the need for a comprehensive nursery service as part of the recognised social services in the country.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. Richard Battle, M.B.E., F.R.C.S., Gorselands, Horsell Common, Woking, Surrey, and 148, Harley Street, W.1. (Tel.: Wel. 1207.)

Mr. Guy Blackburn, M.B.E., F.R.C.S., 51, Harley Street, W.1. (Tel.: Langham 3711.)

Dr. N. S. Plummer, F.R.C.P., 49, Harley Street, W.1.

Mr. F. J. Rutter, F.R.C.S.E., 3, Barnfield Crescent, Exeter.

Mr. Reginald S. Strang, F.R.C.S., 3, Westbourne Road, Edgbaston, Birmingham, 13.

Dr. C. O. Ungley, F.R.C.P., 13, Portland Terrace, Newcastle-upon-Tyne, 2.

In a leading article on Problem Families (June 22) we said that Pacifist Service Units are sponsored by the Society of Friends. We are informed that this is not so. Pacifist Service Units (whose address is 6, Endsleigh Street, London, W.C.1) is an independent organisation, drawing its members from all sections of the pacifist movement.—In a note on the new monthly journal, *Nutrition and Child Welfare*, on p. 58 of our issue of July 13, we mentioned with regret that *Maternity and Child Welfare* had come to an end in 1934. In fact it was incorporated, in October, 1934, with *Mother and Child*, the journal of the National Baby Welfare Council.

Appointments

Calvert, Mary, M.B. Belf.: M.O., Nigeria (Colonial Service).
Elbert, J. J., M.B.E., M.B. Glasg.: M.O., Nigeria (Colonial Service).
Galbraith, A. J., M.D. Edin.: deputy medical superintendent, Brighton Mental Hospital, Haywards Heath.
Smith, A. G., M.D. Glasg., F.R.C.S.: dermatological specialist medical referee for county-court districts of Beccles, Lowestoft, Norwich, Bury St. Edmunds, Ipswich, and other towns in the Eastern Counties.

Middlesex Hospital, London, W.1:
- Dinnick, O. P., M.B. Lond., D.A.: anæsthetist.
- Murray, C. J. B., M.S. Lond., F.R.C.S.: asst. surgeon.
- Newman, P. H., D.S.O., M.C., F.R.C.S.: asst. orthopædic surgeon.
- Willcox, Arthur, M.D. Camb., M.R.C.P.: asst. physician.

St. George's Hospital, London, S.W.1:
- Crawford, Theodore, M.D. Glasg., F.R.F.P.S.: director of pathology.
- Dow, J. F., M.B. Camb., M.R.C.P.: asst. physician.
- Hunter, M. I. A., M.D. Camb., M.R.C.P.: asst. physician.
- Siddons, A. M. H., M.CHIR. Camb., F.R.C.S.: asst. surgeon.
- Smith, Rodney, M.S. Lond., F.R.C.S.: asst. surgeon.
- Williams, Denis, M.D. Manc., F.R.C.P.: asst. neurologist.

Royal South Hants and Southampton Hospital:
- Eagar, F. J., L.R.C.P.I.: dermatologist.
- Langston, H. H., M.B. Lond., F.R.C.S.: orthopædic surgeon.
- Meller, H. K., M.B.E., M.B. Lond., M.R.C.P.: asst. physician.
- Richardson, L. A., M.B. Camb., F.R.C.S.: asst. surgeon.
- Robertson, K. M., M.D. Lond., M.R.C.P.: physician.
- Todd, P. G., M.D. Lond., M.R.C.P.: asst. physician.
- White, H. O., M.R.C.S.: asst. anæsthetist.
- Zorab, E. C., M.B. Lond., D.O.M.S.: ophthalmic surgeon.

Cardiff Royal Infirmary:
- Evans, Dillwyn, M.B. Wales, F.R.C.S.E.: surgeon in charge of fracture and orthopædic dept.
- Evans, R. Bryon, M.D. Lond., M.R.C.P.: asst. physician (general medicine).
- Hodgson, G. S., M.B.E., D.M. Oxfd: dermatologist.
- Mogg, R. A., M.B. Wales, F.R.C.S.: asst. surgeon (urology).
- Spillane, J. D., M.D. Wales, M.R.C.P.: asst. physician (neurology).
- Thomas, H. A., M.B. Wales, F.R.C.S.E.: asst. surgeon, E.N.T. dept.

Examining Surgeons under the Factories Act, 1937:
- Barber, C. H., D.S.O., D.M. Oxfd: Thame, Oxford.
- Braybrooke, M. K., M.R.C.S.: Tetbury, Gloucester.
- Brown, Alexander, M.B. Glasg.: Linton, Cambridge.
- Dalley, Gilbert, M.R.C.S.: Poole, Dorset.
- Dockray, J. V., O.B.E., M.R.C.S.: Hoxne, Suffolk.
- Furness, H. S., M.D. Lond.: Melton Mowbray, Leicester.
- Guinan, J. T., L.R.C.P.I.: Rayleigh, Essex.
- Jones, J. D., M.R.C.S.: Llansawel, Carmarthen.
- Mathias, D. R. B., M.B. Camb., F.R.C.S.: Welshpool, Montgomery.
- Potts T. N. V., M.D. Durh.: Spilsby, Lincoln.
- Rees, W. G., B.M. Oxfd, M.R.C.P.: Nailsworth, Gloucester.
- Ross, J., M.B.: Fraserburgh, Aberdeen.
- Stephen, G. A., M.B. St. And.: Lochgelly, Fife.
- Temple, F. F., M.B. Edin.: Alford, Lincoln.
- Yuill, Mary E., M.B. Camb.: Marple, Cheshire.

Medical Diary

JULY 28—AUG. 3

Thursday, Aug. 1

Royal College of Surgeons of England, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. A. L. d'Abreu: War Surgery of the Chest. (Hunterian lecture.)

Births, Marriages, and Deaths

BIRTHS

Arden.—On July 16, at Bournemouth, the wife of Surgeon Lieut.-Commander L. D. Arden, R.N.—a son.
Cochrane.—On July 18, in London, Dr. Sheila Cochrane, the wife of Mr. H. L. Cochrane, F.R.C.S.—a son.
Hart.—On July 19, at Cork, the wife of Dr. F. Dudley Hart—a daughter.
Jory.—On July 16, the wife of Mr. Norman Jory, F.R.C.S.—a son.
Mowbray.—On July 19, at Newcastle-on-Tyne, the wife of Dr. Robert Mowbray—a son.
Sames.—On July 10, at Northwood, the wife of Major C. Patrick Sames, R.A.M.C.—a daughter.
Sanford.—On July 14, the wife of Mr. D. Astley Sanford, F.R.C.S. of Sunderland—a son.
Taylor.—On July 14, at Aberdeen, the wife of Dr. A. R. Taylor—a daughter.

MARRIAGES

Hart—Sawday.—On July 20, in London, Robert John Collins Hart, M.R.C.S., to Mary Winifred Sawday.
Heathfield—Woodcock.—On April 29, at Secunderabad, India, Kenneth William Gordon Heathfield, M.D., captain R.A.M.C., to Dorothy Phyllis Woodcock, Q.A.I.M.N.S./R.
Mackenzie—Momber.—On July 16, at High Barnet, Dr. Evan Pratt Mackenzie to Beatrice Margaret Momber.
Minchin—Passmore.—On June 4, in India, R. L. Haviland Minchin, lieut.-colonel I.M.S., to Marian Frances Passmore, P.M., R.A.F.N.S.

DEATHS

Craig.—On July 10, at Welwyn, John William Craig, L.R.C.P.E.
Crichton.—On July 20, at Redhill, Crawford Smith Crichton, M.D. Edin., aged 64.
Dunlop.—On July 15, at Bracknell, Binnie Dunlop, M.B. Glasg.
Lanyon-Owen.—On July 16, in London, Lanyon Edward Lanyon-Owen, M.R.C.S., lieut.-colonel late R.A.M.C.
Le Fleming.—On July 16, at Wimborne, Sir Kaye Le Fleming, M.B. Camb., hon. M.D. Dubl. and Melb.
Roberts.—On July 19, at Prenton, Robert Edward Roberts, M.D. Lpool, F.F.R., F.R.C.P.
Smith.—On July 19, at Folkestone, George Francis Smith, M.R.C.S.
Waller.—On July 16, William Walls Waller, B.M. Oxfd, of Church Crookham, Hants, aged 58.

VISUAL DEFECTS IN PRISONERS-OF-WAR FROM THE FAR EAST

H. E. Hobbs
F.R.C.S.
SQUADRON-LEADER R.A.F.V.R., OPHTHALMIC SPECIALIST

F. A. Forbes
M.B. Aberd.
FLIGHT-LIEUT. R.A.F.V.R., MEDICAL OFFICER IN VARIOUS P.O.W. CAMPS IN JAVA AND AMBOINA

Towards the end of 1945 most of the Royal Air Force personnel liberated from Japanese prisoner-of-war camps were repatriated and were medically examined at a unit in this country, where numerous visual defects among them called for investigation, the results of which are detailed here. More than 2500 men were seen, and a questionnaire about details of dietary deficiencies, available alcohol and smoking materials, and general and ocular diseases was returned by some 1470 of them. These answers, together with the first-hand reports of their medical officers and our own observations, have provided the data for this report.

Most of these men had been imprisoned first in Java and transferred thence in working parties to other places—many to the Amboina group of the Molucca islands, and some to Japan, Singapore, and Malaya—and the visual defects had appeared at different times under the varied conditions of the camps, but chiefly in two main groups: either during the first year in Java (26%), or after 6–9 months in Amboina (62%).

In Java the general standard of health was relatively good; limited outbreaks of malaria and dysentery arose, and sore throats and tropical ulcers of the legs were fairly common. The diet, though barely adequate and badly balanced, could be supplemented through the black market with limited amounts of fruit, vegetables, meat, and eggs; lack of protein was its most notable defect. After some months, complaints of sore lips and tongue began to arise, and the men were found to have injection and desquamation at the mucocutaneous junctions of the mouth, with similar injected areas on the tongue. In one camp, after a dysentery epidemic which involved about half of the total complement of 4000, these symptoms became more severe and were accompanied by "burning feet" (and sometimes hands), sore red watering eyes, and in some cases blurring of vision.

Patients with visual symptoms were examined by Captain D. Schwarr, ophthalmologist, Royal Dutch Indian Army Medical Service, who described the condition thus:

> "It commenced in general with symptoms of chronic conjunctivitis and the appearance of scotomata, central for colour, and central, paracentral, and peripheral negative defects between which vision got worse and worse, so that a total negative central scotoma arose with vision of 2/300 with 30° eccentricity in some cases. In a number of cases the fundus showed no abnormality in the early stages. In some the optic disk became abnormally pinkish-red, and this was followed by slight papillœdema, with distension of the retinal veins and marked macular œdema. In rare cases retinal hæmorrhages were seen. Later the disk recovered its colour, and typical temporal atrophy appeared."

On transfer to Amboina, where, after several months, 62% of the cases here considered arose, much worse conditions were encountered: the diet was more strictly limited, and occasional additions were possible only by individual bartering—e.g., for eggs and fish. Working-conditions were more severe, and hard manual labour was exacted, from all who could walk, in working parties whose task was to level an airstrip from the coral. These parties included often the ambulant sick. Hospital facilities were of the crudest, and drugs limited to magnesium sulphate, some vitamin preparations of doubtful quality, and an abundance of camphor, calcium, and caffeine injections. Disease in these circumstances soon became rife; a dysentery outbreak, beginning on the ships en route from Java, reached epidemic proportions within a month and left a legacy of chronic diarrhœa, later complicated by beriberi, pellagra, and severe œdema. Within two months deaths in one camp totalled 200, and there were 1000 sick out of a total complement of 2071. Repeated representations to the Japanese in charge led, several months later, to some improvement in conditions and diet, the relative nature of which will be seen from the analysis of the rations during the improved period (table I).

Visual defects, resembling those arising in Java, began to give rise to serious concern within a few months of arrival, and to them were added complaints of night-blindness and "coral-blindness," a condition characterised by photophobia and ocular pain with lacrimation and intense blepharospasm. This condition, which developed among men working long hours in intense sunlight on the white coral, responded within a day or so to rest in the shade, leaving usually no defect of vision, and was considered to be an inflammation due to ultraviolet light, comparable with snow-blindness.

VISUAL DEFECTS

Among the cases examined, defects of vision, recovered or still present, were a feature of the history of a large proportion and were classified into three broad groups:

Group I: those with defective reading vision only, usually transient.

Group II: those with transient blurring of both reading and distance vision.

Group III: those with a persistent defect of both reading and distance vision.

Few had persistent night-blindness.

Groups I and II presented mainly problems of refraction, most of them falling into group I, and these appeared to have had a temporary asthenopia associated with their very debilitated condition before liberation. The visual acuity was within normal limits, and no abnormality of media, fundi, or ocular movements was seen. Some, men approaching presbyopic age, were in need of lenses for reading. Among the few patients whose distance vision also had blurred were some with errors of refraction—chiefly hypermetropic astigmatism and hypermetropia—sufficient to explain their symptoms, and these showed no sign of ocular disease. In the rest *paracentral scotomata* remained as evidence of past optic neuritis, and these are included with the cases of partial optic atrophy considered below.

Group III numbered about 250, and included a few men with active ocular disease: syphilitic and non-specific uveitis and syphilitic disseminated choroiditis, and one or two with nystagmus and extraocular muscle palsies. The remainder comprised:

(1) a number with fully correctable refractive errors—chiefly myopic and mixed astigmatism—in whose visual fields no scotomata appeared; and

(2) a larger group in whom correction with lenses produced little or no improvement in vision, and whose visual fields showed absolute or relative scotomata to white test objects. These cases, with those of recovered optic neuritis referred to above, form a group of 163 cases of *partial optic atrophy*.

PARTIAL OPTIC ATROPHY

The history in 89% of these 163 cases was of gradual *deterioration of vision* within the first or second year of captivity, occurring either as a general blurring of vision or as scotomata. In them the defects had increased over a period of weeks or months until the reading of even large print became impossible and facial features were recognisable only with difficulty at a distance ranging from a yard to a few yards. At this stage some of the most severely affected had been provided, through their medical officers, with "blind" badges denoting their condition to their captors. A more rapid onset was not uncommon, and in 11% the visual loss had developed within twenty-four hours.

The onset of the defect had in many cases been insidious

London County Council

Dr. Raymond H. Swindells, medical superintendent of New End Hospital since 1930, is retiring at the end of this month. The hospitals and medical services committee, recalling that he entered the service of the Fulham board of guardians in 1911, *speak of the exceptional service rendered* in the long career of this "most able and zealous officer." During the war of 1914–18 Dr. Swindells served in Gallipoli, Egypt, Palestine, and Syria.

A Reinstatement Case

The Folkestone Reinstatement Committee on July 12 awarded Dr. Albert Pearlman £400 compensation against the Folkestone corporation, by whom he was employed as a Civil Defence medical officer of health, at a salary of £400, from the outbreak of war until September, 1942, when he was called up. It was stated that on May 9 the War Office informed Major Pearlman that in view of the findings of a medical board he must relinquish his commission as from July 4. He was given 56 days' leave, and on May 27 applied for reinstatement in the position of part-time M.O.H. at a salary of £250. The Town Clerk, for the corporation, said that this was not an application for reinstatement but a reply to an advertisement in the public press for the office of part-time medical officer. The position was advertised, as required by *the Ministry of Health, and had been filled with the* approval of the Ministry. Dr. Pearlman's services had been satisfactory, and if there was a vacant position, when it was reasonable and practicable no doubt the corporation would consider Dr. Pearlman as an applicant. Mr. N. L. Taylor, for the appellant, said the position was one which the corporation had no power to make and the Ministry had no power to approve. The committee found that Dr. Pearlman's application satisfied the provisions of the Reinstatement Act; there had been default by the corporation in their discharge of their duties under the Act. It was not reasonable and practicable to order the employment of Dr. Pearlman in his former position, but they ordered the corporation to pay him £400 compensation for loss suffered or likely to be suffered through the corporation's default. Each party gave notice of appeal.

International Surgical Society

The next congress of this society will be held in London from Sept. 14 to 20, 1947. The president will be Dr. Leopold Mayer, of Brussels; the general secretary is Dr. L. Dejardin, also of Brussels. Local arrangements will be in the hands of a British committee, of which Prof. G. Grey Turner is chairman, and Mr. H. W. S. Wright, 9, Weymouth Street, Portland Place, W.1, is hon. secretary.

Provision of Nurseries

The London Women's Parliament and the National Society of Children's Nurseries are calling a joint conference on Sunday, July 28, at the Conway Hall, Red Lion Square, London, W.C.1. The speakers will include Dr. J. D. Kershaw, M.O.H. for Accrington. In the past fifteen months there has been a drop of 248 in the number of nurseries, and this conference is being called to discuss the need for a comprehensive nursery service as part of the recognised social services in the country.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. Richard Battle, M.B.E., F.R.C.S., Gorselands, Horsell Common, Woking, Surrey, and 148, Harley Street, W.1. (Tel.: Wel. 1207.)
Mr. Guy Blackburn, M.B.E., F.R.C.S., 51, Harley Street, W.1. (Tel.: Langham 3711.)
Dr. N. S. Plummer, F.R.C.P., 49, Harley Street, W.1.
Mr. F. J. Rutter, F.R.C.S.E., 3, Barnfield Crescent, Exeter.
Mr. Reginald S. Strang, F.R.C.S., 3, Westbourne Road, Edgbaston, Birmingham, 13.
Dr. C. C. Ungley, F.R.C.P., 13, Portland Terrace, Newcastle-upon-Tyne, 2.

In a leading article on Problem Families (June 22) we said that Pacifist Service Units are sponsored by the Society of Friends. We are informed that this is not so. Pacifist Service Units (whose address is 6, Endsleigh Street, London, W.C.1) is an independent organisation, drawing its members from all sections of the pacifist movement.—In a note on the new monthly journal, *Nutrition and Child Welfare*, on p. 58 of our issue of July 13, we mentioned with regret that *Maternity and Child Welfare* had come to an end in 1934. In fact it was incorporated, in October, 1934, with *Mother and Child*, the journal of the National Baby Welfare Council.

Appointments

Calvert, Mary, M.B. Belf.: M.O., Nigeria (Colonial Service).
Elbert, J. J., M.B.E., M.B. Glasg.: M.O., Nigeria (Colonial Service).
Galbraith, A. J., M.D. Edin.: deputy medical superintendent, Brighton Mental Hospital, Haywards Heath.
Smith, A. G., M.D. Glasg., F.R.C.S.: dermatological specialist medical referee for county-court districts of Beccles, Lowestoft, Norwich, Bury St. Edmunds, Ipswich, and other towns in the Eastern Counties.

Middlesex Hospital, London, W.1:
- Dinnick, O. P., M.B. Lond., D.A.: anæsthetist.
- Murray, C. J. B., M.S. Lond., F.R.C.S.: asst. surgeon.
- Newman, P. H., D.S.O., M.C., F.R.C.S.: asst. orthopædic surgeon.
- Willcox, Arthur, M.D. Camb., M.R.C.P.: asst. physician.

St. George's Hospital, London, S.W.1:
- Crawford, Theodore, M.D. Glasg., F.R.F.P.S.: director of pathology.
- Dow, J. F., M.B. Camb., M.R.C.P.: asst. physician.
- Hunter, M. I. A., M.D. Camb., M.R.C.P.: asst. physician.
- Siddons, A. M. H., M.Chir. Camb., F.R.C.S.: asst. surgeon.
- Smith, Rodney, M.S. Lond., F.R.C.S.: asst. surgeon.
- Williams, Denis, M.D. Manc., F.R.C.P.: asst. neurologist.

Royal South Hants and Southampton Hospital:
- Eagar, F. J., L.R.C.P.I.: dermatologist.
- Langston, H. H., M.B. Lond., F.R.C.S.: orthopædic surgeon.
- Meller, H. K., M.B.E., M.B. Lond., M.R.C.P.: asst. physician.
- Richardson, L. A., M.B. Camb., F.R.C.S.: asst. surgeon.
- Robertson, K. M., M.D. Lond., M.R.C.P.: physician.
- Todd, P. G., M.D. Lond., M.R.C.P.: asst. physician.
- White, H. O., M.R.C.S.: asst. anæsthetist.
- Zorab, E. C., M.B. Lond., D.O.M.S.: ophthalmic surgeon.

Cardiff Royal Infirmary:
- Evans, Dillwyn, M.B. Wales, F.R.C.S.E.: surgeon in charge of fracture and orthopædic dept.
- Evans, R. Bryon, M.D. Lond., M.R.C.P.: asst. physician (general medicine).
- Hodgson, G. S., M.B.E., D.M. Oxfd: dermatologist.
- Mogg, R. A., M.B. Wales, F.R.C.S.: asst. surgeon (urology).
- Spillane, J. D., M.D. Wales, M.R.C.P.: asst. physician (neurology).
- Thomas, H. A., M.B. Wales, F.R.C.S.E.: asst. surgeon, E.N.T. dept.

Examining Surgeons under the Factories Act, 1937:
- Barber, C. H., D.S.O., D.M. Oxfd: Thame, Oxford.
- Braybrooke, M. K., M.R.C.S.: Tetbury, Gloucester.
- Brown, Alexander, M.B. Glasg.: Linton, Cambridge.
- Dalley, Gilbert, M.R.C.S.: Poole, Dorset.
- Dockray, J. V., O.B.E., M.R.C.S.: Hoxne, Suffolk.
- Furness, H. S., M.D. Lond.: Melton Mowbray, Leicester.
- Guinan, J. T., L.R.C.P.I.: Rayleigh, Essex.
- Jones, J. D., M.R.C.S.: Llansawel, Carmarthen.
- Mathias, D. R. B., M.B. Camb., F.R.C.S.: Welshpool, Montgomery.
- Potts T. N. V., M.D. Durh.: Spilsby, Lincoln.
- Rees, W. G., B.M. Oxfd, M.R.C.P.: Nailsworth, Gloucester.
- Ross, J., M.B.: Fraserburgh, Aberdeen.
- Stephen, G. A., M.B. St. And.: Lochgelly, Fife.
- Temple, F. F., M.B. Edin.: Alford, Lincoln.
- Yuill, Mary E., M.B. Camb.: Marple, Cheshire.

Medical Diary

JULY 28—AUG. 3

***Thursday*, Aug. 1**

Royal College of Surgeons of England, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. A. L. d'Abreu: War Surgery of the Chest. (Hunterian lecture.)

Births, Marriages, and Deaths

BIRTHS

Arden.—On July 16, at Bournemouth, the wife of Surgeon Lieut.-Commander L. D. Arden, R.N.—a son.
Cochrane.—On July 18, in London, Dr. Sheila Cochrane, the wife of Mr. H. L. Cochrane, F.R.C.S.—a son.
Hart.—On July 19, at Cork, the wife of Dr. F. Dudley Hart—a daughter.
Jory.—On July 16, the wife of Mr. Norman Jory, F.R.C.S.—a son.
Mowbray.—On July 19, at Newcastle-on-Tyne, the wife of Dr. Robert Mowbray—a son.
Sames.—On July 10, at Northwood, the wife of Major C. Patrick Sames, R.A.M.C.—a daughter.
Sanford.—On July 14, the wife of Mr. D. Astley Sanford, F.R.C.S. of Sunderland—a son.
Taylor.—On July 14, at Aberdeen, the wife of Dr. A. R. Taylor—a daughter.

MARRIAGES

Hart—Sawday.—On July 20, in London, Robert John Collins Hart, M.R.C.S., to Mary Winifred Sawday.
Heathfield—Woodcock.—On April 29, at Secunderabad, India, Kenneth William Gordon Heathfield, M.D., captain R.A.M.C., to Dorothy Phyllis Woodcock, Q.A.I.M.N.S./R.
Mackenzie—Momber.—On July 10, at High Barnet, Dr. Evan Pratt Mackenzie to Beatrice Margaret Momber.
Minchin—Passmore.—On June 4, in India, R. L. Haviland Minchin, lieut.-colonel I.M.S., to Marian Frances Passmore, P.M., R.A.F.N.S.

DEATHS

Craig.—On July 10, at Welwyn, John William Craig, L.R.C.P.E.
Crichton.—On July 20, at Redhill, Crawford Smith Crichton, M.D. Edin., aged 64.
Dunlop.—On July 15, at Bracknell, Binnie Dunlop, M.B. Glasg.
Lanyon-Owen.—On July 16, in London, Lanyon Edward Lanyon-Owen, M.R.C.S., lieut.-colonel late R.A.M.C.
Le Fleming.—On July 16, at Wimborne, Sir Kaye Le Fleming, M.B. Camb., hon. M.D. Dubl. and Melb.
Roberts.—On July 19, at Prenton, Robert Edward Roberts, M.D. Lpool, F.F.R., F.R.C.P.
Smith.—On July 19, at Folkestone, George Francis Smith, M.R.C.S.
Waller.—On July 16, William Walls Waller, B.M. Oxfd, of Church Crookham, Hants, aged 58.

this nutritional neuropathy remain unknown or at the most are speculative, the clinical features are precise and clear. Certain parts of the central nervous system are principally affected: optic nerves, peripheral nerves, posterior columns of the spinal cord, and, less commonly, other cranial nerves—trigeminal (sensory), auditory, and vagus (recurrent laryngeal branch)—and pyramidal tracts. Various combinations of such lesions may be present in individual cases. Of the above-mentioned 37 cases 12 had evidence of peripheral neuritis, 5 of posterior-column damage, and 20 of combined nerve and posterior-column damage. Among this total were 6 cases of nerve-deafness and 4 of pyramidal-tract involvement.

From the point of view of disability, posterior-column degeneration has usually been the most serious lesion. The severest cases show a profound ataxic paraplegia, with loss of sense of position as high as the hip-joint and wrist, and loss of vibration sense as high as the lumbar or thoracic spine, tendon reflexes being lost. Few have survived to present such gross damage; but lesser degrees of similar damage are more common—here reflexes are preserved. Residual signs of peripheral neuritis have been less severe: numbness of fingers, feet, and legs and occasionally excessive sweating, but rarely paræsthesia. Objectively there is diminution or loss of pain and touch sensation of glove-and-stocking distribution, and sometimes hyperæsthesia of the skin and tenderness of the muscles of the extremities. Pronounced muscle weakness or atrophy has been uncommon in the group, the intrinsic foot muscles being chiefly affected, and after them the long flexors and extensors of the toes. Reflexes are lost or diminished in these cases.

In none has spasticity been seen, the only sign of pyramidal-tract involvement being the isolated presence of extensor plantar responses.

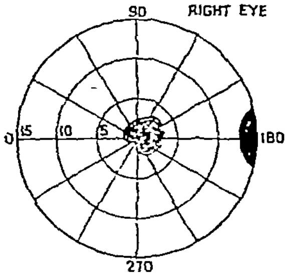


Fig. 2—Aged 25: corrected visual acuity 6/24 scotomatously. Insidious onset. Absolute scotomata to 4 mm. (black) and 2 mm. (cross-hatched) white with surrounding relative area to 2/2000 white (single-hatched).

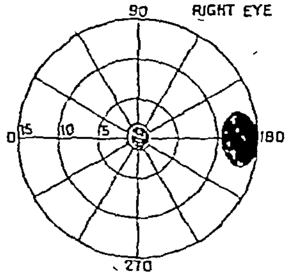


Fig. 3—Aged 22: visual acuity 6/9 scotomatously, reads J.2. Insidious onset. Absolute (cross-hatched) and relative (single-hatched) scotomata to 2/1200 mm. white at 2000 mm.

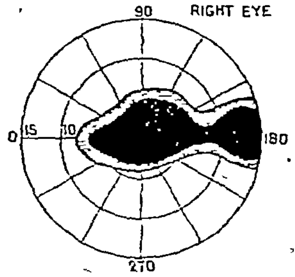


Fig. 4—Aged 46: corrected visual acuity finger-counting at 1 metre. Onset with dry beriberi following sore lips, tongue, and scrotum. Absolute bilateral scotomata to 20 mm. (black) and 10 mm. (cross-hatched) white at 2000 mm.

In all cases the effects of cord and nerve damage have been more pronounced in the legs than in the arms. Eighth-nerve damage has been unilateral or bilateral, never complete, and sometimes accompanied by tinnitus.

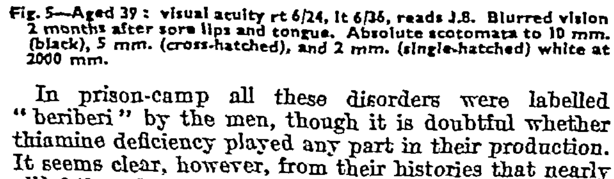


Fig. 5—Aged 37: visual acuity rt 6/24, lt 6/36, reads J.8. Blurred vision 2 months after sore lips and tongue. Absolute scotomata to 10 mm. (black), 5 mm. (cross-hatched), and 2 mm. (single-hatched) white at 2000 mm.

In prison-camp all these disorders were labelled "beriberi" by the men, though it is doubtful whether thiamine deficiency played any part in their production. It seems clear, however, from their histories that nearly all of them had at one time a definite *peripheral neuritis*—i.e., a symmetrical paralysis of the limbs, with foot-drop and wrist-drop, partial or complete, and a sensory loss of glove-and-stocking distribution. Posterior-column degeneration was rendered obvious in some cases by the recovery of the peripheral nerve symptoms.

One final point is noteworthy: as in the case of the optic atrophy, the precipitation or exacerbation of the neuropathy was closely related to preceding infections, particularly malaria and dysentery. In the one case an increased metabolism, and in the other the additional effect of decreased absorption from the diseased intestinal mucosa, produced a greater lack of those factors which normally prevent the development of this syndrome.

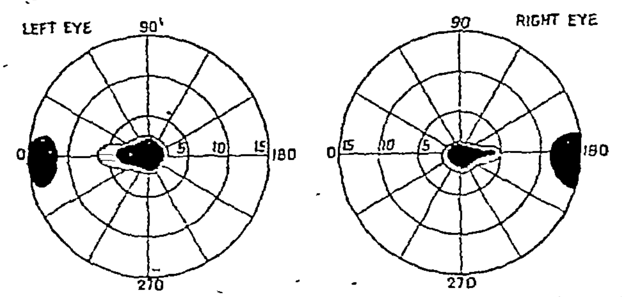


Fig. 1—Aged 25: visual acuity rt 6/60, lt 6/36, reads J.10. Gradual onset after sore lips, tongue, and scrotum. Absolute scotomata to 2 mm. (hatched) and 10 mm. (black) white at 2000 mm.

These cases have differed from those described among German prisoners-of-war in the Middle East by Spillane and Scott (1945) only in the greater incidence of polyneuritis among them.

TREATMENT

In the Active Stage.—Facilities for treatment in the active stage differed considerably from camp to camp. For the cases which developed during the first year in Java drugs were available and limited dietary additions possible. In his clinical trials at this time Captain Schwarr obtained "very good results" from the addition of three eggs a day to the prison diet, with or without artificial pyrexia, and he speaks well of meat, liver, and fish given similarly. He had "no successes" with yeast, and "fully negative results" with vitamin B_1, 5000 I.U. per day by injection for two weeks; lactoflavine 20 mg. per day for two weeks; nicotinamide 100 mg. per day for two weeks; vitamin C 160 mg. per day for two weeks; and beans 100 g. extra per day. Increasing the rice ration appeared to have definitely harmful effects. Captain Schwarr refers also to preventive experiments carried out when numerous new cases were arising. In these additions of liver, eggs, meat, beans, and fruit respectively were made to the rations of separate camps, and only in those where extra animal protein was provided did no fresh cases arise. None was found in one camp where an extra supply of canned meat was still available.

When visual defects began to appear in Amboina, little treatment was possible and personal dietary additions could be made only occasionally by bartering. A few of the patients seen could obtain extra food in this way (as eggs in all but one man, who bought fresh fish), and it is perhaps significant that the remaining defect in these cases is a moderate one, with fair visual acuity and scotomata which are paracentral and relative.

and unrelated to other disease, so far as could be recollected. The relationships, where ascertainable, are detailed in table II. The blurring of vision, which is now the presenting symptom, is in many cases described as a black spot which decapitates a man when he is viewed directly, or which obliterates words when reading.

Visual Acuity.—After refraction a few (6%) had visual acuity of less than 6/60 in either eye, and a similar proportion 6/6 in both; in 55% the visual acuity lay between 6/60, 6/60 and 6/24, 6/24; in the remaining 33% vision, though subnormal, was better than this.

Fundus.—Pallor of the central halves of the disks was present in most cases and commonly appeared as a pallid sector between the inferior and superior temporal retinal vessels; attenuation of the vessels was noted only in one or two of the most severe cases with generalised pallor of the disk. Signs of retinal disturbance were not common and when present were noted between the macula and the disk as small areas of pigmentary disturbance. In 8 cases these changes were seen under red-free light to affect the macular area.

Perimetry showed no significant constriction of the peripheral fields in any but the more severely affected cases, among which one or two with large scotomata involving both fixation and blind spots showed a constriction of 20°–30° to 2 and 5/330 white.

Examination of central fields revealed various types of defects, all of which lay in the centrocæcal area, the most common finding was bilateral absolute central scotomata to 2, 5, 10, or 15/2000 white (figs. 1 and 4), and in such cases the associated loss of visual acuity was correspondingly great. In others, less severely affected, scotomata less dense and less centrally placed appeared, and these often took the form of central and paracentral relative scotomata with eccentric absolute nuclei (figs. 2 and 5), which in some cases formed a partial ring and left the fixation area clear (fig. 3). In others there were minute scotomata about the central area where the 2-mm. white object appeared to "flash on and off."

TABLE I—ANALYSIS OF RATIONS, HAROEKOE, NOVEMBER, 1943, TO JUNE, 1944 *

Food item	Amount g./man/day	Carbohydrate (g.)	Fat (g.)	Protein (g.)	Vitamin A I.U.	Vitamin B_1 I.U.	Vitamin B_2 I.U.	Vitamin C (mg.)	Calories
Polished rice ..	594·0	464·0	1·8	41·7	..	59·0	..	..	2039
Fresh meat ..	4·1	..	0·2	0·8	2·4	1·2	5·8	..	5
Salt meat ..	18·3	..	1·1	3·6	..	7·2	..	..	24
Vegetable oil ..	18·0	..	15·2	..	..	..	..	..	137
Sugar	22·2	21·8	..	..	..	..	..	..	87
Salt	20·4	..	..	..	..	..	..	..	..
Tapioca flour ..	8·8	7·7	..	..	..	..	..	..	31
Smoked fish ..	15·2	..	..	2·3	..	..	..	..	9
Kedele beans ..	46·6	..	1·5	11·0	30·4	23·2	..	..	60
Katella ..	149·7	44·9	0·6	1·5	..	14·9	..	..	191
Green papaya	182·6	0·3	..	0·6	..	..	..	..	3
Cucumber ..	97·2	1·7	0·2	2·1	..	..	..	..	17
"Green vegetables"	58·0	2·4	0·5	4·3	1165·0	21·4	..	11·6	30
Lombok ..	3·9	..	..	..	..	..	..	4·9	..
Onions.. ..	4·5	0·2	..	..	..	..	..	..	1
Unripe bananas	78·0	6·6	0·1	..	25·0	12·5	..	..	27
Coconuts ..	3·0	0·4	0·7	0·1	..	..	..	..	8
Total ..	1324·5	550·0	21·9	68·6	1228·8	139·4	5·8	16·5	2669

* Obtained from Dutch medical sources in Amboina.

TABLE II—ONSET OF VISUAL DEFECT IN RELATION TO OTHER DISEASE AMONG 163 CASES OF OPTIC ATROPHY

Disease	Cases	Visual defect	
		Time of onset	Type of onset
Beriberi	23	During active stage	Gradual
	5	Ditto	Sudden (one to a few days)
	16	After recovery	Gradual
Pellagra	1	During active stage	Gradual
	1	Ditto	Within a day
	2	After recovery	Gradual (one had beriberi at the time)
	2	Ditto	Sudden (one within an hour, one in a day)
Sore lips, tongue, and scrotum	9	During active lesions	Gradual
	1	Ditto	Within a day
"Burning feet" ..	3	During complaint	Gradual
	7	After recovery	Gradual
	1	Ditto	Within a day
Dysentery	8	During active stage	Gradual
	6	Soon after recovery	Gradual
	5	Ditto	Overnight or within a day
Dysentery and beriberi	6	During active stage	Gradual
	7	Soon after recovery	Gradual
Coral-blindness ..	1	After the attack	Present on subsidence of acute symptoms
	1	Ditto	Gradual
P.U.O.	1	Immediately after illness	Gradual
Malaria	2	Ditto	Gradual
Anæmia	1	Ditto	Gradual
Typhoid fever ..	1	Ditto	Gradual
No history of other lesion preceding visual defect	50	..	Gradual
	3	..	Within a few days

"Gradual" in all cases implies slow progression over a period of months. Of these cases 62% first noticed visual deterioration while in Amboina, 26% in Java, and the remainder in Japan (8), Singapore (3), Hong-Kong (3), Siam (5), or on board ship (1).

Slit-lamp examination of cases reviewed the nasal, temporal, and inferior corneal quadrants in a group of 53 cases with the following results:

48% showed a few vessels in the limbic area and none penetrating clear cornea; 42% had also a few penetrating vascular twigs; 10% showed also an occasional single arcade within the limbus.

"Ghost vessels" of more than a single arcade in depth were not encountered.

The findings in 20 cases are given in table III. No correlation has been found between the history and the clinical picture which would justify the belief, at first entertained by us, that a group of cases of more abrupt onset and greater recovery could be separated from the whole. The signs of an established papillomacular-bundle lesion of various degrees of severity were found in both types of case.

The negative slit-lamp findings are, we believe, to be expected now that there has been time for some months of normal diet to take effect, and they appear to confirm Ridley's (1945) prognosis of improvement in the cases with active injection seen by him soon after liberation.

General Neurological Findings (Squadron-Leader G. S. Graveson).—Most of these patients were ambulant, and the blood Wassermann or Kahn reactions negative in all. Many gave a history of nerve lesions, past or present.

Of the 163 cases of partial optic atrophy 90 have so far been seen, of which number 37 have neurological lesions in addition to optic atrophy, and these probably represent all of those in the group having serious organic disorders outside the optic nerves. Many have had a neuropathy and recovered; indeed, of these 90 only 21 give no history suggesting neuropathy.

Though the food factors whose lack has produced o treatment, which was chiefly dietetic, and in default if any other then known cause he considered them to be due to malaria.

Cases having a more definite association with excoriating lesions of the lips, tongue, and scrotum have since been described from Nyasaland (Stannus 1911), Jamaica (Scott 1918), Sierra Leone (Wright 1927), Nigeria (Moore 1934, 1937), Malaya (Landor and Pallister 1935), and elsewhere, and their nutritional origin has been emphasised by the later writers. The close association with pellagrous lesions was commented on by Stannus (1911) and has since been repeatedly emphasised by observers who record the response of the acute lesions to improved diet—with the addition of 'Marmite' and cod-liver oil (Wright 1927, Moore 1934, 1937); liver, yeast, or marmite (Landor and Pallister 1935); and nicotinic acid (Wilkinson and King 1944). All have noted the resistant nature of the visual and aural defects unless treatment is begun early.

The prophylactic value of animal protein was mentioned by Moore (1937), who considered the condition to be preventable by the inclusion in the diet of adequate proteins of high biological value, and by Wilkinson and King (1944), whose cases differ from others in having shown no scotomata. The latter writers contend that lack, or a relative deprivation, of first-class protein is a precipitating factor in the onset of the disease. Goldsmith (1946) has lately supported this view.

The 163 cases here described are closely similar to the late stages of those described by Spillane and Scott (1945) in German prisoners-of-war (with the neurological differences already noted); and, in their ocular defects, they resemble those reported by Ridley (1945) among British prisoners seen shortly after liberation from Japanese camps. The association with mucocutaneous lesions referred to by the earlier observers is less constant in our cases, though it is probably stronger than table II suggests, since a large proportion of personnel had such lesions at one time or another—thus of 53 men specifically questioned on the point, 16 gave a history of sore lips, tongue, and/or scrotum either at the onset of the visual symptoms or within the preceding three months.

No evidence was found to incriminate either alcohol (to which few had had access in any form) or tobacco. Few of the men were of the age-group in which tobacco amblyopia is common; some were non-smokers, and the proportion who could obtain tobacco, as cigars, cigarettes, good pipe tobacco, or shag, was similar among the affected and unaffected. The geographical distribution of the cases and their varied times of appearance seem to be against an exogenous toxic origin.

The occurrence of the condition among poorly nourished men in whom deficiency diseases due to lack of the vitamin-B complex were widespread is clearly in favour of a nutritional cause. The fact that at least 62% of the cases appeared after a dysentery epidemic in which the great majority of prisoners were involved is probably significant in view of the effect which such disease would have on intestinal biosynthesis and absorption of vitamins. Such biosynthesis has been clearly demonstrated, in man by Najjar and Holt (1943) in respect of aneurine, and by Ellinger et al. (1944) in the case of nicotinic acid.

The disappointing results of treatment in the early stage with yeast and with the individual components of the vitamin-B complex, and the superiority of animal protein over yeast in prevention and treatment, suggest that some factor besides vitamin B, contained in animal protein, is necessary to prevent the onset of these lesions. The incidence of the majority of the cases in two groups, one in Java when protein deficiency first began to be felt, and the second in Amboina when this lack was further accentuated, appears to support the contention of Wilkinson and King (1944) that this lack is a precipitating factor in the disease, and it may well be that the rôle of protein consists in promoting the biosynthesis of vitamins in the intestine.

With regard to the refractive errors, the recognised tendency for hypermetropia to increase in tropical conditions as ciliary muscle-tone decreases with that of the general musculature led us to expect a preponderance of such errors; but, in fact, myopic errors far exceed them in the men who required glasses. We are unable to explain this, but it is interesting that the appearance of myopic and mixed astigmatism was noted as a transient phenomenon in Royal Air Force personnel in Iraq by Livingston (1932). The duration of the defects in our cases makes it unlikely that recovery will be so complete.

We wish to thank the Director-General, Medical Branch, Royal Air Force, for permission to publish this paper; Air Commodore P. C. Livingston, O.B.E., A.F.C., F.R.C.S., for providing the facilities for the ocular part of the investigation; Squadron-Leaders H. M. Finzel, B. H. O'Dowd, and W. G. Bridges for help in the preliminary ophthalmic examinations; Squadron-Leader G. S. Graveson for his report on the neurological findings; Section Officers M. E. Sharland, V. J. Goodman, J. Norman, R. Gibb, and R. F. M. Rowe for their invaluable aid in carrying out the field examinations; and Captain D. Schwarr for permission to use his findings in Java.

REFERENCES

Ellinger, P., Coulson, R. A., Benesch, R. (1944) *Nature, Lond.* **154**, 270.
Goldsmith, H. (1946) *Brit. med. J.* i, 407.
Landor, J. V., Pallister, R. A. (1935) *Trans. R. Soc. trop. Med. Hyg.* **29**, 121.
Livingston, P. C. (1932) *Brit. J. Ophthal.* **16**, 577.
Moore, D. G. F. (1934) *Ann. trop. Med. Parasit.* **28**, 295.
— (1937) *Lancet*, i, 1225.
Najjar, V. A., Holt, L. E. jun. (1943) *J. Amer. med. Ass.* **123**, 683.
Ridley, H. (1945) *Brit. J. Ophthal.* **29**, 613.
Scott, H. H. (1918) *Ann. trop. Med. Parasit.* **12**, 109.
Spillane, J. D., Scott, G. I. (1945) *Lancet*, ii, 261.
Stannus, H. S. (1911) *Trans. R. Soc. trop. Med. Hyg.* 1911/12, p. 112.
Strachan, H. (1888) *Sajons' J.* 1.
— (1897) *Practitioner*, vol. lix, p. 477.
Wilkinson, P. B., King, A. (1944) *Lancet*, i, 528.
Wright, E. J. (1927) *Med. sanit. Rep. Sierra Leone*, p. 29.

INTRATHECAL STREPTOMYCIN IN MENINGITIS

CLINICAL TRIAL IN TUBERCULOUS, COLIFORM, AND OTHER INFECTIONS

Sir HUGH CAIRNS
K.B.E., D.M. Oxfd
B.S. Adelaide, F.R.C.S.
NUFFIELD PROFESSOR OF SURGERY

E. S. DUTHIE[*]
M.B. Dubl.
DEMONSTRATOR OF PATHOLOGY AND MAY READER IN MEDICINE

HONOR V. SMITH
M.B., B.Sc. Lond.
RESEARCH ASSISTANT, NUFFIELD DEPARTMENT OF SURGERY.

From the University of Oxford

THIS is the report of a trial of streptomycin given intrathecally in meningitis due to organisms which have been shown to be sensitive to streptomycin in vitro and in laboratory animals. The trial is not complete, but the results to date are on the whole so unfavourable as to indicate that the quick success obtained with penicillin in the treatment of pneumococcal and other susceptible forms of meningitis will not be repeated with streptomycin. The results indicate also that intrathecal injections of streptomycin may be risky, and may require certain special safeguards. At a time when urgent appeals are being made in this and other countries for supplies of streptomycin for treatment of individual cases of meningitis we think that our preliminary results should be made known even though they are not conclusive.

Streptomycin, kindly supplied by Merck & Co. Inc., lots 200 and 213, was given intrathecally in solutions of 10,000–20,000 units per c.cm. of normal saline. Seven cases of meningitis were treated, and preliminary tests were also made in two cases of inoperable malignant brain tumour. The bacteriology, range of dosage, route of injection, incidence

---

[*] With a grant from the Nuffield Provincial Hospitals Trust.

TABLE III—OCULAR FINDINGS IN 20 CASES OF PARTIAL OPTIC ATROPHY

Case	Related general disease	Previous vision	Present vision Distance (Snellen) Reading (Jaeger)	Fundus	Scotomata
1	None	6/6, 6/6	R. 6/60 −0·50 D.S. = 6/36 L. 6/60 −0·50 D.S. = 6/36 Reads J.6	Pallid temporal sectors of both disks	Bilateral absolute central
2		6/6, 6/6	R. 4/60, L. 6/60 Reads J.8 (+1·5 D.S.)	Bilateral temporal disk pallor	
3		6/5, 6/5	R. and L. 6/36 −0·50 D.S. = 6/36 Reads J.8	Ditto	
4		—	R. 4/60 L. 6/60 −0·5/−1·0 = 6/36 Reads J.10	Hemipallor of right disk, left shows pallid temporal sector	
5		"Normal"	R. 6/60 −0·75 D.S. = 6/24 L. 6/60 −1·25/0·5 = 6/24 Reads J.8	Bilateral temporal disk pallor with pigmentary disturbance at maculæ	Absolute scotomata, right paracentral, left central
6		"Normal"	R. 6/36 −/−1·0 = 6/24 L. 6/36 −0·5/−1·0 = 6/24 Reads J.4 (+1·50 D.S.)	Slight bilateral temporal pallor	Bilateral pericentral
7	With sore lips, tongue, and scrotum at the onset or within the preceding three months	6/5, 6/5	R. 6/18 −0·50 D.S. = 6/12 L. 6/24 −0·75 D.S. = 6/18 Reads J.4	Bilateral temporal pallor of disks	Bilateral central relati with absolute paracentral nuclei
8		6/5, 6/5	R. 6/60, L. 5/60 Reads J.6 (+2·0 D.S.)	Ditto	Bilateral relative centr cæcal with absolute central nuclei
9		6/12, 6/18 (uncorrected)	R. 6/60 +4·5 D.S. = 6/18 L. 3/60 +5·0 D.S. = 6/24 Reads J.4	Ditto	Bilateral absolute central
10		6/6, 6/6	R. 6/24 L. 6/60 −/−0·75 = 6/36 Reads J.6	Bilateral pallid temporal sectors of disks	
11		6/6, 6/6	R. 6/60 −0·5/−1·0 = 6/24 L. 3/60 −0·5/−1·0 = 6/60 Reads J.8	Ditto	
12	Pellagra shortly before ocular disturbance	6/6, 6/6	R. 6/60, L. 2/60 Reads J.12 (+2·0 D.S.)	Marked bilateral temporal pallor	
13	Onset during or shortly after "beriberi"	"Normal"	R. 6/36 −0·5/−1·0 = 6/18 L. 6/36 −0·5/−1·0 = 6/24 Reads J.4	Within normal limits	Bilateral central relati with paracentral nucl
14		6/6, 6/9	R. 6/36 −1·0/−0·5 = 6/18 L. 6/36 −0·5/−1·0 = 6/24 Reads J.6	Ditto	Bilateral absolute central
15		6/6, 6/6	R. 3/60 −0·5/−0·5 = 6/60 L. 3/60 −0·5/−0·5 = 4/60 Reads J.10	Bilateral pallid temporal sectors of disks	
16		6/36, 6/36	R. 3/60 −4·5/−1·0 = 6/60 L. 3/60 −0·5 D.S. = 3/60 Reads J.10	Marked temporal pallor with streak of atrophy at left macula	
17		6/6, 6/6	R. 6/24 −0·75 D.S. = 6/18 L. 3/60 Reads J.6	Left hemi-, right sector disk pallor; pigmentary disturbance at maculæ	
18		6/6, 6/6	R. and L. 6/60 Reads J.10 (+1·5 D.S.)	Bilateral pallid temporal sectors of disks	
19		—	R. and L. C.F. at 1 metre Reads J.12 (+2·0 D.S.)	Well-marked bilateral temporal pallor	Bilateral absolute centrocæcal
20		6/5, 6/5	R. and L. 6/60 Reads J.10 (+2·0 D.S.)	Right hemi-, left sector disk pallor	Bilateral relative centr with absolute paracentral nuclei

The issue to all personnel of a ration of yeast infusion made from cultures of airborne yeasts grown by Flight-Lieutenant L. J. Audus, D.SC., was begun in December, 1943. The vitamin content of this could not be determined, but from the time of its administration the incidence of pellagra diminished considerably, though there was little improvement in the eye cases.

Treatment was again more freely available when men were returned in sick drafts to Java some months later, but this, also, appears to have had little effect.

Of the Established Lesion.—High-protein diets, with extra eggs and milk, and vitamin tablets containing aneurine (3 mg.), riboflavine (3 mg.), nicotinamide (30 mg.), ascorbic acid (75 mg.), vitamin A (4500 I.U.), and vitamin D (450 I.U.) were given, and a group of 53 men were re-examined after an interval of some weeks. As would be expected from the clinical findings and the duration of the lesion, the response to treatment in th men was poor, and such improvement as has been no (ability to read a further line of Snellen types with substantial reduction in the size of the scotoma) may w be purely subjective and explained by the patien increased ability to make use of his scotomatous visi

DISCUSSION

Scotomatous vision, developing in association w sensory disturbances of the limbs, injection of t conjunctiva, desquamation of the lips, and *later* defe of locomotion and hearing, appears to have been fi noted by Strachan (1888) in his account of cases of m tiple peripheral neuritis in Jamaica. The condition whi he describes (1897) resembles, in its clinical features, bo in the active stage and in the residual lesions, our cas with the difference that the ulnar and herpetic lesic which he found were not seen by us. His cases respond

TABLE II—REACTION OF MENINGES TO STREPTOMYCIN

Case no.	Pathology	Dose (units)	Route of administration	Stage	Cells per c.mm.			Protein*
					Polymorphs	Monocytes	Red cells	
1	Glioma	50,000	Lumbar	Before streptomycin	0	4	1800	60
				After streptomycin	230	20	13,000	70
2	Melanomatosis	100,000	Ventricular	Before streptomycin	6	72	..	350
				After streptomycin	820	60	..	350

* mg. per 100 c.cm.

(but patient may have had a previous episode of ventriculitis before he came under our observation). He was given streptomycin into the left lateral ventricle for thirteen days through an indwelling catheter, and the concentration of streptomycin in the ventricular fluid never fell below 20 units per c.cm. in tested samples. The organism was normally sensitive to streptomycin in vitro and remained so when last tested on the tenth day of treatment.

Streptomycin injected into the ventricle could not be recovered from the lumbar C.S.F., and vice versa. Streptomycin was injected by the lumbar route but without regularity, so that the lumbar C.S.F. did not always contain streptomycin. The total dosage of streptomycin (intraventricular and lumbar) throughout the thirteen-day course was 600,000 units.

Throughout treatment *Ps. pyocyanea* was grown from every sample of ventricular or lumbar C.S.F. The patient died fourteen days after treatment began.

Necropsy showed active ventriculitis: the ventricular system was filled with thick greenish-yellow pus, and the ependymal lining was replaced by a grey translucent fibrous layer 0·3 cm. wide. Basal meninges were thickened but showed little macroscopic pus, and there was extensive subarachnoid hæmorrhage in the spinal canal.

CASE 4 (*pyocyaneus meningitis after gunshot wound of neck involving posterior arch of atlas and dura, followed by local wound infection, necrosis of exposed atlas, and cerebrospinal leak*).—Treatment with streptomycin was begun ten days after *Ps. pyocyanea* had been first grown from the C.S.F., by which time there was already a block, with greatly increased amount of protein in lumbar and ventricular C.S.F., and the patient was confused, incontinent, swallowing with difficulty, and his peripheral circulation was poor.

In vitro the organism did not grow in the presence of streptomycin 10 units per c.cm., but after several passages it grew in the presence of 400 units per c.cm.

Treatment was given by daily intraventricular injections for four days (total 210,000 units) and one lumbar injection of 100,000 units on the first day. Twenty-four hours after the first injection the number of organisms diminished considerably, and on the fourth day of treatment the ventricular C.S.F. was sterile. However, ten hours after the fourth injection the patient had sudden respiratory failure and died.

Necropsy showed thick yellow pus in the spinal canal and in the basal cisterns. The foramina of Magendie and Luschka were occluded by fibrous tissue. The 3rd and 4th ventricles were filled with thick gelatinous pus, the aqueduct of Sylvius and the right foramen of Monro were blocked by thick pus, and the lateral ventricles, which were dilated, also contained pus. The ventricular walls consisted of a thick shaggy membrane.

There was thus no clear correlation between the in-vitro sensitivity of the organism and the clinical effect of the drug, and in fact organisms of normal sensitivity were found in C.S.F. containing many times the theoretical *bactericidal* concentration of streptomycin. This may be because pus and other necrotic products have a more acid reaction than C.S.F. and thus reduce the bactericidal action of streptomycin (Abraham and Duthie 1946). This finding is similar to that of Reimann et al. (1945), who in a case of typhoid fever grew organisms from the blood in spite of a blood-streptomycin level considerably higher than that required to kill the organism in vitro.

No effect on the bacteria could be observed in our two cases of tuberculous meningitis, since in case 8 the patient died eight hours after treatment was begun, and in case 9 the reaction to the small lumbar injection of streptomycin was so alarming that no further injections were given. Cooke et al. (1946) report a case of tuberculous meningitis with survival after protracted intramuscular and intrathecal treatment with streptomycin. Though the case is encouraging, organisms did not disappear from the C.S.F. until a month after treatment was begun.

The clinical progress in our cases closely paralleled the effect of streptomycin on the organism. In case 6 the patient recovered, some improvement was seen in case 7, and in the other cases no beneficial effects could be detected.

RESULTS

All three cases of pyocyaneus meningitis, the case of influenzal meningitis, and the two cases of tuberculous meningitis were fatal. The patient with achromobacterium meningitis was the only one to recover.

DISCUSSION AND SUMMARY

These cases indicate that treatment of advanced pyocyaneus meningitis with intrathecal streptomycin is not likely to be effective. This is not surprising, since necropsies have shown the presence of one or more blocks in the cerebrospinal pathways, and the ventricular lining converted into a thick shaggy purulent membrane. In this type of case also there is much pus in the ventricle and cisterns, and large doses of streptomycin, as in case 3, may be ineffective in sterilising the C.S.F.

In meningitis of recent onset the results of streptomycin are less discouraging. In the achromobacterium infection there was prompt subsidence of infection after use of streptomycin. In the infant with *H. influenzæ* infection streptomycin treatment was followed by decrease in the number of the organisms and by clinical improvement. Cerebral vascular thrombosis then developed, and the infection recurred.

Doses of the order of 80,000–100,000 units, once or twice daily, are probably necessary, and in acutely ill patients such injections are not free from danger, either as an immediate effect from local irritation of the hind brain, or as a delayed effect from secondary rise of intracranial pressure. Injections should be given slowly (5000–10,000 units a minute), and a safety valve should be provided in the form of an indwelling ventricular catheter draining at a pressure of 200 mm. H_2O. It is possible that at least some of the untoward reactions in these cases were due to impurities and that the risks will diminish as purer preparations become available.

REFERENCES

Abraham, E. P., Duthie, E. S. (1946) *Lancet*, i, 455.
Cooke, R. E., Dunphy, D. L., Blake, F. G. (1946) *Yale J. Biol. Med.* 18, 221.
Reimann, H. A., Elias, W. F., Price, A. H. (1945) *J. Amer. med. Ass.* 128, 175.

"... Those whose duty it is to operate schemes for the betterment of the national health know that ignorance and apathy are two of the most stubborn enemies of progress. The only known method of combating their evil influence is by developing a national health consciousness through health education. ... No really substantial and lasting improvement in the health of the country can be achieved without the active coöperation of the people and such coöperation does not come instinctively. ... *Health teaching* is as worthy of serious thought as any other form of teaching and it requires all the aids that educationists and publicists can bring to its service. At the same time, it must always be supplementary to the educational work of existing health services."—SIR ANDREW DAVIDSON, chief medical officer, Department of Health for Scotland, speaking at Edinburgh on July 13.

of unfavourable reactions, and results are shown in table I. Owing to limited supplies no case was treated systemically.

UNFAVOURABLE REACTIONS

The incidence of unfavourable reactions following the first injection of streptomycin was high. In cases 5, 6, 8, and 9 the patients became deeply comatose, with disturbance of pulse, temperature, and respiration. The reaction in case 9, a boy aged 8 years, was particularly alarming, as it followed lumbar injection of only 2500 units. In cases 5 and 8 the patients died some hours later of respiratory failure. Though both these patients were severely ill at the time of the injection, neither appeared moribund, and in particular the patient with tuberculous meningitis (case 8) was responding fairly well and seemed likely to live for several days. In case 7 the reaction was mild: the patient, an infant aged 9 months, showed a slight rise of temperature and pulse-rate, with an increase in the tension of the anterior fontanelle, beginning five hours after lumbar injections of 15,000 and 20,000 units. Yet another patient (case 4) died of sudden respiratory failure eight hours after his fourth intraventricular injection; but as he was extremely ill, possibly he died from the meningitis rather than from the effects of the streptomycin.

Reactions thus followed both lumbar and ventricular injections. There is some evidence that they developed more rapidly after the ventricular injections, since, though in case 9 the patient had a rigor during the lumbar injection, he did not become comatose until two hours later. Large doses were given into the lateral ventricles in cases 3 and 4 without mishap, but in these it was established post mortem that there was a blockage of the cerebrospinal pathways preventing the streptomycin from reaching the brain stem, where this type of reaction is probably set up. Further, in case 3, a cerebellar decompression had been performed and the streptomycin was given through an indwelling catheter. Both these measures would tend to prevent a dangerous rise in intracranial pressure, which may well have been a factor in the other cases.

Reaction of the Meninges.—In both patients with tumour (cases 1 and 2) there was a moderate increase in the number of cells in the lumbar cerebrospinal fluid (C.S.F.) within twenty-four hours of the injection (table II). No such reaction was detected in the cases of meningitis.

SPREAD AND RETENTION OF STREPTOMYCIN IN C.S.F.

Streptomycin evidently does not spread so quickly as penicillin, for in case 6 (achromobacterium meningitis) half an hour after intraventricular injection of streptomycin 100,000 units and penicillin 10,000 units the lumbar C.S.F. contained 400 units of penicillin per c.cm. and no streptomycin. In two pyocyaneus meningitis cases attempts to study spread demonstrated a complete block between spinal subarachnoid space and ventricle, subsequently confirmed by necropsy; however, streptomycin was shown to spread freely and quickly from one lateral ventricle to the other.

After injections of 15,000–20,000 units in an infant (case 7) no streptomycin was present twenty-four hours later. After injection of 30,000 units into the lateral ventricle in case 4 ventricular concentration of streptomycin had dropped to 2·5 units per c.cm. in twenty hours, but after injection of 80,000 units it was 30 units thirteen and a half hours and 12·5 units thirty-two hours later. With combined lumbar and ventricular injection totalling 120,000 units the lumbar concentration twelve hours later was 50 units per c.cm. (case 6).

EFFECT ON BACTERIA AND CLINICAL PROGRESS

In case 6 (achromobacterium infection) the C.S.F. became and remained sterile twenty-four hours after the first injection of streptomycin, whereas in case 7 (*H. influenzæ*) the intensity of the infection was decreased, in that colonies grown on culture of the C.S.F. were sparser and only appeared in forty-eight hours instead of twenty-four hours. No effect was detected in the cases of *Ps. pyocyaneus* meningitis (cases 3 and 4).

CASE 3 (*pyocyaneus meningitis after cerebellar decompression in a case of lateral sinus thrombosis, cerebral and cerebellar abscess*).—Treatment was begun on the tenth day of meningitis

TABLE I—RESULTS OF TREATMENT WITH STREPTOMYCIN

Case no.	Bacteriology	Route of administration	Largest single dose (units)	Total dosage (units)	Reaction to injection	Interval between injection and reaction	Meningeal reaction	No. of organisms in C.S.F.	Clinical progress	Ancillary treatment	Result
				TUMOUR CASES (PRELIMINARY TESTS)							
1	(Glioma)	L	50,000	50,000	None detected	..	Moderate pleocytosis	..	Unaffected	..	Died
2	(Melanomatosis)	V and L	100,000	240,000	None detected	..	Moderate pleocytosis	..	Unaffected	..	Died
				MENINGITIS CASES							
3	*Ps. pyocyanea*	V*	80,000	620,000	None detected	..	None detected	Unaffected	Unaffected	Sulphonamides; penicillin	Died
4	*Ps. pyocyanea*	V	100,000	210,000	None detected	..	None detected	Unaffected	Unaffected	Sulphonamides; penicillin	Died
5	*Ps. pyocyanea*	L	100,000	100,000	Fatal	7½ hr.	None detected	Unaffected	Rapid deterioration	Sulphonamides	Died
6	*Achromobacterium*	V and L	80,000	160,000	Very severe†	Immediate	None detected	Disappeared	Improved	Sulphonamides; penicillin	Recovered
7	*H. influenzæ*	L	20,000	50,000	Mild	5 hr.	None detected	Decreased	Improved	Specific antiserum ‡; sulphonamides; penicillin	Died
8	*Myco. tuberculosis*	L	100,000	100,000	Fatal	9 hr.	None detected	Unaffected	Rapid deterioration	None	Died
9	*Myco. tuberculosis*	L	2500	2500	Very severe	Immediate	None detected	Unaffected	Unaffected	..	Died

V = ventricular; L = lumbar. * Ventricle drained with indwelling catheter. † Reaction after ventricular injection. ‡ Serum given in initial, and penicillin in terminal, stages.

pernicious anæmia. His previous medical history was not relevant.

He was pale and icteric. Tongue normal. Tonsils large and pitted. Pulse-rate 120 per min., regular. Heart not enlarged; basal systolic murmur. Blood-pressure 200/120 mm. Hg. Lungs clear. No enlargement of liver or spleen; no abnormal mass in abdomen. Reflexes brisk; no sensory changes; fundi pale. Urine contained a trace of albumin. Blood-count: red cells 2,120,000 per c.mm., Hb 52%, colour-index 1·24, white cells 6200 per c.mm. (polymorphs 61%, lymphocytes 38%, monocytes 1%), reticulocytes 2·2%. Fractional gastric analysis showed achlorhydria.

He was admitted to hospital about three weeks later, when his red-cell count was 1,470,000 per c.mm. and the Hb had fallen to 36%. Sternal puncture showed a fairly cellular typically megaloblastic marrow. He was given 20 mg. of folic acid daily by mouth. On the fourth day reticulocytes rose to 6·6%, and on the eighth day reached 34·6%. On the tenth day sternal-marrow puncture showed an active predominantly normoblastic marrow, with very few megaloblasts. On this day the dose of folic acid was reduced to 10 mg. daily.

He continued to make steady progress; on the twenty-third day his red-cell count had reached 3,770,000 per c.mm. and Hb 88%. He had clinically recovered and was discharged to the outpatient clinic for continuation of treatment. The achlorhydria was still present.

CASE 4.—A married woman, aged 52, first attended the outpatient clinic in January, 1946, complaining of increasing headache, dizziness, dyspnœa and palpitation on exertion, and flatulent indigestion. At that time she was very pale. Tongue normal. Apart from some moist sounds at the left lung base, no notable signs were found in the other systems. She had achlorhydria. Blood-count showed a severe microcytic anæmia, and the sternal marrow was normoblastic.

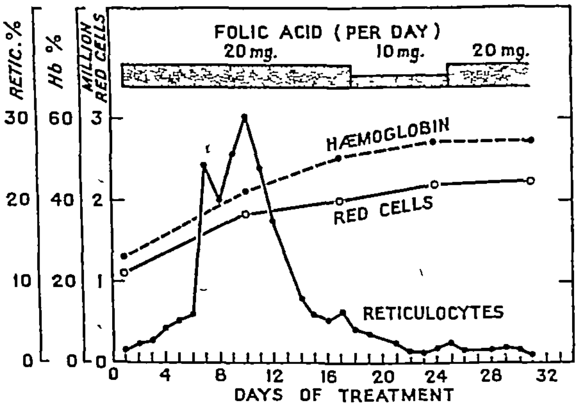


Fig. 2—Response of case 4 to folic acid (control period omitted).

She was treated with iron and improved, but only partially; in January the red cells were 3,100,000 per c.mm. and Hb 38%. In April the red cells were 2,710,000 per c.mm. and Hb 50%. Later it became clear that she had developed pernicious anæmia, and she was admitted to hospital for investigation.

She now had well-marked pallor and icterus. Tongue rather smooth. Finger-nails showed some koilonychia. Heart slightly enlarged to the left; blood-pressure 135/65 mm. Hg. Moist sounds at base of left lung. Spleen and liver not palpable; no abnormal mass in abdomen. Reflexes brisk except in right leg; no objective sensory changes; plantar responses flexor. Blood-count: red cells 1,170,000 per c.mm., Hb 26%, colour-index 1·13, white cells 7200 per c.mm., reticulocytes 2·4%. Sternal marrow: megaloblastic picture, but less cellular than usual; very few normoblasts. Radiography of lungs showed only basal congestion.

She was given 20 mg. of folic acid by mouth daily. On the seventh day of treatment the reticulocytes rose to 26%, and reached a peak of 30·6% on the tenth day. Sternal puncture, repeated on the eighth day, showed a predominantly normoblastic marrow, still not very cellular. On the seventeenth day her red-cell count was 1,980,000 per c.mm. and Hb 50%. The dose of folic acid was reduced to 10 mg. daily, as with the previous patients; but her recovery-rate was only slow and not comparable to the preceding cases (see fig. 2). After another week, therefore, the dose of folic acid was increased to 20 mg. daily, and on the thirty-first day the red-cell count was 2,280,000 per c.mm. and Hb 54%. Clinically she had recovered well, but the achlorhydria was unaffected.

RESPONSE TO FOLIC ACID IN 5 PATIENTS WITH PERNICIOUS ANÆMIA

Case	Erythrocytes (millions/c.mm.)					Hæmoglobin % (Haldane)					Reticulocytes %			Treatment	
											Initial	At peak	Day of peak	Folic acid by mouth (mg./day)	Days given
1	**1** 1·40	**10** 1·92	**17** 2·48	**24** 3·21	**31** 3·46	**1** 34	**10** 46	**17** 60	**24** 74	**31** 78	2·2	25·2	7	20 10*	17 14*
2	**1** 0·95	**11** 1·56	**18** 2·09	**25** 2·84	**32** 3·57	**1** 24	**11** 36	**18** 50	**25** 66	**32** 78	1·8	32·6	9	10 20 10*	1 17 13*
3	**1** 1·47	**9** 2·11	**16** 2·75	**23** 3·77	**35** 4·41	**1** 36	**9** 52	**16** 66	**23** 88	**35** 98	3·2	34·6	8	20 10*	9 14*
4	**1** 1·10	**10** 1·82	**17** 1·98	**24** 2·21	**31** 2·28	**1** 26	**10** 42	**17** 50	**24** 54	**31** 54	1·8	30·6	10	20 10 20*	17 7 7*
5	**1** 0·95	**6** 1·18	**13** 1·79	**20** 2·30	**27** 2·58	**1** 22	**6** 28	**13** 40	**20** 48	**27** 56	0·8	45·6	7	75 i.v. 75 i.v. 15 i.m.	1st 2nd 18th†

* Maintenance dose of folic acid being continued.
† Continued on alternate days.
Bold figures represent day of blood examination.

CASE 5.—A joiner, aged 58, said he had been diagnosed as pernicious anæmia eighteen years before. He had taken small quantities of desiccated stomach at more or less regular intervals, but for the last few months he had noted increasing pallor, fatigue, and dyspnœa, and was losing weight. He was extremely pale, with a dry skin and generalised œdema. Tongue normal. Pulse-rate 100 per min. Heart not enlarged; blood-pressure 130/90 mm. Hg. Lungs clear. Liver enlarged to about 3 in. below costal margin, smooth, and not tender; spleen not palpable; no other abnormality in abdomen. Reflexes normal; no objective sensory change. Blood-count: red cells 1,210,000 per c.mm., Hb 28%, colour-index 1·16, white cells 2900 per c.mm. (polymorphs 49%, lymphocytes 45%, monocytes 5%, eosinophils 1%), reticulocytes 1%. Sternal marrow showed a typical megaloblastic hyperplasia. Fractional gastric analysis showed achlorhydria.

In this case 150 mg. of folic acid was given intravenously in a drip. The folic acid was dissolved with the aid of disodium phosphate and 75 mg. was given on each of two days. On the second day a blood-count showed red cells 950,000 per c.mm. and Hb 22%; reticulocytes 1·4%. On the fourth day reticulocytes had risen to 12·2%, and they reached a peak of 45·6% on the seventh day. On the eighth day sternal puncture showed a cellular normoblastic marrow with hardly any megaloblasts. As the table shows, progress has been steady, and treatment is being continued with 15 mg. i.m. on alternate days.

DISCUSSION

These results show clearly that synthetic folic acid will bring about remissions in patients with true Addisonian pernicious anæmia, and the responses seem in every way comparable to those obtained with the best pre-war liver extracts. The dosage used—20 mg. by mouth daily at first, reducing to 10 mg. when the remission is well advanced—appears, by results, to be minimal, and some patients may need more. In case 5 parenteral administration was highly successful in relieving his very desperate condition.

Folic acid is not the liver principle that has been obtained in a very concentrated form by other means. For instance, folic acid has an intense orange-yellow colour, whereas the purest liver principle preparations are colourless. Nevertheless, the indications from these results are that folic acid can safely be substituted for liver extracts at least in the early stages of treatment of true pernicious anæmia. The maintenance dose has yet to be worked out; this will take time, and at present there are not sufficient supplies for this purpose.

FOLIC ACID
IN THE TREATMENT OF PERNICIOUS ANÆMIA

REPORT OF FIVE CASES

JOHN F. WILKINSON
M.D., Ph.D. Manc., F.R.C.P. F.R.I.C.
PHYSICIAN IN CHARGE AND DIRECTOR

M. C. G. ISRAËLS
M.Sc., M.D.Manc. M.R.C.P.
ASSISTANT DIRECTOR

F. FLETCHER
M.D. Manc.
CHIEF MEDICAL ASSISTANT

Department of Clinical Investigations and Research, University and Royal Infirmary, Manchester

FOLIC acid, a component of the vitamin-B complex, was originally obtained by fractionation from liver; its presence was estimated by its ability to promote the growth of *Lactobacillus casei,* and it thus became known as the *L. casei* factor. In August, 1945, Angier and others announced the synthesis of a compound identical with the *L. casei* factor from liver, and recently (Angier et al. 1946) they have published details of its preparation and constitutional formula, showing it to be a compound of 2-amino-4-hydroxy-6-methyl pteridine and *p*-aminobenzoylglutamic acid. This synthetic folic acid was tested by Spies et al. (1945) in the treatment of nutritional macrocytic anæmia such as occurs in the southern States of the U.S.A.; the material was given by mouth, and an excellent response, with a sharp reticulocyte peak followed by a sustained rise in hæmoglobin and red cells, was obtained in every way comparable to the response to liver.

These results have been extended. Spies (1946a) has reported satisfactory responses to folic acid in sprue, macrocytic anæmia of pregnancy, and true Addisonian pernicious anæmia; Moore et al. (1945) reported a similar group. Darby et al. (1946) gave a convincing report of 3 cases of sprue; they showed that the folic-acid treatment initiated a change from megaloblastic to normoblastic marrow, and that folic acid would produce a response in a case in which other members of the vitamin-B complex had been given without result. Zuelzer and Ogden (1946) reported that, in a deficiency anæmia of infants with megaloblastic marrow, folic acid brought about a remission of the anæmia and a return of the marrow to a normoblastic picture.

Of all these reports those on pernicious anæmia are the least satisfactory, so it was important to try folic acid in the treatment of unequivocal cases. The patients in the small series recorded here all had the typical uncomplicated clinical picture of relapsing pernicious anæmia—megalocytic anæmia, megaloblastic marrow, and achlorhydria, but no signs of neurological involvement. They were either untreated or had had no effective treatment for some months; there was a preliminary control period of at least two weeks during which no treatment was given, the reticulocyte count remained low, and red cells and hæmoglobin did not show any rise. For criteria of satisfactory response we required (1) transformation of megaloblastic to normoblastic marrow; (2) a good reticulocyte response; (3) a sustained rise of red cells and hæmoglobin; and (4) clinical remission of symptoms.

MATERIAL AND DOSAGE

The folic acid was supplied in 5 mg. tablets and in powder form. It is a bright orange-yellow crystalline substance. For oral administration the tablets were used in daily doses of 20 mg. at first and then 10 mg. after about the fourteenth day of treatment. For parenteral use the folic acid was dissolved in water with the aid of disodium phosphate, and the solution autoclaved at 10 lb. for 15 min. or passed through a Seitz filter.

CASE-RECORDS

CASE 1.—A married woman, aged 63, had about twelve months' history of fatigue, loss of weight, and dyspnœa and palpitation on exertion. Apart from occasional nausea there were no digestive symptoms. Nothing relevant in past medical history or family history. She was very pale and slightly icteric. Tongue not smooth. Heart enlarged, apex just beyond midclavicular line in fifth space, hæmic murmurs present, blood-pressure 175/90 mm. Hg. Lungs clear. No enlargement of liver or spleen. Abdomen obese; no abnormal mass palpable. Reflexes present; no signs of disease of central nervous system.

Blood-count: red cells 1,640,000 per c.mm., Hb 38% (Haldane), colour-index 1·15, white cells 6300 per c.mm. (polymorphs 62%, lymphocytes 23·5%, monocytes 5%, eosinophils 9%, basophils 0, myelocytes 0·5%), nucleated red cells 5 per 200 white cells, reticulocytes 3·2%. *Sternal puncture* showed a cellular very active marrow, with numerous typical megaloblasts of all stages, typically large metamyelocytes, and hardly any normoblasts. Fractional gastric analysis showed achlorhydria.

Folic acid was given in the dose of 20 mg. daily by mouth (10 mg. b.d.); on the seventh day the reticulocytes rose to 25·2%, and on the eighth day a sternal puncture showed a predominantly normoblastic marrow, active and cellular. Improvement thereafter was steady (see table). After eighteen days the dose of folic acid was reduced to 10 mg. daily, and on the twenty-fourth day her red cells were 3,210,000 per c.mm. and Hb 74%. Her clinical condition was good, the hæmic murmurs had disappeared, and she was discharged to the outpatient clinic shortly afterwards. The achlorhydria was still present.

CASE 2.—A married woman, aged 50, had been known to have pernicious anæmia for ten years and had responded to treatment on several occasions. She was remiss in keeping up her treatment and on this occasion was admitted to hospital in a weak state with the following blood-count: red cells 950,000 per c.mm., Hb 24%, colour-index 1·26, white cells 4400 per c.mm. Sternal puncture showed a very active typically megaloblastic marrow.

She was given 20 mg. of folic acid daily by mouth. On the eighth day reticulocytes were 30·8%, and on the ninth 32·6%. Sternal puncture on the ninth day showed a predominantly normoblastic marrow of considerable activity. On the eleventh day the red-cell count was 1,560,000 per c.mm. and Hb 36%. Progress was thereafter steady (see table and fig. 1). After eighteen days the dose of folic acid was reduced to 10 mg. daily. The blood-count continued to rise, and on the thirty-first day red cells were 3,570,000 per c.mm. and Hb 78%. Clinically she had greatly improved and was fit for discharge to the outpatient clinic. The achlorhydria persisted unchanged.

CASE 3.—A male garment-maker, aged 47, had been under treatment for twelve months for throat trouble and had noted increasing dyspnœa and palpitation on exertion, falling off of appetite, and flatulence. A week before attending hospital he had collapsed at work. His mother had died of

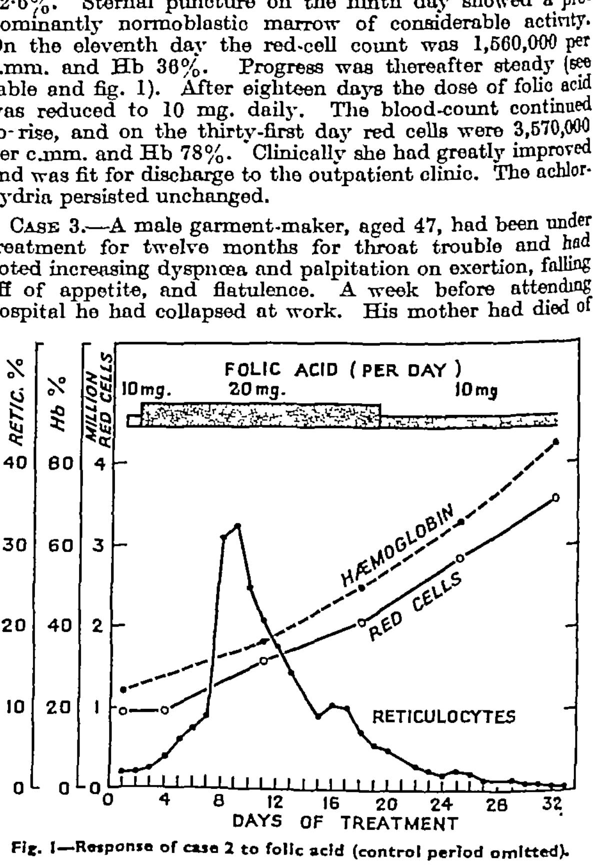


Fig. 1—Response of case 2 to folic acid (control period omitted).

of specific desensitisation with pollen extract to a dose of 20,000–30,000 units.) Possibly a combination of benadryl with co-seasonal specific treatment may become e method of choice, but that remains for further vestigation to decide. As a palliative in urticaria too, e results in the few cases in which I have given it have een dramatically successful, and it seems not unlikely om the recent American reports that benadryl will be ailed as the greatest advance in the palliative treatment f the allergic diseases since the discovery of the action f adrenaline.

I wish to thank Dr. J. Stanley White, of Parke, Davis nd Co., for the supply of benadryl.

REFERENCES

urtis, A. C., Owens, B. B. (1945) *Univ. Hosp. Bull., Ann Arbor,* 2, 25.
ale, H. H. (1929) *Lancet*, i, 1179, 1233, and 1285.
— Laidlaw, P. P. (1910) *J. Physiol.* 41, 318.
armer, L. (1941) *J. Lab. clin. Med.* 26, 702.
eldberg, W. (1941) *Annu. Rev. Physiol.* 3, 671.
arley, D. (1933) *Lancet*, ii, 1469.
— (1937) *J. Path. Bact.* 44, 589.
oelsche, G. A., Prickman, L. E., Carryer, H. M. (1945) *Proc. Mayo Clin.* 20, 432.
ewis, T. (1926) *Brit. med. J.* ii, 61.
oew, E. R., Kaiser, M. E., Moore, V. (1945) *J. Pharmacol.* 83, 120.
cElin, T. W., Horton, B. T. (1945a) *Proc. Mayo Clin.* 20, 417.
— — (1945b) *Proc. cent. Soc. clin. Res.* 18, 45.
cGavack, T. H., Elias, H., Boyd, L. J. (1946) *J. Lab. clin. Med.* 31, 560.
'Leary, P. A., Farber, E. M. (1945) *Proc. Mayo Clin.* 20, 429.
odd, L. C. (1946) *Sth. Med. Surg.* 108, 1.
Wells, J. A., Morris, H. C., Bull, H. B., Dragstedt, C. A. (1945) *J. Pharmacol.* 85, 122.

Preliminary Communication

FAT-DIGESTION IN SPRUE
STUDIED BY INTESTINAL INTUBATION

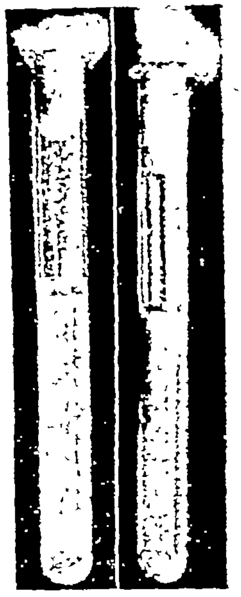
THE results of some preliminary investigations carried out to elucidate the mechanism of fat-digestion in subjects with tropical sprue are presented now, because few new cases are being encountered in the Royal Air Force, and other workers may be in a more favourable position to pursue the lines of investigation described.

Investigations have been carried out on ten patients invalided to this country with tropical sprue contracted in India, Burma, or Ceylon. Eight patients who had not served in tropical countries, had no present or past history of gastro-intestinal disorder, and were convalescent from orthopædic operations, acted as controls.

On the morning of the examination patients received no breakfast. At 9 A.M. a radio-opaque double-lumen Miller-Abbott tube was passed into the small intestine by the technique used by Miller and Abbott.[1] The tube was swallowed to the 72-in. mark, when the tip was about 40 in. beyond the pylorus, radioscopy being used to ascertain that the tube was not coiled in the stomach. The balloon was then deflated. After an interval of 30 min., suction of about 100 mm. Hg was applied to the lumen of the tube in communication with the small intestine. A trap was arranged so that the material obtained was collected in a bottle surrounded with ice. After the fasting juice had been collected for about 20 min., the patient swallowed 25 ml. of olive oil. The suction was continued and, whenever any alteration was noted in the character of the aspirated material, the bottle was changed. Fat began to appear in 30–90 min. after it had been swallowed, and specimens were collected until they no longer contained fat.

RESULTS

To the naked eye the material aspirated from sprue patients differed strikingly from that of the normal controls (see figure). Whereas that of the controls had the appearance of a uniformly suspended bile-stained emulsion, that of the sprue patients consisted of whitish threads and clumps suspended in a relatively clear bile-stained fluid. Microscopically these threads and clumps contained numerous fat droplets enmeshed in mucin-like material. In material obtained from normal patients droplets of similar size were seen, but they were evenly dispersed and not aggregated into clumps. In both the controls and the sprue patients most of the droplets stained blue with Nile blue sulphate (the specimens having been stored for 24 hours at 0° C), indicating the presence of fatty acids. Only a small proportion consisted of unsplit fat and stained pink, and this was well emulsified. Much of the mucoid material of the clumps also stained blue, suggesting the presence of fatty acids in a fine state of dispersal. Mucus stains (mucocarmine and thionin) showed small scattered conglomerations of mucus.


(a) (b)
Succus entericus 90 min. after feeding 25 ml. of olive oil by mouth to (a) normal subject; (b) sprue patient.

The extent of this abnormality varied in different patients. In some the clumps and threads were so abundant and thick that they blocked the tube, making aspiration very difficult, whereas in others they were much less plentiful. In general there was a rough correlation between the clinical severity of the disease and the degree of clumping.

In one patient the examination was carried out before and after successful treatment by diet and parenteral crude liver extract, and the character of the aspirated material changed considerably; clumps and threads in a fluid containing little emulsified fat gave place to only a few very small threads floating in a bile-stained emulsion of normal appearance.

It therefore appears that in the sprue syndrome fat is emulsified, and, as would be expected from stool fat-analysis, hydrolysed. The abnormality lies in either the aggregation into clumps and threads of the fatty material or the failure to disperse such aggregations if they occur as a transitory phase of normal digestion.

With the object of assessing the possibility of dispersing these clumps and threads, specimens of them from three patients were incubated at 37° C for 4 hours with fasting succus entericus:

(1) From normal patients;
(2) From normal patients with the addition of ox bile;
(3) From a patient with mild sprue;
(4) From a patient with mild sprue with the addition of ox bile;
(5) From a patient with severe sprue;
(6) From a patient with severe sprue with the addition of ox bile.

Good dispersal was obtained in (1), moderate dispersal in (3), and none in (5). The addition of ox bile to normal succus entericus (2) made no difference but did appear to increase the dispersal when added to sprue succus entericus (4) and (6). However, the dispersal was never so good as that obtained with normal juice.

DISCUSSION

The slender evidence we have obtained suggests that the clumps and threads consist mainly of fatty acids, both very finely dispersed and in droplet form, bound in a mucin-like matrix. Though it is generally agreed that mucus plays an important rôle in digestion, there is little detailed knowledge of its action. Mahlo and Mulli[2] have shown that it possesses both acid-combining and alkali-combining properties; and, despite little uniformity in experimental results, it seems fairly certain that mucin is considerably more resistant than other

---

[1] Miller, T. G., Abbott, W. O. *Amer. J. med. Sci.* 1934, 187, 595.

[2] Mahlo and Mulli. *Dtsch. med. Wschr.* 1934, 60, 1632.

How far treatment with synthetic folic acid may be successful in other forms of macrocytic anæmia remains to be defined. Spies (1946b) has already noted a case that responded to liver extract after failing to respond to folic acid, and it is likely that others will be found; but it is clear, from the reports already published, that folic acid can produce remission in most cases.

In all of our cases gastric achlorhydria persisted throughout the present periods of observation.

SUMMARY

Synthetic folic acid has been given to 5 patients with true pernicious anæmia in relapse.

The folic acid produced clinical remissions, with return of the marrows to normoblastic from megaloblastic states, and a restoration of blood-counts towards normal levels. The achlorhydria gastrica persisted.

Folic acid was supplied through the courtesy of Lederle Laboratories Inc. to Boots Pure Drug Co. Ltd., who placed it at our disposal for this investigation.

REFERENCES

Angier, R. B., et al. (1945) *Science*, **102**, 227.
— — (1946) *Ibid*, **103**, 667.
Darby, W. J., Jones, E., Johnson, H. C. (1946) *J. Amer. med. Ass.* **130**, 780.
Moore, C. V., Bierbaum, O. S., Welch, A. D., Wright, L. D. (1945) *J. Lab. clin. Med.* **30**, 1056.
Spies, T. D. (1946a) *Lancet*, i, 225.
— (1946b) *J. Amer. med. Ass.* **130**, 474.
— Vilter, C. F., Koch, M. B., Caldwell, M. H. (1945) *Sth. med. J., Alabama*, **38**, 707.
Zuelzer, W. W., Ogden, F. N. (1946) *Amer. J. Dis. Child.* **71**, 211.

BENADRYL IN HAY-FEVER

A NOTE ON ITS ACTION

David Harley
M.D., B.Sc. Edin., F.R.I.C.
From the Laboratories of the Inoculation Department, St. Mary's Hospital, London

'Benadryl' (β-dimethylaminoethyl benzhydryl ether hydrochloride) is a new antihistamine compound synthesised by Rieveschl and Huber in the research laboratories of Parke, Davis and Co.

Studies on animals have shown that it has a powerful antihistamine and antispasmodic effect, as evidenced by the degree of protection it gives against histamine bronchospasm and anaphylactic shock (Loew et al. 1945, Wells et al. 1945). Clinical trials have shown that it is highly effective in the treatment of urticaria and angioneurotic œdema (Curtis and Owens 1945, O'Leary and Farber 1945, Todd 1946), in hay-fever (McElin and Horton 1945a and b, Koelsche et al. 1945), and, to a lesser degree, in asthma and various other allergic conditions. Its administration was shown to reduce the skin reactivity to histamine (McGavack et al. 1946). Its action is thought to be brought about by adsorption, at the site of action of histamine, by which it blocks the effect of the latter (Wells et al. 1945). Low toxicity, absence of the side-effects of parasympatholytic drugs, and relative freedom from untoward reactions, characterise this action (McGavack et al. 1946).

The present paper reports the effect of benadryl on the histamine and grass-pollen skin reactions of hay-fever patients.

METHODS

A group of five hay-fever patients (grass-pollen-sensitive) was investigated. They were all typical cases and had received no treatment previously. Each patient was given three doses of 100 mg. (two 50-mg. capsules) of benadryl by mouth during the first day of treatment, followed by three doses of 50 mg. a day for six days. No other treatment was given. Skin-tests were carried out with histamine (1% of the acid phosphate), grass-pollen extract (20,000 units per c.cm.), and control carbol-saline, (1) before treatment was started, (2) at the end of the first day of treatment, and (3) on completion of the treatment. The prick method of testing was used, and all tests were made on the flexor surface of the forearms. Details of the technique of the prick-test, recording the reactions, and their measurement by planimeter, have been described previously (Harley 1933, 1937).

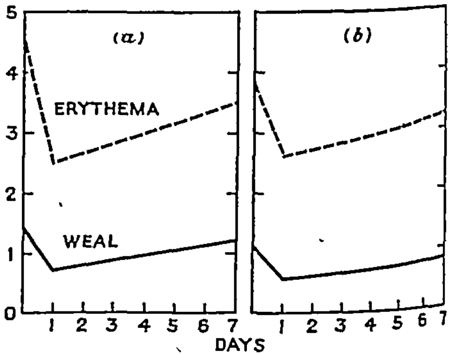
RESULTS

Skin Reactions.—The results of the skin-tests are set out in composite form in the figure. They demonstrate an approximate fourfold reduction of the area of the skin reaction to grass-pollen extract and to histamine as the result of the first day's treatment (benadryl 300 mg.). This reduction was definite in each case, and the erythema was considerably less intense. After six days' treatment with benadryl 150 mg. a day the skin reactions had returned to about three-quarters of their original size.

Clinical Effects.—Of the five patients treated, three were promptly and completely relieved of their hay-fever and remained so until 12–24 hours after the treatment was stopped, when the symptoms recurred. One patient was greatly improved (estimated 75% relief), and one patient was not apparently benefited. Side-effects developing during the first day of treatment consisted of dryness of the mouth, slight drowsiness, and "muzziness" in the head. These symptoms abated when the dose of benadryl was reduced to 150 mg. a day.

DISCUSSION

The histamine theory of the mechanism of the allergic diseases is based on the pioneer work of Dale and Laidlaw (1910) and Lewis (1926) and has received considerable support during recent years (Farmer 1941, Feldberg 1941). Briefly stated, it suggests that the allergic reaction is the expression of cellular damage produced by the special method of specific idiotoxin-idioceptor union on or in the cells, and, in common with other forms of cellular damage, is attended by the liberation of histamine (or a histamine-like substance, "H-substance") from the cells participating in the reaction, and that it is this H-substance that produces the changes in the capillaries, smooth muscle, &c., which constitute the allergic reaction. Dale (1929) believes that the reaction is due to the liberation of preformed histamine, present in the tissue cells, the union of idiotoxin with idioceptor on or in the cells acting like other injurious stimuli.



Composite skin reactions of five hay-fever patients before, during, and after benadryl treatment showing average diameters of weal and erythema after prick-tests with (a) pollen and (b) histamine. Control-tests with carbol-saline gave negative results throughout.

The tests detailed above demonstrate that benadryl reduces equally the histamine skin sensitivity and the specific pollen skin sensitivity, and thus support the histamine theory of allergy.

With regard to the clinical value of the drug in the treatment of hay-fever, the few cases herein reported (owing to the very limited supply of benadryl available) are insufficient for an accurate assessment, but it seems likely that benadryl will abolish the need for pre-seasonal specific desensitisation in many patients. (It is estimated that the degree of reduction of the pollen skin sensitivity produced by the first day's treatment with 300 mg. of benadryl was equivalent to that produced by a course

The distance between the physician and the educator was steadily decreasing as this emphasis grew. The work of the teacher would impinge on the life of the pupil at a greater variety of points. According to the Ince report on Juvenile Employment Service, adolescents of 14–18 years would all receive vocational guidance of some sort. There were three main needs:

(1) To fit juveniles to jobs according to their aptitude, qualifications, and interests.

) To divert them from harmful and/or unsuitable jobs.

) To distribute the supply of juveniles better.

he main weight of this task would fall on the teachers, nd the essential instrument in the scheme was the ecord from school life passed on to the Ministry of Labour —on the child's physique, intelligence attainments, ptitudes, and interests. Part of this work was nearer sychiatry than psychology, but it would have to be one by teachers. Teachers needed instruction in medical sychology as well as in normal psychology, and qualified sychiatrists should be available for consultations. eachers must be trained to recognise what needed a pecialist's care and opinion.

Mr. D. **Crichton-Miller** (headmaster of Fettes College) outlined what he felt was required by teachers rom psychiatrists. He wanted help with sex problems ue to late marriage, economic conditions, and the moral structure of society. He wanted help not only with the boy but also with both his parents. Teachers were very conscious of their failures. He hoped that ewer failures were sent out from schools now than wenty years ago, but people all over the country were ess well balanced, less happy, and less stable than they used to be. There were more parents who were unstable and without faith, and therefore there were more children n that state.

Dr. T. **Ferguson Rodger** felt that, with the advent of the atom bomb, the most important problem of today was the right relationship between man and his fellows —i.e., education in human relationships. He called for examination of group behaviour and the application of the knowledge so gained to group treatment—the process of adjustment went on throughout life by membership of groups, beginning with the family group with its early infantile relationships which are studied by psychoanalysts. The knowledge they acquired, however, must be applied to groups, and the facts about group behaviour should be revalued. Much had been gained by group tests for officer selection during the war, involving need for group activity along with competition for leadership. The community should be organised along the lines of greatest usefulness of its members—i.e., on democratic principles. Experience had shown that groups might fall into three types—the laissez-faire type, where there was a good deal of bickering and wasted time; the democratic type, which did most work and did it without friction; and the autocratic type, which did a lot of work but in which the leader was hated and yet the group was lost without its leader.

Legal Aspects of Psychiatry

Dr. W. **Norwood East** said that well-doing for the sake of praise was not commendable. Most criminals were essentially selfish, and could not postpone immediate gratification for ultimate advantage. Environmental stress might produce crime in those who were potential criminals. Society must be jealous of its rights if these rights were to survive; therefore it did not accept with equanimity psychiatric pleas in relation to criminal behaviour. Punishment was a necessary evil. Unfortunately the criminal leaving prison often had a real hostility to society, and it was the duty of society to prevent this. This required a high standard of civic responsibility and improvement in social conditions. Retribution in terms of reformation should be our aim, but justice must of course be dispassionate. Psychiatric help should be available in cases of mental deficiency, psychopathic personality, and psychoneurosis, to ascertain the extent to which behaviour is attributable to psychiatric causes, and it should always be available on release of the criminal. Psychiatrists should remember that psychiatry was still in its infancy and that their reports might be fallacious.

Lord **Cooper** (Lord Justice Clerk) reminded the meeting that Zeus came before Æsculapius and eventually slew him with a thunderbolt! Law courts and psychiatry had recently been drifting apart, and they needed renewed interpretation of each other. Harm had been done by the exaggerated and unfounded claims of some psychiatrists. Courts liked to be reasoned with and convinced, not presented with a report which was dogmatic and contained few reasons for the conclusions reached. Lord Cooper spoke on the Scottish defence of "diminished responsibility," saying that it had become a recognised point of ethics for advocates to ask for examination by one or two mental specialists. This plea had been overdone recently and was now almost always rejected by juries. In the long run the test was that of robust common sense, as represented by the average jurymen. It went against the grain to accept an arbitrarily assigned class of persons who might commit crime with diminished or no responsibility. Too often the psychiatrist's evidence subordinated nearly every consideration to the rehabilitation of the defendant. But the psychiatrist as well as the judge owed a duty to the community. Sometimes there was notable failure by the psychiatrist to verify independently the data on which his conclusions rested, so as to convince both judge and jury. They should consider now the desirability and possibility of establishing a board of psychiatrists to which crimes, and especially sexual offences, could be referred for investigation and report. They should also consider the question of the application of psychiatric treatment only after the sentence had been served. Lord Cooper emphasised that the punitive element must take precedence over treatment.

Dr. W. M. **McAlister** said that the question of "partial or diminished responsibility" applied only when the charge was murder, and only in Scotland. In 1923 Lord Alness had laid down three points in this connexion —aberration of mind, mental unsoundness, and great peculiarity of mind. Unless a person was certifiably insane he must needs answer for his deeds. The psychiatrist must exercise the utmost care before expressing a categorical opinion on responsibility, and medical men must know the express terms and conditions of the law.

Social Aspects of Psychiatry

Miss **Nora Milnes**, speaking on rehabilitation, discussed unselfishness in family life, ordinary family frictions, and the endless grumbles within the family. It was hard, she said, to know for how long a returned prisoner-of-war wanted and required spoiling, and she asked her hearers to think of the difficulties which his wife faced. It was the job of social workers to deal with all the minor family troubles. Preventive psychiatry was a sociological problem, and social workers needed full training. The ordinary family case-worker required to know when to call in the expert. The psychiatric social worker was the outward expression of the revolution which was taking place in family case-work—really a revolution in human relationship. They were dealing with the non-material needs of people, helping them in their development and thus increasing their capacity for living with satisfaction in a social group. The psychiatric social worker dealt with diagnosis of special causes of ill health and with the influences of environment upon individuals.

Prof. L. S. **Penrose** talked about the use and abuse of statistics, their interpretation, and their value. He said that Europe had shown an inverse ratio between the number of serious crimes and the number of certified patients. It had been demonstrated that when disturbed people were in mental hospitals there was less serious crime, but population survey regarding mental disease was very difficult. The crucial datum was not the number of patients in mental hospitals, nor the number of times a patient was in hospital, but the length of stay in hospital on each admission.

Prof. F. A. E. **Crew**, F.R.S., said that much had been learned from the major problems of the war, which were similar to the acute problems of the peace. The state of a people could be measured by death-rate, marriage-rate and birth-rate, illegitimacy, delinquency, unemployment, and many other factors, and the signs and symptoms of social ills had been abundantly recorded;

proteins to the digestive action of proteolytic enzymes.[3] In the intact rat mucus is well digested,[4] and the digestion of mucin is probably carried out by specific mucinases.

It has been suggested that mucus assists in the digestion of protein materials which become enmeshed in it, thereby being brought into close contact with pepsin and hydrochloric acid which have been adsorbed from the surrounding gastric juices. It is probable that mucus assists in the emulsification of fat, and it seems possible that, by adsorbing lipase, mucus also assists in the hydrolysis of fat. However, if the mucin is not digested, as appears to happen in sprue, there might well be some interference with the absorption of fatty acids.

The problem remains whether in sprue the digestion of mucus is impeded because the mucus itself is abnormal or because the digestive juices lack mucus-splitting ferment. The latter explanation seems to be the more probable in view of the dispersal of the threads and clumps from sprue patients when they are incubated with normal intestinal contents.

These findings are not in themselves of any value in elucidating the cause of sprue, but their biochemical implications deserve investigation, and it is hoped that they will supply a fresh approach for research which will shed further light on the cause and lead to more rational treatment of the disease.

Our thanks are due to Air Marshal Sir Harold Whittingham, lately Director-General of Medical Branch, R.A.F., and Air Commodore T. McClurkin, Director of Hygiene, R.A.F., for their encouragement and the facilities they have generously given us; and Mr. T. F. Macrae, D.SC., late wing-commander, R.A.F.

G. A. SMART
M.D., B.Sc. Durh., M.R.C.P.
SQUADRON-LEADER R.A.F.

RAYMOND DALEY
M.D. Camb., M.R.C.P.
FLIGHT-LIEUT. R.A.F.

R.A.F. Institute of Pathology and Tropical Medicine,
and Princess Mary's R.A.F. Hospital.

---

3. Anderson, R. K., Farmer, C. J. *Proc. Soc. exp. Biol., N.Y.* 1934, **32**, 21. Carlson, A. J. The Control of Hunger in Health and Disease, Chicago, 1919.
4. Anderson, R. K., Fogelson, S. J. *Proc. Soc. exp. Biol., N.Y.* 1935, **32**, 1204.

Medical Societies

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE 105th annual meeting was held in Edinburgh from July 17 to 19.

Experientia Docet

In his presidential address Prof. D. K. HENDERSON said it was most important that psychiatrists should be well-trained physicians. Hippocrates had said that learning, sagacity, humanity, and probity were essential for a physician, and a good psychiatrist needed these qualities plus a detailed knowledge of his own science and art, and insight into the difficulties besetting those with neurotic and mental disturbances. He emphasised the need for better training in psychiatry, and its branches, for all general physicians in the future. "Psychiatry," he said, "is the other half of medicine and not just another specialty. It consists in understanding the science of man and in maintaining mental health so that life can be conducted at the highest level of efficiency." We should help to create conditions which would foster peace, in which science could be constructive and not perverted to destruction. He called for a higher sense of responsibility to family and social obligations. There was still much need for the study of emotional states relating to the effects on the total personality, as determined by the history of reactions in the past to stress and strain. This knowledge could be used curatively if breakdown should take place. The new dynamic forms of therapy must be related to the background in which the illness occurred, and to the human factor present in every illness. The humanitarian and scientific sides needed each other as man and woman. Multiple causes were at the root of every form of nervous and mental illness.

Immense contributions had been made to psychiatric knowledge by men who had patiently worked in the wards of mental hospitals, without recognition. General medicine dealt with cross-sectional to the exclusion of longitudinal study of the person. It was necessary to develop power to assess the whole individual and the way he felt and reacted to any incident. Interesting facts had lately been emerging about conduct and the emotional drive being bound up with the hypothalamic region of the brain, leading us to consider the possibility of a hypothalamic rhythm determining the type of personality. In treatment there was no stereotyped answer and no infallible panacea, but there was need for the psychiatrist to explain to the patient a general working hypothesis in clear non-technical language. Psychiatrists had a duty to express fearlessly their views in relation to all social evils. The challenge of the unfit should be met before they are born, or at latest in their early formative years. Professor Henderson saw the psychiatry of the future as a form of mental hygiene for all.

Education in Relation to Psychiatry

Prof. ALEXANDER GRAY spoke about the preventive side of mental hygiene and those aspects of education of the young which have bearing on mental balance and poise. He asked the question, What upsets the young? Processes of education were difficult to define: the school and the schoolmaster had no monopoly, for there was in addition the education of the home, the education of the Church, and the education of the world. There might be a conflict between these educations, particularly in relation to standards of truth and loyalty, and such conflicts gave rise to disturbing maladjustments in children. Distinction must be made between the vocational side of education—namely, how to earn a living—and the cultural side of education, which develops personality and the ability to lead a full life and to find enjoyment. Professor Gray drew attention to the way in which the education of the young had changed after each of the two wars. He contrasted the stable world of the second half of the 19th century with the present time, when the younger generation saw a world with no stability. Blind obedience was gone; this was a questioning age, and people wanted to know why. Among young people there were signs of frustration from which the older generation did not suffer. Learning as such was at present at a discount, and it was a problem to know how education could be made exciting and not meaningless. Under-occupation was just as serious as over-occupation, and he advised that the burden of work for the young people should not be eased too much. He stressed the value of cultivating the habit of regular work. If education was to be a preparation for life, it ought to provide for a perpetual barricade against boredom.

No two children were alike, and teachers must therefore strike the highest common factor for their classes. Since man was essentially a creative animal, it was necessary to guide and train the hand as well as the mind. The happiest man was the man who was doing something. There was a sense of satisfaction in doing things for oneself—for example, playing the piano badly—rather than watching or listening to others, even though much more expert. There was too much talk of appreciation of art. This was a poor substitute for art itself.

Professor Gray discussed religious education and the importance of having religion as a universal possession and guide and inspiration. He felt that this was a help to mental balance, but our religions were still tied to the idea of an angry God and Hell. Symbolical religion was possible for adults but not for children, and the concepts of the angry Tribal God and everlasting Hell were torture for the child. They had to unlearn a great deal and they might resent those who had taught them originally. He noted with pleasure the improvement in sex education which had taken place in the last fifty years, and the recession of the idea, so evident in the Jewish and Christian traditions, that woman was essentially evil.

Prof. JAMES DREVER spoke about the emphasis now being placed on the promotion of health. He said that

PENICILLIN Glaxo

The degree of purity of penicillin is important in its clinical application. This purity is stated on each vial as units per milligram. The output of the Glaxo penicillin plant at Barnard Castle is considerably over the high figure of 1,000 units per mgm. This penicillin, stored in a cool dry place retains full activity for 12 months.

PENICILLIN *Glaxo*
Dry sodium salt for injection in aqueous solution.

OILY INJECTION OF PENICILLIN B.P.
For intramuscular injection. 125,000 units per cc. of calcium salt in oil and beeswax.

PENICILLIN LOZENGES B.P.
For oral use Each lozenge contains 500 units of calcium penicillin.

Manufacturers of **PENICILLIN**

Details of packs and prices supplied on application.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

On
I cc.

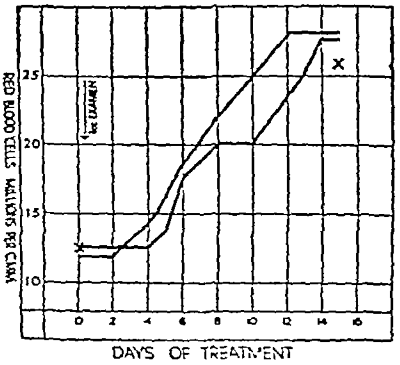
Every batch of 'Examen' fulfils in test the criterion of optimum response for one single injection of 1 cc. over 14 days.

This chart shows the required response to treatment for an initial red-cell level of 1 25 million. According to this criterion the final red-cell level must be at least 2 6 million (the crosses indicate the initial and final red-cell levels). The responses obtained in two test cases using 1 cc. of 'Examen' are shown by the continuous lines.

Thus 1 cc. every 14 days is the standard dose in treatment, and 1 cc. every 4 weeks the dose in maintenance.

**Lancet (1942) 2, 275 Brit. med J (1945) 1, 75.*

The two test cases are typical of many, and fully demonstrate the efficiency of 'Examen.'



PRODUCT OF THE GLAXO LABORATORIES

EXAMEN

Injectable liver extract

1 cc. boxes of 3 and 6: 5 cc. boxes of 1 and 5.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

but the positive side had been rather ignored. A man and woman were not individuals in a community but were members of a group. The yardstick of human optimism was the birth-rate. The marriage-rate was more than a measure of security; it was the index of the faith of the people in the future. The medical history of the war would record that the greatest contribution and greatest advance of boundaries had been made by psychiatry, both social and preventive.

Dr. A. S. PATERSON called for a card-index of sociological character, which would be most valuable in hospital work. He wanted to know the number of young men of high intelligence-quotient who had a sense of frustration because economic conditions prevented their early marriage. Frustration of parenthood might well lead to neuroses. Decay in family life had now spread to all classes. Psychiatry could help by paying more attention to the psychology of marriage and parenthood.

Reviews of Books

Injuries of the Knee Joint

I. S. SMILLIE, O.B.E., F.R.C.S.E., surgeon-in-charge, Larbert Orthopædic Hospital; director of orthopædic department, Falkirk and District Royal Infirmary. Edinburgh: E. & S. Livingstone. Pp. 320. *35s.*

IN this book Mr. Smillie has recorded with care and thought his experiences in treating knee-joint injuries in Service and civilian patients during his work at a large Scottish E.M.S. hospital throughout the war. If his manner seems a shade too elaborate for his matter, perhaps this is partly due to the unfamiliar lavishness of this peace-time production. His follow-up of end-results might have been fuller, and it might have been wiser not to advocate some of the operations for ligamentous reconstruction, which in other hands than his are unlikely to prove satisfactory. But because he has described with great honesty the problems he met and the methods he worked out to deal with them, and because the standard of illustration is high, this book must be of great value for those dealing with these common and disabling injuries for the first time.

Traitement orthopédique de la paralysie infantile

M. BOPPE, chirurgien des hôpitaux de Paris. Paris: Masson. Pp. 222. Frs. 140.

As Dr. Boppe says, "la poliomyélite est l'affection orthopédique par excellence," and every textbook of orthopædic surgery has a long chapter on it. Yet though these contain good descriptions of methods of treatment—remedial exercises, the fitting of apparatus, and various operations—the paralyses resulting from poliomyelitis are so irregularly distributed that every patient presents a new problem. In this work the orthopædic treatment of poliomyelitis as a whole has been successfully presented, and the reader will gain by reading it straight through, so as to get a bird's-eye view of the complexities.

The treatment of poliomyelitis during the recovery stage is perhaps dismissed rather too briefly, and the importance of attempting to assess muscle-power quantitatively (as recommended by the peripheral nerve injuries committee of the Medical Research Council) is overlooked. He gives the duration of the period of recovery as 3–5 years for the lower limb and 18 months for the upper, but does not distinguish between the progress made by a patient adequately treated from the first, and that made by one who gets no adequate physical treatment until many months after the acute illness. Nor does he discuss the degree of functional recovery between, say, the second and fourth years: is it usually sufficient to influence the surgeon considering the treatment of residual paralysis? In the experience of many surgeons the final stage of recovery *for all practical purposes* is reached by the end of the first year, provided the patient has been well treated throughout.

But three-quarters of the book is devoted to the treatment of established paralysis, and here Dr. Boppe gets into his stride. Each region of the body is discussed in detail and the merits of various mechanical devices and of operations—for the most part arthrodesis and tendon transplantation—are considered with commendable detachment. He is concerned less with boosting this or that method than with fitting the various techniques to the needs of the individual. There are timely warnings about some popular procedures: an artificial bone block at the ankle will cause a painful traumatic arthritis sooner or later, and transplantation of the peroneus longus will cause deformity of the foot from elevation of the first metatarsal—to mention only two examples. Arthrodesis of the hip is sometimes the best remedy for paralysis of muscles controlling the joint, but those about to do this operation should be sure to read his appraisal of it.

Dr. Boppe's own experiences are briefly and modestly described in the appropriate places, and where he lacks personal knowledge of a particular method he says so. Only once does he forsake the judicial attitude, to commend an operation of his own for drop-foot; and oddly enough this is the same as the one described by Lambrinudi in 1927. This is a striking example of his apparently patchy acquaintance with the literature of orthopædics, the bibliography being most disappointing. Nevertheless the merits of his book far outweigh his shortcomings.

Medical Aspects of Growing Old

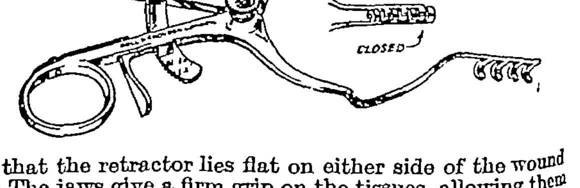
A. T. TODD, M.B. Edin., M.R.C.P., physician to the Bristol Royal Infirmary. Bristol: John Wright. Pp. 164. *15s.*

TITLE and format somewhat belie the content of this book. It looks like another of those neatly arranged compendia of medical knowledge, a poor objective in terrain still mostly unexplored; really it is a product of Dr. Todd's own bedside and test-tube observations enlivened by dietetic heresy and philosophic temperament. Longevity, he says, must be treated from childhood; dopes to get disease signs away afford no help, and he thinks Shaw in *Methuselah* may not have exaggerated the possibilities of old age. Youth is brilliant largely because the young have so few data to sort out and so many places in which to store new ones. About the fear of death he has a remarkably wise and sane word. It is for such sign-posts towards exploring instead of regretting that the book should appeal to the second of the three classes for whom Dr. Todd is writing: the elderly subject who desires to make the best of his later life. The practitioner will gain most from the vivid applications of physiology to the whole business of growing old; who else would have tested the superiority of a fat-low diet by setting the elderly to solve difficult crosswords? It is a book to skim in the first place and then keep for daily reference.

New Inventions

RETRACTOR FOR VARICOSE VEIN SURGERY

THE instrument illustrated is a modification of a self-retaining retractor used in other branches of surgery. The main points to be noted in this retractor are as follows: (1) It is so designed that it does not get in the way of the surgeon, the angle of the shaft being adjusted so that the retractor lies flat on either side of the wound. (2) The jaws give a firm grip on the tissues, allowing them to be lifted without slip. (3) The points of the teeth are so made that injury to neighbouring vessels should be avoided.



This retractor has been specially made for me by Mr. T. M. Proudfoot, M.B.E., of Messrs. John Bell & Croyden.

R. R. FOOTE, M.R.C.S., D.R.C.O.G.

THE LANCET

LONDON: SATURDAY, AUGUST 3, 1946

Decisions

ANOTHER phase in the progress of the National ealth Service Bill is behind us. A busy week saw e Bill pass through its report stage and its third ading. As these events almost coincided with the nual representative meeting of the British Medical ssociation, an attempt can now be made to -examine the attitude of Parliament and the profession.

In the House of Commons, Mr. BEVAN had little fficulty in satisfying his party that his proposals e right and proper. Whenever a division was hallenged, he was able to produce an effective majority—never less than a hundred—to endorse his olicy, and no amendment which he did not accept ad any hope of success. This is not to say, however, hat there have been no alterations since the second eading. Indeed, as Mr. WILLINK remarked in his final peech for the Opposition, the discussion in committee, lthough it did not persuade the MINISTER to depart t all from the principles on which he built his Bill, did lead to several important liberalising changes. Mr. WILLINK drew attention especially to the improvements in the position of the Central Health Services Council, the power of the hospital management committees to accept and use voluntary gifts, the decentralisation in selection of the doctor succeeding to a practice, and the new rôle of the Medical Practices Committee as a registrar of bona-fide transactions between doctors and hence as their protector against groundless prosecutions under clause 35. He might have added that any prosecutions which may still be undertaken will have to be heard by a jury, and that summary conviction by a magistrate can no longer happen. The right of admitting and treating patients in the private wards of hospitals, originally confined to specialists, is now extended to every doctor working in the public service. Clauses have been put into the Bill to remove any fear that anyone *serving on*, or employed by, regional boards, hospital management committees, or executive councils, might by so doing be deprived of civil rights, such as the right of election to Parliament.

All these improvements are of course welcome. Nevertheless, if only for the sake of the agreement which has still to be attained, we wish the MINISTER had found it possible to carry his concessions a little further. Of the points that might, we believe, have been conceded without material transgression of his principles, two have disproportionate psychological significance. In committee, the provision that any appeal from the decision of a tribunal should be to the MINISTER, alone, was taken out; but the victory was, as Mr. BEVAN said, pyrrhic: no alternative provision was inserted. Many hoped that on report he would agree that an appeal should lie to the High Court, but the former clause was reinserted, and the MINISTER himself will again be the final judge in any dispute. It had been widely pleaded, too, that a basic salary, while advantageous and unobjectionable where it is needed to attract extra doctors to uncongenial areas, or to help establish the new entrant to practice, is unnecessary as a moiety of every general practitioner's remuneration. Mr. BEVAN resisted in committee an amendment that would have restricted his ability to offer basic salaries solely to doctors in such categories as these. Yet if he had been willing to accept either, or preferably both, of these suggestions, the Bill would have been improved, and its opponents in the profession would have been deprived of arguments which can be used with great effect.

No very drastic changes in the Bill can be expected from its passage through the House of Lords, and as things now stand it was hardly surprising that the representative body of the B.M.A. should ask itself whether the time has not come when doctors should individually be given the chance of saying whether they will be willing to participate in the service which is to be set up under the Act. Opinion is divided—not on the wisdom of asking, but on the wisdom of asking now, when the full shape of the new service, as it will be revealed by the regulations, is still unknown. Some maintain that when a man has no clear picture of the conditions under which he will be asked to work it is unprofitable to ask him whether he will join in the service. Others say that the principles of the Bill and those enunciated by the Negotiating Committee are so plainly irreconcilable that, whatever the regulations, there can be no question of acceptance; hence they feel that delay in decision is unwarranted, and coöperation with the Government in framing regulations or in setting up the instruments of administration of the Act is positively dangerous. The representative body reached what is in the circumstances probably the best compromise. The suggestion now adopted is that a referendum shall be organised at an early date, but that the question asked shall not necessarily require an immediate and final answer on whether service is acceptable. Instead, each doctor will be invited to say whether he thinks the Negotiating Committee, if given its promised opportunity, should return to discussions at the Ministry of Health, and there do all it can to ensure that the regulations shall produce a workable service offering the fairest obtainable terms and conditions for the profession. Those who are certain that they could never take service under the present Bill, however attractive the conditions were made, will obviously regard any parleys on regulations as redundant, and so will vote against them. By so doing they will register their conviction that service under the Act must inevitably be refused. On the other hand, a vote in favour of a return to negotiation would not be final: it would be tantamount to reserving judgment on acceptance or refusal until the MINISTER's detailed intentions are revealed.

The B.M.A. has, we believe, shown sound judgment in focusing attention on what must be the crucial question of the coming months. We shall hope to see this question put to the profession as objectively, and as little tendentiously, as possible. If it is so put, the answer will tell us much more about the real wishes of the doctor-in-the-street, and the proportions in which the different views are held, than could be discovered from any delegate conference, however carefully convened.

'ALBUCID' SOLUBLE

BRAND OF SOLUBLE SULPHACETAMIDE

dissolves readily in water (up to 57%) and is unique among sulphonamides in that its solution can be easily adjusted to neutrality—hence it is non-irritating and innocuous to the tissues.

The low toxicity, high solubility and nearly neutral reaction of solutions make ALBUCID SOLUBLE ideal for local application. The following are some of the forms prepared for convenience of the medical profession.

'ALBUCID' SOLUBLE

Burn and Wound Dressing 6% · Eye Drops 10% and 30% · Eye Lotion Tablets 0·25 gm.
First Aid Dressing 6% · Eye Ointment 2½% and 6% · Dental Cerate 10%
Naso-Pharyngeal Solution 10% 'STERUCID' STERILE SOLUBLE POWDER AMPOULES 5 gm.

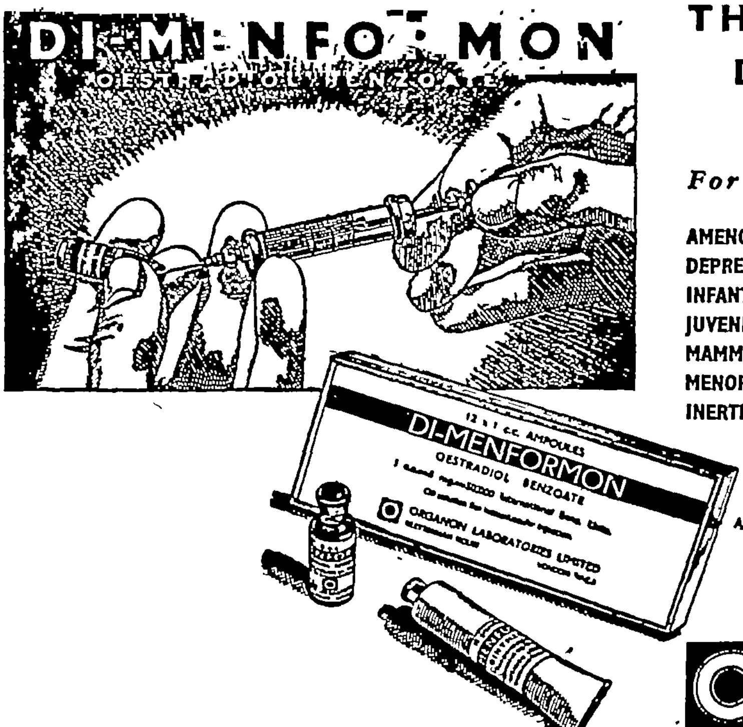
'ALBUCID' Oral Tablets 0·5 gm. 'STERUCID' STERILE POWDER AMPOULES 5 gm.

'DERMUCID' The new topical application containing 'Albucid' 6% in a vanishing cream base—particularly suitable for the treatment of impetigo, sycosis barbae and infected conditions of the face and other exposed parts; can be used without embarrassment to the patient.

'Albucid' is the registered name which distinguishes sulphacetamide of British Schering manufacture. *Samples and literature gladly sent on request*

BRITISH SCHERING LIMITED 167-169 Great Portland Street, London, W.1

3102



THE DEPENDABLE OESTROGEN

For injection or inunction

AMENORRHŒA · CLIMACTERIC SYNDROME AND DEPRESSION · DYSMENORRHŒA · ENDOMETRITIS INFANTILISM · INHIBITION OF LACTATION JUVENILE MENORRHAGIA . KRAUROSIS VULVAE MAMMARY UNDERDEVELOPMENT · MASTOPATHIA MENOPAUSAL ARTHRITIS · PRIMARY UTERINE INERTIA · STERILITY · UTERINE AND TUBAL HYPOPLASIA

AMPOULES AND VIALS 10,000 *AND* 50,000 *I.B.U./CC.*
OINTMENT 20,000 *I.B.U./GM.*

LITERATURE ON REQUEST.

ORGANON
BRETTENHAM HOUSE, LONDON, W.C.2

TELEPHONE: TEMPLE BAR 6785 *TELEGRAMS: MENFORMON, RAND, LONDON*

MON) it would be wiser to give therapeutic doses a week or less, or to use sulphonamide snuff. ch treatment will not eliminate the organism from e throat, and it remains to be seen whether negative ltures from throat as well as nose must be insisted if streptococcal infection is to be checked in scarlet-ver wards, schools, nurseries, and training camps. so, penicillin given for six or seven days seems eferable for controlling the spread of streptococcal fection in susceptible communities.

Diet and Structure in Dental Caries

THAT a rising incidence of dental caries has run ncurrently with progress in civilisation is an historical ct. That change in diet has played its part in this crease does not seem open to much doubt. But hether the change in diet has acted directly by producing conditions in the mouth favourable to the owth of organisms responsible for attack on the iamel, or indirectly by interfering with efficient rmation of the enamel and thus rendering the tooth ore liable to attack, has caused much controversy. he actual mechanism of attack is not yet fully nderstood. MILLER's well-known theory that carbo-ydrate breakdown produces lactic acid which issolves the enamel does not fit all the known facts. Iore recently PINCUS has suggested that proteolytic rganisms may inaugurate the attack by producing issolution of the organic matrix of the enamel and hus causing the inorganic prisms to fall apart. There is vidence that some anaerobic proteolytic organisms are apable of causing lysis of the organic matrix in vitro; his requires further investigation. M. MELLANBY's vork on dogs showed that deprivation of vitamin D esulted in hypoplasia of the enamel, and this brought nto prominence the possible significance of the tructure of the tooth in influencing the incidence nd severity of caries. It was a common observation mong dental surgeons that the gross structure of the ooth was an important factor in caries production, nd teeth showing deep fissures were known to be more iable to attack. The vitamin conception, however, vas a new one, and it was suggested that minor degrees of hypoplasia of the enamel due to vitamin-D deficiency in the human formed the weak points through which attack took place. It remained to be explained why in gross hypoplasia of the enamel due to hereditary or acute zymotic causes, where the teeth are reduced to mere pegs of dentine externally, caries is less in evidence than in normal teeth.

Numerous large-scale experiments among schoolchildren have been undertaken to evaluate the addition of extra vitamin D to the diet, but these have not been very conclusive. The incidence of dental caries is equally low among Eskimos eating largely meat and fat and among African tribes eating quantities of sugar-cane, and various attempts have been made to estimate the value of unrefined foods in the diet as distinct from the refined and cooked foods more generally used under prevailing civilised conditions. The "Oslo breakfast" originated from experiments along these lines, and results in children did seem to show that dental caries was less common among those eating unrefined foodstuffs. Whether this was a direct effect or an indirect one due to improvement of enamel structure was still not entirely clear.

The data set out by Sir FRANK COLYER in the first of the Charles Tomes lectures on Dental Disease in Animals[1] are highly relevant to the human problem. In an extensive survey of the incidence of dental caries and parodontal disease in wild and captive animals it has been shown that caries is far more common in captive animals whose diet has changed from that of the wild state, and that the mode of onset of caries is also altered. In the anthropoid apes, for example, in the wild state the carious process is found only where the dentine or the cementum of the root has been bared by attrition or food packing. It never starts in the enamel and is far more common in the incisors than in the molars (103 to 3), probably because of the greater wear on the incisors. The same general findings, with slight variations in prevalence and distribution, have been obtained in both Old and New World monkeys, though caries is rather less in evidence among those from the New World. It is interesting that the disease seems to be more prevalent among monkeys from certain districts. From these investigations it is clear that dental caries in apes and monkeys only occurs where food is liable to stagnate; in the wild animal it starts, with very few exceptions, in the dentine or cementum, leaving the enamel untouched, whereas in the captive animal it starts in the enamel. The same general freedom from caries in the wild state, and high incidence in captivity, has been observed in the ungulates, rodents, and carnivores. These observations raise the question whether the comparative immunity of wild animals is due to some peculiarity in the structure of their teeth and whether the enamel of the wild animal is more perfectly formed than in the human. Prof. EVELYN SPRAWSON, at Sir FRANK COLYER's request, examined the enamel of 280 wild animals of 60 species, including apes, monkeys, carnivores, and rodents, and compared the structure with that of human enamel. He concluded that on the average the enamel of wild animals is of poorer quality than human enamel in respect of density and completeness of calcification.

The inference from this work is clear. Of recent years much effort has been directed towards improving the structure of the teeth, particularly of the enamel, on the hypothesis that the better the structure the lower the incidence of dental caries. If this structure is already better in human beings than in wild animals, which seem to be almost free from the disease until subjected to artificial alteration of their diet, we must look elsewhere for the origin of caries, though the animal evidence still points to the artificial "civilised" diet as the main factor underlying the causation of the caries. This view finds support in the Norwegian observations summarised in these columns last week.[2] In Norway the falling incidence of caries has been ascribed in some quarters to the monotonous diet of war-time. Be that as it may, we are certainly not prepared to return to a diet of fruit and leaves now, when most of us are hoping soon to indulge once more in the sticky and glutinous messes which delight our sophisticated palates. Further research is needed; and perhaps it is the mechanics and chemistry of food in relation to the teeth, rather than the structure of the teeth themselves, that should be considered first.

---

1. Delivered at the Royal College of Surgeons, Lincoln's Inn Fields, on July 11.
2. See *Lancet*, July 27, 1946, p. 129.

Streptococcal Throat Infections

SCARLET FEVER is today so mild that special therapeutic measures seem unnecessary. Commercially prepared antitoxin is used to a fair extent in this country, partly as an antidote to the initial toxæmia but more because of its effect in reducing desquamation and so facilitating early discharge of the patient from hospital or from isolation at home. In America convalescent serum has been preferred, but, as a recent study[1] shows, it is probably less effective than the commercial antitoxin.

The trouble with scarlet fever is not the severity of the *initial infection* but the risk of complications like otitis media, adenitis, and scarlatinal relapse among patients nursed in open hospital wards. These complications are mostly attributable to cross-infection with streptococcal types harboured by other patients or present in the dust of the ward. The control of such cross-infection may be attempted either by *eliminating the reservoir* or by *blocking the channels* of spread, and the first of these procedures has obvious advantages if it is practicable. Sulphonamides, *administered* locally in the *form* of lozenges or systemically, usually fail to eliminate hæmolytic streptococci from the throat, though the numbers may be temporarily reduced during treatment. The advent of penicillin promised more success, but again local therapy with sprays, lozenges, and the like has been disappointing. With more plentiful supplies systemic therapy has now been given a trial, and the results suggest that it will eliminate hæmolytic streptococci from the throat either temporarily or *permanently according to the duration of treatment*. Thus, in one investigation[2] of 118 cases of scarlet fever, mostly infected with sulphonamide-resistant streptococci, a total dosage of 240,000 units, given in 10,000-unit doses three-hourly for three days, temporarily eliminated the organism in practically all cases, but the percentage of positive throat cultures was higher after treatment than before treatment was begun; on the other hand, in a group given 480,000 units over eight days (10,000 units three-hourly for four days and 10,000 units six-hourly for four days) only 8% had positive throat cultures after treatment compared with 85% at onset. The incidence of complications after the short course was 31% and after the long course 6%. The immediate clinical response in all cases was good. In another trial[3] of systemic penicillin in the treatment of streptococcal tonsillitis and pharyngitis, *alternate* cases were given 20,000 units of penicillin every four hours for three days, and if the patient still had positive throat cultures at the end of a week another course of 360,000 units was given. The criteria of streptococcal infection were positive throat cultures and a significant rise in antistreptolysin titre during convalescence. Clinically the most obvious effect of penicillin therapy was a reduction in the duration of pyrexia from five days in the control group to three days in the treated group. The rate of disappearance of exudate and inflammation was similar in the two groups. Of 59 treated patients, 20 had positive throat cultures a week after the beginning of treatment, and 11 of these developed clinical exacerbations, whereas only 4 of the culturally negative cases showed a recrudescence symptoms. At the end of a month 6 of the 59 treate cases (including the 20 cases given a second course penicillin) had positive throat cultures, compar with about half the control cases. However, comp *cations were equally frequent in the two groups* Th conclusion drawn was that a six-day course of penicill is needed to eliminate the organism from the throat most patients. In view of the disadvantages t patients and staff of three-hourly intramuscula injections for a week, oral therapy (180,000 uni daily in six doses) was tried in 20 patients for days and the clinical and bacteriological results w almost as good as with parenteral administration

Another approach has been adopted by HAMBUR and LEMON.[4] Earlier studies had indicated t heavy nasal carriers of hæmolytic streptococci w the important reservoirs from which infection disseminated in hospital or barracks,[5] so it seem logical to try to eliminate these reservoirs. Propl lactic doses of sulphonamides had apparently be successful in cutting short outbreaks of streptococ infection, and this effect might reasonably be att buted to cure of the nasal carriers. A group of 26 na carriers, all acute cases in hospital, were theref *treated with 1 g. of sulphadiazine daily for five to* days. Using different quantitative methods of cult from the nose, the American workers found a signific reduction in the organisms expelled by 22 of the carriers, and in fact the ordinary nasal swab cult became negative in most of the cases within two five days. Of the 4 non-responding patients, carried sulphonamide-resistant streptococci, 1 h inadequate sulphonamide blood levels, and the fou had maxillary sinusitis. Hæmolytic streptococci w *demonstrable in the nose cultures, usually in* sm numbers, in 95% of the cases after treatment, and most instances the throat cultures remained positi throughout. Sulphadiazine was also given to group of ambulatory cases in daily doses of 1 g. thirty-two days; of 29 carriers of sulphonamid sensitive streptococci, 26 responded rapidly, where only 1 of 6 carriers of sulphonamide-resistant strep cocci became negative. In another group of ambula cases a five-day course temporarily eliminated t *organism from the nose in two-thirds* of the case but nearly all relapsed afterwards, compared wi only a quarter of those given the longer course. further small group of 14 nasal carriers—7 acutely and 7 ambulant—were each given a daily injection 300,000 units of penicillin in beeswax oil for five seven days. In every case there was rapid eliminati of the *organism*, and 7 of the 14 *remained* free fro infection in follow-up periods of eleven to seventy-tw days. Of the remainder, only 2 relapsed as hea nasal carriers.

Small doses of a sulphonamide given for sever weeks involve the risk of inducing drug-fastness the infecting organism and of sensitising the patien If the nasal carrier responds to sulphonamide thera (the results reported by RENTZ and his colleagues do not substantiate the claims of HAMBURGER a statutory duty to aid such patients, but of late years ne of them have encouraged suitable patients to enter spital voluntarily by giving them aid from the rates; d on Jan. 1, 1946, of 2081 voluntary patients in Scotnd, 374 were rate-aided. That good use is made of e provision for voluntary treatment is evident from the ct that, in 1945, out of 4132 admissions to mental spitals 1945—nearly half—were voluntary. As the w stands, no-one can be admitted as a voluntary patient his mental condition is such that certificates of insanity uld legally be granted in his case. In practice, it seems, is requirement is not always met, patients sometimes ing admitted on a voluntary footing even when they ight legally be certified. To get over the difficulty, the mmittee recommend that this part of the law should e redrafted on the lines of the English Mental Treatment ct of 1930. Prof. D. K. Henderson dissents from this n the ground that. in Scotland, once a patient has ntered a mental hospital voluntarily it has been cusomary to let him remain there on that basis regardless f the progress of his illness; and that this has proved eneficent. Merely to accept the English pattern, he inks, "would convey a very limited benefit to our atients, and much confusion and irritation to those who ere responsible for administering the Act." Certainly any with experience of the English Act would feel that, hough it safeguards some of the patient's interests, it isregards others. The committee were unanimous, owever, in emphasising that, as far as possible, comulsory detention should be applied only where the atient is unable or unwilling to give his consent to reatment. This granted, they hold that procedure or the admission of people to mental hospitals needs implifying.

---

[1] Ashley, P. *J. Amer. med. Ass.* 1946, 130, 771.

[2] Epidemiology Unit no. 82, U.S. Naval Medical Service. *Amer. J. med. Sci.* 1946, 211, 417.

[3] Keith, J. D., MacLennan, J., Williamson, J., Carpenter, J., Armstrong, C. *Canad. med. Ass. J.* 1945, 53, 471.

[4] Hamburger, M. jun., Lemon, H. M. *J. Amer. med. Ass.* 19 130, 836.

[5] See *Lancet*, 1946, i, 166.

[6] Rentz, L. A., Spink, W. W., Boissert, P. J. *Bull. U.S. Ar Med. Dept.* 1946, 5, 662.

In their study of the mental-deficiency laws the ommittee rejected the suggestion that mental deficiency, ike lunacy, should be made a plea in bar of trial. Proessor Henderson, who seems to have had trouble in ersuading his fellow committee-members to share some f his views (he is responsible for all five reservations to he report, being joined in the last by Lord Provost John Phin), again dissented, arguing that, owing to their deficiency, mental defectives are not so well able to control their thought and actions as the better endowed, and in fact never have a normal appreciation and understanding of the disordered act. When an accused person can be unequivocally classed as a mental defective, of whatever grade, Professor Henderson holds that a plea in bar of trial should be sustained—a view which many of his medical colleagues will share. The committee concede that where mental defect is proved it should be a bar to a punitive sentence; and that any mental defective committing a criminal offence should be sent not to prison but to an institution. They recommend that a new State institution should be built for mental defectives of a criminal or violent type, and that a central index of mental defectives should be set up, so as to ensure that no mental defective is sent to prison. For adolescents showing unstable behaviour, "whose mental capacity and conduct touch only the fringe of insanity or mental defectiveness or criminality," new legal provisions are recommended, to bring them under training or supervision in a colony or institution in which they will be studied and treated medically and psychologically, with a view to helping them to become useful citizens.

The committee are anxious to see mental health divorced from the scope of the poor-law. The provisions for dealing with dangerous lunatics are in the 1862 Act, and authorise a procurator-fiscal or an inspector of the poor (now a public-assistance or welfare officer) to apply to the sheriff for appropriate action in the interests of the public, and the sheriff may then commit the patient to a mental hospital to be detained until cured or until "caution shall be found for his safe custody." These provisions are not limited to pauper lunatics, but are applied to any person found by the sheriff, on inquiry, to be insane and dangerous, even though he is not receiving parish relief or otherwise coming within the definition of a pauper. No such stigma attaches to the person who needs help on account of physical illness, and it seems likely that this provision, perpetuating the association of mental illness with the poor-law, has often caused delay in treatment of the patient, the relatives naturally being reluctant to have him classed as a pauper lunatic. The committee recommend that mental health should be removed entirely from the scope of the poor-law, and that lunatic wards of poorhouses should be closed down as soon as accommodation in mental hospitals can be sufficiently increased.

Professor Henderson dissenting, the committee decided that a study of the position of the mental-health service under the National Health Service scheme was not covered by their remit, but they express a hope that future administration will safeguard the interests of mental health and mental patients, and that there will be a special department of the central health authority to deal with them.

MEDICAL CARTOGRAPHY

THE value of the familiar spot maps that commonly decorate the walls of administrative health offices depends largely on the efficiency of the methods of disease notification and collection and correlation of data. The unreliability of the human factor, in diagnosis for example, must also be respected. Thus, in the M.E.F. during the war, as soon as sandfly fever was declared a notifiable disease its "incidence" fell dramatically, but many more cases of "coryza" were diagnosed. Nevertheless, the American Geographical Society believes that when a geographer rather than a medical man brings his endeavours to bear on medical maps he can show that the influence of environment holds the key to understanding or control of at least some human diseases. The society proposes [1] to produce an atlas of diseases; and a geographical analysis of the distribution of fluorine in the water-supplies of the United States has already been undertaken.[2] This subject has been selected because of the relationship of dental health to the fluorine content of drinking-water, and the growing public interest in its importance. Outstanding work on this relationship has been done in the U.S.A. by H. T. Dean, and he has been chosen as consultant for the investigations necessary to the production of the atlas. The maximum fluorine content known for each county forms the basis of the map and on this has been plotted, as a regional pattern, the distribution of fluorine by joining values of stated fluorine concentrations by isolines. The sanitary engineers, health officers, and geologists of every State are said to have coöperated nobly by collecting and providing statistical information, but the difficulties of the undertaking were still weighty. Incompleteness of data was one of the major problems. For example, before 1932 no attention was given to the fluorine content of water-supplies in the U.S.A., and even today the fluorine test is not universal in water analysis. Again, the fluorine concentration in water fluctuates widely during the year; other factors required for mapping are also subject to local variations—e.g., depth of wells and nature of rock strata. The map gives no information on the nature of individual water-supplies and the number of people affected by them. Thus, the map is not free from defects as an instrument of scientific research and a practical expedient in epidemiological studies.

The American Geographical Society has further chosen ten diseases for representation in the new atlas:

---

1. Light, R. U. *Geogr. Rev.* 1944, 34, 656.
2. van Burkalow, A. *Ibid*, 1946, 36, 177.

Annotations

THE CAPITATION FEE

LONG before the war panel practitioners repeatedly asked for an increase in the capitation fees paid under National Health Insurance. Their carefully prepared case was shelved in 1939, but the necessity for reassessment of the fee has never been forgotten. During the war the payment for each insured person was increased from 9s. to 10s. 6d., but much of this increase was to allow for the higher expenses of practice, and some of it, the recipients were told, was meant to compensate for the inclusion (without prior consultation) of the £250–£420 income-group in the health insurance range. The increase is widely felt to be trivial, indeed non-existent in view of the change in the value of money since 1939, and many practitioners are working under a strong sense of injustice. Latterly, when the Insurance Acts Committee voiced this feeling, it was told that nothing could be done until the Spens Committee reported. On the appearance of the report, therefore, a new approach was made to the Ministry; and the resulting correspondence between the Minister and the I.A.C. has now been published.

Apparently an impasse arose early because the Minister, not unnaturally, wished to discuss at the same time the remuneration to be offered to practitioners in the National Health Service which will supersede National Health Insurance in April, 1948. This the I.A.C. refused, having neither the mandate, nor the inclination, to consider the more permanent arrangements. One of the reasons for its attitude was no doubt that the Minister's plans for medical remuneration (as set out in the white-paper on the Bill) include basic salaries and variable capitation fees—proposals which are foreign to present insurance practice and are probably unwelcome to the majority of the profession. But even though the I.A.C. has been unable to secure the limited negotiations which it sought, it has at least won an important pronouncement from Mr. Bevan, which he had hitherto refused to make, despite repeated demands in Parliament. It has obtained a firm statement of his views on the Spens report: "the Minister desires to make his attitude to that report quite clear. He fully accepts the substance of the recommendations of the committee in their majority report." This statement means in effect that the figure for capitation fees in the new service will be based not on an adjustment of past capitation fees but on the range of incomes suggested by the majority of the Spens Committee—translated into post-war money.

Meanwhile the Minister has also, by accepting the Spens verdict, tacitly agreed that panel doctors have been, and are being, inadequately paid. Having failed to secure the general discussions which he on his side wanted, he offers, for this intermediate period, what is no doubt a smaller sum than negotiations would have obtained: he is willing to pay an extra 2s., making a total capitation fee of 12s. 6d., from Jan. 1 of this year. To this the I.A.C. replies that 12s. 6d. is "gravely inadequate." It says that it would be willing to recommend acceptance of an interim fee of 15s.; or, if the Minister prefers, would accept arbitration by the Spens Committee, whom it now suggests "should be asked to state the implications of its majority report in relation to the current insurance capitation fee."

There at the moment the matter stands, awaiting the Minister's reply. It will be a pity if no acceptable solution can be found, either by negotiation or some form of arbitration. The preparations for a new era in medicine ought not to be marred by the persistence of the sense of frustration and injustice engendered by unsatisfactory handling of the problems of an old and passing day.

RADIO-ACTIVE IODINE IN TOXIC GOITRE

IODINE was one of the first elements to be made radio-active artificially (in 1934), and for some years experiments have been in progress in the U.S.A. to determine its effects on the thyroid. It is known now that in a patient not under the influence of iodine 80% of a dose of radio-active iodine is taken up in the thyroid within a short time of ingestion. It there gives off rays which generate high-speed electrons, and these affect neighbouring tissues to a distance of a few millimetres. This effect is the same as that ultimately produced by X rays, but the internal radiation has two advantages in that it does not have to penetrate the skin and other overlying tissues, and that it is probably distributed evenly throughout the gland. Theoretically therefore radio-active iodine should produce better results in toxic goitre than X-ray therapy, which in the opinion of most clinicians has not been a success, and this is verified by recent clinical reports.[1] The radio-active iodine is taken by mouth within a few hours of its preparation, as an almos tasteless liquid. Occasionally there are slight toxi effects, including pyrexia and nausea for a day or two The patient must have taken no iodine for several week previously.

Of the 51 cases reported in the two papers it is claime that four-fifths were restored to normal, the basa metabolic rate falling to normal in one to five months and the gland shrinking in many cases to normal size Fibrosis is produced in the gland by this method, as show by biopsy. In 9 cases hypothyroidism or myxœdem resulted, though in 5 this occurred only after a subsequen thyroidectomy, and in 2 of the others the B.M.R. ros spontaneously to low normal levels. The dose of radio active iodine is calculated in millicuries, and the strengt required is proportional to the size of the goitre. Mos of the patients required only a single dose, but other required two or three. These results are so good tha many British workers will hope that radio-active iodin will soon be available here so that they can confirm the The method has the advantage, from the patient's poin of view, of extreme simplicity, and apart from th possibility of myxœdema it seems to be free from risk.

MENTAL ILLNESS AND SCOTTISH LAW

EARLY treatment offers the best hope of cure in man conditions, but is nowadays of special importance i mental illness, since many modern therapies give thei best results only in the early stages. The laws devise in the past to guard the patient's interest may no sometimes prove a handicap to him if they deter hi friends from seeking proper treatment for him at th outset. In Scotland, laws concerning the mentally i and defective are contained in a series of Acts, the mos important being the Lunacy Act of 1857, the Amendmen Acts of 1862 and 1866, and the Mental Deficiency an Lunacy Act of 1913. The committee, under the chai manship of Lord Russell, of the Scottish Court of Session appointed in 1938 by the Secretary of State for Scotlan to inquire into these laws, have now published thei report[3]; and they lay great weight on possible cause of delay. Voluntary desire for treatment has bee recognised as important in Scotland ever since 1857, whe the Royal Lunacy Commission recommended statutor provision for voluntary patients. Local authorities hav

---

1. Hertz, S., Roberts, A. *J. Amer. med. Ass.* 1946, 131, 81 Chapman, E. M., Evans, R. D. *Ibid*, p. 86.
2. The committee was constituted as follows: Lord Russel chairman; the Hon. Mrs J. E. Hamilton; Prof. D. K Henderson, F.R.C.P.E.; Sir James Irvine, F.R.S. (resigne 1938); Mr. William Leonard, M.P.; Sir Basil Neven-Spenc F.R.C.P.E., M.P.; Mr. W. D. Patrick, K.C.; Lord Provo John Phin; Bailie Violet Roberton; Prof. T. M. Tayl (resigned 1944); Dr. A. G. W. Thomson; Mr. George Andre The secretary was Mr. J. A. W. Stone.
3. Report of the Committee on the Scottish Lunacy and Ment Deficiency Laws. Department of Health for Scotland. Edi burgh: H.M. Stationery Office. Pp. 131. 2s.

no statutory duty to aid such patients, but of late years ome of them have encouraged suitable patients to enter hospital voluntarily by giving them aid from the rates; and on Jan. 1, 1946, of 2081 voluntary patients in Scotland, 374 were rate-aided. That good use is made of the provision for voluntary treatment is evident from the fact that, in 1945, out of 4132 admissions to mental hospitals 1945—nearly half—were voluntary. As the law stands, no-one can be admitted as a voluntary patient if his mental condition is such that certificates of insanity could legally be granted in his case. In practice, it seems, this requirement is not always met, patients sometimes being admitted on a voluntary footing even when they might legally be certified. To get over the difficulty, the committee recommend that this part of the law should be redrafted on the lines of the English Mental Treatment Act of 1930. Prof. D. K. Henderson dissents from this on the ground that, in Scotland, once a patient has entered a mental hospital voluntarily it has been customary to let him remain there on that basis regardless of the progress of his illness; and that this has proved beneficent. Merely to accept the English pattern, he thinks, "would convey a very limited benefit to our patients, and much confusion and irritation to those who were responsible for administering the Act." Certainly many with experience of the English Act would feel that, though it safeguards some of the patient's interests, it disregards others. The committee were unanimous, however, in emphasising that, as far as possible, compulsory detention should be applied only where the patient is unable or unwilling to give his consent to treatment. This granted, they hold that procedure for the admission of people to mental hospitals needs simplifying.

In their study of the mental-deficiency laws the committee rejected the suggestion that mental deficiency, like lunacy, should be made a plea in bar of trial. Professor Henderson, who seems to have had trouble in persuading his fellow committee-members to share some of his views (he is responsible for all five reservations to the report, being joined in the last by Lord Provost John Phin), again dissented, arguing that, owing to their deficiency, mental defectives are not so well able to control their thought and actions as the better endowed, and in fact never have a normal appreciation and understanding of the disordered act. When an accused person can be unequivocally classed as a mental defective, of whatever grade, Professor Henderson holds that a plea in bar of trial should be sustained—a view which many of his medical colleagues will share. The committee concede that where mental defect is proved it should be a bar to a punitive sentence; and that any mental defective committing a criminal offence should be sent not to prison but to an institution. They recommend that a new State institution should be built for mental defectives of a criminal or violent type, and that a central index of mental defectives should be set up, so as to ensure that no mental defective is sent to prison. For adolescents showing unstable behaviour, "whose mental capacity and conduct touch only the fringe of insanity or mental defectiveness or criminality," new legal provisions are recommended, to bring them under training or supervision in a colony or institution in which they will be studied and treated medically and psychologically, with a view to helping them to become useful citizens.

The committee are anxious to see mental health divorced from the scope of the poor-law. The provisions for dealing with dangerous lunatics are in the 1862 Act, and authorise a procurator-fiscal or an inspector of the poor (now a public-assistance or welfare officer) to apply to the sheriff for appropriate action in the interests of the public, and the sheriff may then commit the patient to a mental hospital to be detained until cured or until "caution shall be found for his safe custody." These provisions are not limited to pauper lunatics, but are applied to any person found by the sheriff, on inquiry, to be insane and dangerous, even though he is not receiving parish relief or otherwise coming within the definition of a pauper. No such stigma attaches to the person who needs help on account of physical illness, and it seems likely that this provision, perpetuating the association of mental illness with the poor-law, has often caused delay in treatment of the patient, the relatives naturally being reluctant to have him classed as a pauper lunatic. The committee recommend that mental health should be removed entirely from the scope of the poor-law, and that lunatic wards of poorhouses should be closed down as soon as accommodation in mental hospitals can be sufficiently increased.

Professor Henderson dissenting, the committee decided that a study of the position of the mental-health service under the National Health Service scheme was not covered by their remit, but they express a hope that future administration will safeguard the interests of mental health and mental patients, and that there will be a special department of the central health authority to deal with them.

MEDICAL CARTOGRAPHY

THE value of the familiar spot maps that commonly decorate the walls of administrative health offices depends largely on the efficiency of the methods of disease notification and collection and correlation of data. The unreliability of the human factor, in diagnosis for example, must also be respected. Thus, in the M.E.F. during the war, as soon as sandfly fever was declared a notifiable disease its "incidence" fell dramatically, but many more cases of "coryza" were diagnosed. Nevertheless, the American Geographical Society believes that when a geographer rather than a medical man brings his endeavours to bear on medical maps he can show that the influence of environment holds the key to understanding or control of at least some human diseases. The society proposes[1] to produce an atlas of diseases; and a geographical analysis of the distribution of fluorine in the water-supplies of the United States has already been undertaken.[2] This subject has been selected because of the relationship of dental health to the fluorine content of drinking-water, and the growing public interest in its importance. Outstanding work on this relationship has been done in the U.S.A. by H. T. Dean, and he has been chosen as consultant for the investigations necessary to the production of the atlas. The maximum fluorine content known for each county forms the basis of the map and on this has been plotted, as a regional pattern, the distribution of fluorine by joining values of stated fluorine concentrations by isolines. The sanitary engineers, health officers, and geologists of every State are said to have coöperated nobly by collecting and providing statistical information, but the difficulties of the undertaking were still weighty. Incompleteness of data was one of the major problems. For example, before 1932 no attention was given to the fluorine content of water-supplies in the U.S.A., and even today the fluorine test is not universal in water analysis. Again, the fluorine concentration in water fluctuates widely during the year; other factors required for mapping are also subject to local variations—e.g., depth of wells and nature of rock strata. The map gives no information on the nature of individual water-supplies and the number of people affected by them. Thus, the map is not free from defects as an instrument of scientific research and a practical expedient in epidemiological studies.

The American Geographical Society has further chosen ten diseases for representation in the new atlas:

---

1. Light, R. U. *Geogr. Rev.* 1944, 34, 636.
2. van Burkalow, A. *Ibid.* 1946, 36, 177.

cholera, the typhus group, malaria, yellow fever, goitre, plague, beriberi and pellagra, filariasis, elephantiasis, and schistosomiasis. It will certainly be a useful act to review the distribution of these conditions. During the war years the contact of large groups of men from military necessity, malaria prophylaxis, immunisation, mass acclimatisation to unaccustomed conditions, deficiency disease in prison camps, and the effects of air travel on the spread of disease have combined to produce drastic changes in the incidence of disease. One may hope that in time the atlas will be extended to include not only the U.S.A. but the whole world, serving as a tool of research rather than a textbook. An attempt to prepare a global epidemiology[3] has already been begun elsewhere for the Medical Department of the U.S. Army, though in a less graphic manner and based on a correlation of local geography and climate, public health, medical facilities, and diseases. It will be interesting to compare this survey with the proposed atlas of diseases.

PASTEURISATION AND CHILD HEALTH

THE small party sent out to North America two years ago to see the methods of production and marketing of milk in the United States and Canada[4] emphasise the fact that pasteurisation is almost universal in North America; and the importance of this practice to child health has been brought out very clearly by Lethem,[5] who summarises the mortality from abdominal bovine tuberculosis in England and Wales during the period 1921–44, as follows (actual number of deaths in parentheses):

DEATH-RATES FROM ABDOMINAL TUBERCULOSIS PER MILLION CHILDREN UNDER 5 YEARS OF AGE LIVING IN EACH AREA

—	1921	1930	1938	1944
London administrative county . .	136 (51)	24 (8)	12 (3)	6 (1)
Combined county boroughs . .	437 (490)	157 (160)	63 (57)	35 (32)
Combined urban districts . .	366 (390)	134 (139)	77 (66)	42 (42)
Combined rural districts . .	252 (176)	92 (57)	63 (31)	60 (37)

Abdominal tuberculosis in young children, which is predominantly bovine in origin, gives in its incidence-rate a better indication of the trend of the risk of milk-borne infection than any other clinical type of tuberculosis. The table shows that the most dramatic decline in abdominal tuberculosis has been in the London County Council area, though a slighter decline has also occurred in other districts. These trends can be correlated with the completeness of pasteurisation in each of the areas. Of the milk supplied in 1938, in London 98% was pasteurised, compared with only 60% in the county boroughs, while the consumption of raw milk was greatest in the rural districts. Despite the dangers inherent in "bulking" milk-supplies, and the environmental disadvantages of city life, the death-rate in London had declined by 1944 to a twenty-third of the 1921 figure, whereas in the rural districts the rate had fallen to a quarter of what it was in 1921. The death-rate in London in 1944 was a tenth of that in the rural districts. It would be unwise to assume from these figures, suggestive as they are, that pasteurisation alone was responsible for the happy state of affairs. Its effects must be considered in relation to all the improvements in environmental conditions which have brought about the consistent decline in tuberculosis mortality since 1920. Nevertheless there is little doubt that pasteurisation has been a major factor in the prevention of bovine tuberculous infection in children. In the recent House of Lords discussion of dairy-farming, the usual arguments about the deleterious effects of pasteurisation were raised, but no figures comparable in scope and conviction with Lethem's data were produced in substantiation. Unless and until better statistical evidence to the contrary is produced, we should do well to act on the implications of his findings. The mission's report on milk-marketing methods in North America has covered the practical details. It remains for administrators to put these recommendations into effect, for the country cannot afford the wastage of child life entailed by too sensitive a regard for the prejudices of part of the farming community.

THE INDEX-CATALOGUE

THIS summer the United States Army Medical Library at Washington (more familiarly known as the Surgeon-General's) has sent over the recent volumes of its famous *Index-Catalogue* to bring up to date the sets in British medical libraries. These volumes had been held in store since the whole British consignment of 1941 was sunk in the Battle of the Atlantic. Their arrival recalls the debt we owe to the compilers and producers of the *Index-Catalogue* and ultimately to the United States Congress, who pay for its printing and free distribution throughout the world.

The catalogue was launched with vision and enterprise by Dr. John S. Billings 66 years ago, and Billings truly said that it would "be useful in St. Petersburg, for example, as well as in Washington, its measure of utility in any locality being the extent of the collection of medical literature therein." It has now reached its 56th volume and is half-way through the alphabetical arrangement for the fourth time, having listed 2,500,000 articles and 400,000 books under their subjects, besides half a million entries under authors' names. The distribution list, published for the first time in the 1943 volume, shows that 800 of the 1000 copies printed are given away by the American government, no less than 69 copies coming to the British Isles, for libraries and other medical institutions. The visitor to a medical library in any country will always be shown the position of the *Index-Catalogue*, often with the grateful remark "They index our collections for us," though naturally it is of greatest value to English-speaking people. Without this subject index the medical reader would have to make a tedious search through the volumes of the *Index Medicus*, each of which covers only six months' output, and for the earlier publications he would have to wade through the long series of the periodicals themselves.

Criticisms of the *Index-Catalogue* have of course been heard, for no work of such a scope can be perfect. And it has been admitted that the library lived on its past reputation through the slump of fifteen years ago, while the catalogue fell below its own high standard of comprehensiveness. But under the wise and enthusiastic rule of Colonel Harold W. Jones, who has lately retired after nine years as librarian of the world's greatest medical library, both library and catalogue have been imbued with new life. The catalogue is in the able hands of Dr. Claudius F. Mayer, a distinguished medical scholar. The new connexion between the U.S. Army Medical Library and the Library of Congress, and the correlation of the *Index-Catalogue* with the American Medical Association's *Quarterly Cumulative Index Medicus*, will ensure the maintenance of accuracy and inclusiveness. Everyone who seriously follows medical writings will acknowledge his deep debt to the famous reference work which Dr. William H. Welch called America's greatest contribution to medicine.

MR. WILLIAM GEMMILL, professor of surgery in the University of Birmingham and surgeon to the Queen Elizabeth and General Hospitals, Birmingham, died at his home at Edgbaston on July 28.

---

3. Simmons, J. S., Whayne, T. F., Anderson, G. W., Horack, H. M. Global Epidemiology, Philadelphia and London, 1944.
4. Milk in North America. H.M. Stationery Office. 1946. See *Lancet*, July 27, p. 127.
5. Lethem, W. A. *Mon. Bull. Min. Hlth & E.P.H.L.S.* April, 1946.

Special Articles

BRITISH MEDICAL ASSOCIATION

ANNUAL REPRESENTATIVE MEETING

MEETING in London from July 23 to 25, with Dr. J. B. MILLER in the chair, the B.M.A. representative body heard a statement from Dr. GUY DAIN, chairman of council, on negotiations with the Minister of Health on the National Health Service Bill.

The B.M.A. and the Bill

The Minister, said Dr. Dain, had adopted Mr. Willink's plan almost in its entirety, but had added nationalisation; he had refused to negotiate on the principles of the Bill—namely, State ownership of hospitals, direction, the abolition of sale and purchase of practices, and part-payment by salary. In Dr. Dain's opinion, none of these additions would improve the service to patients, and none of them was necessary; they simply carried out the ideals of the Socialist party.

The ownership of hospitals had not been contested by the hospitals themselves as hotly as might have been expected. There was no scope for a consultant practising outside the service, since he must have access to hospital beds. The general practitioner was to be brought under control by the abolition of sale and purchase of practices and by direction; a practitioner who wanted to move would have to get permission from two committees and a central body. The Minister had said that he did not think that members of the medical profession were ripe to become salaried officers of the State; but he had not conceded any of the important issues that had been raised, such as the right to appeal to the courts from the Minister's decision regarding a doctor's retention in the service. The Minister had retained the right to do everything himself; in his hands was to lie the constitution of committees and councils and even selection of their chairmen. Should doctors enter the service on these terms? (Cries of No!) It would mean Civil Service dictation.

The Minister was apt to think that the doctors were talking airy nonsense. The special representative meeting of the B.M.A. in May had declared that they would not accept direction, State ownership of hospitals, abolition of rights in goodwill, or modification of the capitation fee. One side must give way; and a conflict was inevitable. The Minister should have followed South Africa's example and sought the doctors' advice before composing the Bill. If the meeting stood by the decision reached in May, it would be impossible for the council to negotiate on the regulations. The question had become political; Socialists would be prepared to work the service, but others were not prepared to join it under present conditions.

There came a moment when doctors must ask what action should be taken. The question was, should negotiations be broken off unless the association's principles were conceded? Doctors would perhaps be tempted by a generous financial offer. A special representative meeting might be necessary to decide the date on which a referendum should be put to the profession. It might be wise to wait for this until the Bill was enacted; the final form of the proposed service would then be known. If the profession agreed that the service would be a bad step, it was in a strong position for ensuring that what it thought best for the public was carried out.

A REFERENDUM?

Dr. D. C. BARRON (Sheffield) agreed with Dr. Dain, but suggested it would be unfair to have a referendum now without giving further guidance from the representative body. Other speakers called on the profession to make up its mind, and stick to its decision; it should be determined from the plebiscite whether or not the Act was to be fought.

Dr. G. P. WILLIAMS (Caernarvonshire and Anglesey) reminded the meeting that the Bill was nearly law; a small section of the community, such as doctors, would not dare to fight the law, much as it might dislike it. What was at stake for the general practitioner if he refused to work the Bill? The gap between solvency and insolvency was not great; to many, panel fees were a standby. If doctors opposed the law of this country they must live on fees from private patients. He agreed with the objections emphasised by the chairman of the council; it was, however, for the profession to decide, and the time for a referendum was not yet, because the terms were still unknown.

Dr. W. S. MACDONALD (Leeds) suggested that both the Minister and the profession wanted progress; he did not see why it was impossible for them to play in the same team, and he did not understand the difficulty of the Negotiating Committee in meeting the Minister. Opposition to the Bill was not going to do any credit to the profession, which was bound hand and foot to a tradition more enslaving than any imposed by a Government department. On April 1, 1948, people might aptly point to the profession and exclaim: "these are the fools that said in May and again in July, 1946, that they would have nothing to do with the Bill." The profession should negotiate with the Minister.

Mr. C. E. BEARE (Reigate) said that there was no question of flouting the law; the profession simply had to decide whether it would come in or stay out of the service. The Minister would be dragging in men as soon as the Bill was enacted, when he would be setting up regional boards; the referendum was a matter of urgency.

Dr. J. A. BROWN (Birmingham) sought to correct any misconstruction of Dr. Dain's speech: the association's action was, he said, unconnected with political opinions.

Dr. H. S. PASMORE (Kensington and Hammersmith) called for leadership and a simple explanation of the issues to the profession. Mr. R. SCOTT STEVENSON (Gibraltar) asked for an immediate and simple referendum, on the result of which the council should act. Dr. E. A. GREGG (St. Pancras) contended that negotiation of regulations would mean that the profession had started to work the Act; this was the moment for decision.

Dr. DAIN said it had been wrong to negotiate the sum for compensation while objecting to the principle. It would be fatal now to discuss regulations, with reservations. Details could not be discussed without parting with principles. The Minister refused to negotiate principles, and with them a fence was being created within which doctors would have to work. The association should take no hand in setting up regional boards until the Minister had conceded the principles.

Dr. E. W. GOODWIN (Leicestershire and Rutland) put a motion recommending a referendum to each consultant and general practitioner when the time was opportune. This, he said, should be put as soon as the Bill was seen in its final form; and there should be 75% accord before refusal to work the terms of the Bill was considered.

Dr. A. BROWN (Cambridge and Huntingdon) put an amendment calling for an immediate referendum on whether negotiations should be undertaken on regulations. A second referendum could be held later to decide whether the service was to be operated. Other speakers called for two referendums, the first of which should be held at once.

Dr. A. G. HOLMAN (East Norfolk) had grave misgivings as to the success of a referendum. In 1911 he had attended a meeting at which it had been decided almost unanimously that no part would be taken in the National Health Insurance scheme. Subsequently, he found that three-quarters of those present had already agreed, or else agreed almost immediately afterwards, to join the scheme. There was need for a mechanism which would ensure that doctors would stick to their recorded opinions. Dr. S. LAURIE SMITH (Blackpool and Fylde) was opposed to dividing the referendum; the association should wait and first learn how doctors were going to be paid and compensated.

Dr. TALBOT ROGERS (Bromley) suggested that no plebiscite should be held till it was seen what questions it should put. The response now would be emotional and changeable. He did not agree that little improvement to the Bill had been gained in the committee stage; among important improvements were the modification of the penal clauses and the granting to those remaining in practice of a voice in the selection of their colleagues. Regulations might be similarly modified by negotiation. The decision to hold a referendum on whether or not regulations were to be negotiated should be deferred until a special representative meeting, which should be called as soon as possible.

Other speakers supported the idea of a referendum, though opinions differed on the desirable time and scope. Dr. DAIN suggested that the timing should be left to the council; it should be held in the reasonably near future. In the meantime, those asked to help in framing regulations should reply that they could not do so until the result was known.

Dr. BROWN agreed to change his amendment so that it called for a referendum not immediately but in the near future. The amendment was carried.

Mr. LAWRENCE ABEL (Marylebone) refused to accept the amended motion as it stood; the council should, according to his rider, consider including in the plebiscite contact with each member of the profession. "Who comes to the meetings? The successful doctor, the keen doctor, and the busy doctor—like you and me"; and he added, "let's give the N.H.I. the go-by for a year or a year and a half."

The sense of the resolution, as it was finally passed, was that a referendum on the desirability of negotiating regulations should be taken soon; and that the meeting thought the council ought to consider including in it personal contact with the profession.

Standing orders were later suspended to allow the meeting to consider a motion that no registered medical practitioner should accept membership of any committee or board established under the National Health Service Act until the result of the forthcoming plebiscite was known. This was carried unanimously.

ALTERNATIVE METHODS OF PRACTICE

In answer to a questioning motion which sought to elucidate the form of practice contemplated by the association if the Bill should prove unacceptable, Dr. DAIN said that a number of different schemes had been considered without unanimity being reached. What would happen would be that, in areas with public medical services, these services would continue to operate; otherwise the ordinary methods of private practice would be pursued.

NURSING-HOMES

Dr. O. C. CARTER (Bournemouth) put forward a motion calling for the preservation of the private nursing-home. This was supported by Mr. A. DICKSON WRIGHT (Marylebone), who considered that the competition of the private nursing-home would be a valuable corrective to the Minister. The motion was carried.

COMPENSATION

Dr. A. C. E. BREACH (Bromley) moved that in the event of goodwill of practices being acquired by the State and of compensation being paid, the practices of those doctors who were killed or disabled by enemy action during the war should rank for compensation on the basis of the 1939 income in those cases where the goodwill had not already been sold. The practices described in the motion had, he said, been dissolved among other doctors. The motion was carried.

GENERAL PRACTICE

Dr. C. MACKIE (Worcester and Bromsgrove) moved an amendment to the principles designed to safeguard general practice under a 100% service, to provide that a practitioner might be free to conduct private practice at a health centre or elsewhere at his own discretion. How were busy doctors, he asked, to find time for double surgery duties at health centres and at private surgeries? They would have to pay rent for consulting rooms at both health centres and their own consulting rooms; and this might discourage younger men from practising privately. It should, he suggested, be possible to see private and public patients at health centres. Dr. S. WAND agreed that when the health centres were established they would have the advantage of good equipment; but it was difficult to see how the proposed course could be effected with a 100% National Health Service. The amendment was referred to council.

A Hendon amendment that patients who elect to obtain medical advice privately should not be required to pay for drugs and appliances was carried, as was a motion from Kensington that the council should give urgent consideration to the methods by which private practice might be maintained in the future. The meeting reaffirmed the decision reached at the special representative meeting that it was essential that financial and administrative arrangements should not penalise the doctor or patient that chose to remain outside the service; and the amended paragraph was approved.

SPECIAL PRACTICE

The discussion of the council's report on special practice was largely concerned with the future status of the part-time consultant and specialist. Dr. H. S. HOWIE WOOD (Isle of Wight), seeking an assurance that the council was mindful of these doctors' needs, said that he and many others were anxious about their practices and their hospital work when the National Health Service came into operation. Dr. DAIN pointed out that part-time consultants were being made members of the consultants' and specialists' committee. Nothing definite was known of the future, since the part-time consultant's status would be decided by regulation. Dr. HOWIE WOOD replied that there was apprehension that part-time consultants might become either full-time consultants or full-time general practitioners.

Dr. W. D. STEEL (Worcester and Bromsgrove) argued that, while there should be freedom of choice of consultants within prescribed limits, there should be for ambulant or movable patients complete freedom of choice of consultant. Dr. G. P. WILLIAMS (Caernarvonshire and Anglesey) said that North Wales had much to fear from regionalisation; it might be cut off from Liverpool before it could provide a good independent service. The Minister had recently promised a solution which he claimed would find "universal approval"; but its terms were unknown. Dr. R. G. GORDON (Bath), on behalf of spa doctors, also supported the amendment, which was carried.

THE OPEN DOOR

Dr. H. M. BIRD (West Suffolk) moved that the principle of the "open door" for pathology, radiology, and physiotherapy services should be adopted. It had been practised successfully in his area for the past 25 years. Giving practitioners direct access to these departments spared consultants, saved patients' time, and enabled practitioners to treat their patients intelligently. Dr. **Talbot Rogers** said that any other system was degrading for practitioners and specialists alike. In Kent, where a pathology service had been freely available for the past 15 years, it had been found that the doctor either knew exactly what he wanted or, if not, he did not send the patient for examination. The service had not been misused. Dr. **W. Gunn** (Greenwich and Deptford) considered that the adoption of the open-door policy would lead to the inundation of departments by applications for tests, so that reports might have to be made by technicians; the practitioner could undoubtedly interpret reports, but, under these conditions, he might not even be given the true facts. Other speakers opposed this view, and all who had had personal experience agreed that the system had worked well. Dr. **R. O. Eades** (East Suffolk) said that practitioners were at a division; if they were not given the instruments they would become simply signers of certificates and of *rep. mist.* forms. The principle underlying the motion was important.

The motion was carried.

NATIONAL MATERNITY SERVICE

Dr. **R. Forbes** (Hendon) called for opposition to the introduction of new criteria of qualification sponsored by the Royal College of Obstetricians or the Ministry of Health which would preclude competent general practitioners from engaging in midwifery among public or private patients. Dr. **G. Priestman** (Bradford) agreed, and added that criticism of the general practitioner's ability might be met by better liaison between the practitioner and the obstetric specialist; and in the general-practitioner hospital maternity beds should be set aside where the practitioner could do midwifery in collaboration with a specialist. The amendment was carried. The meeting agreed to a Greenwich amendment that in the future health service any general practitioner who desired to undertake obstetrics should undertake to remain efficient in midwifery. The representatives also supported a North Staffordshire motion that the minimum fee for attending a full confinement under local-authority arrangements should be five guineas.

Spens Report and Capitation Fee

Dr. **J. A. Brown** claimed that it had been necessary to recommend additional remuneration in unattractive areas only because of the miserable capitation fees. If sufficient capitation fees were paid, plus some additional remuneration for service in these areas, direction (negative or positive) would not be necessary. The Spens Committee had shown awareness of the need to attract men into general practice by good pay. Unless action to this end was taken, the medical service might find itself in the predicament in which the nursing profession now stood.

Dr. **E. A. Gregg**, chairman of the Insurance Acts Committee, announced that a further application had been made to the Ministry for an advance in the capitation fee. The Minister had sought to associate, in discussions with the committee's representatives, the question of capitation fees under the N.H.I. with payment of general practitioners in any future service. The delegation had replied that it was not within its province to embark on discussions of that character; the Minister was told that the profession had already given definite views on remuneration and especially on the question of basic salary. The suggested discussion could not be held until the profession's authority had been granted; the delegation's dissatisfaction had been firmly registered. At a second visit to the Ministry, officials had repeated the invitation to discuss these problems jointly; the delegation had again refused, and had suggested that the implications of the Spens report should be applied immediately. At a third interview, the delegation had been told that the Minister suggested an advance of 2*s*. in the capitation fee, and the following letter from the secretary to the Ministry had been received by the secretary of the association.

Dear Dr. Hill,

The Minister has asked me to refer to the recent meetings between his officers and representatives of the profession and in particular to the meeting held on Wednesday last with representatives of the Insurance Acts Committee about the remuneration of doctors within the National Health Insurance scheme during the period before the proposed National Health Service comes into operation.

The principal factor in any consideration of this question and of the question of remuneration in the future health service is the report of the Spens Committee on the Remuneration of General Practitioners. The Minister desires to make his attitude to that report quite clear. He fully accepts the substance of the recommendations of the committee in their majority report upon the general scope and range of remuneration which general practitioners should enjoy in a public service. The actual terms of remuneration cannot, however, be calculated from the recommendations by a simple process of arithmetic; the calculation involves consideration of a number of factors (e.g., the effect of a superannuation scheme and the percentage of betterment to be applied to pre-war figures) which are matters for discussion.

The Minister is consequently of opinion that the translation of the Spens recommendations into actual terms of remuneration—whether for the new health service or for the present health insurance scheme—is a matter which must be discussed with the profession. Moreover, in his view, it must be discussed as a whole; it is impossible to divorce the question of the current capitation rate from that of remuneration under the new health service since some of the problems to be examined affect both questions. He learnt, therefore, with regret of the feeling among your representatives that they are not authorised to discuss the terms of remuneration in the future health service now. He would have assumed that they could do so expressly without prejudice to the profession's subsequent general attitude to the National Health Service proposals—just as other representatives of the profession recently discussed the question of amounts of compensation without prejudice to the future attitude of the profession to the proposal to abolish the sale of practices in the public service. He still trusts that on further consideration your representatives will be willing to take part in the wider discussions which he for his part is prepared to begin at once.

If, however, the profession's representatives adhere to the view that they cannot do this, the Minister is left with no alternative but to defer discussion. In the meantime, he is prepared to increase the current capitation rate by an amount which appears to him to be reasonable. He therefore proposes to raise the present capitation fee to 12*s*. 6*d*. and in addition to regard this rate as having been operative since Jan. 1, 1946.

Ministry of Health, July 22. Wm. S. Douglas.

The I.A.C., Dr. Gregg continued, had considered the letter, and in its reply to the Minister had embodied two points: (1) the proposed increase of 2*s*. in the capitation fee was gravely inadequate; and (2) the committee would be prepared to recommend to insurance practitioners that they should accept an interim capitation fee of 15*s*. to operate retrospectively from Jan. 1. The committee would also be willing that the Spens Committee or its personnel should be asked to express their views on the implications of their report in relation to current capitation fees, provided that both the I.A.C. and the Minister accepted their findings in advance.

The meeting expressed unanimous approval of the I.A.C.'s action, and deferred further discussion of the subject.

Coroners and Post-mortems

Dr. R. Forbes (Hendon), who proposed that the council should be invited to review the working of the Coroners' Acts, said that amendments should be made to render the relationship between practitioner and coroner more happy. The office of coroner carried serious duties; doctors and other members of the public had had dreadful experiences; the duty of coroners should be restricted to finding the cause of death, and they should be prohibited from making adverse criticism, often irrelevant, of practitioners. Many doctors were asked for reports for which they were inadequately paid or unpaid. Moreover, necropsies were frequently undertaken without the practitioner who might be concerned being informed. Better facilities should be given to pathologists, and the fees they received should be improved, as should the fees for medical evidence in the coroner's court.

Dr. D. M. Thompson (Dartford) said that practitioners should have the right to do necropsies. Dr. W. B. A. Lewis (Shropshire), speaking as a part-time coroner, reported that the Coroners' Society was examining the question of improving the standard of pathology at necropsies. The coroner, he said, must be free to employ anyone he chose. It was ridiculous to expect that this specialised work should be competently undertaken by the general practitioner. An inquiry into the coroner's powers was an enormous task; there had been such an inquiry in 1936, but no new legislation had resulted.

Dr. Forbes's motion was carried.

Dr. I. G. Innes (East Yorks) moved that the decision as to who was competent to perform necropsies should not rest with the coroner. Necropsies, he said, should be performed only by a properly trained pathologist or by a man holding a certificate of competence. Dr. Lewis agreed that the proper person was a qualified pathologist and added that the place for the necropsy should be well equipped. In some places now used for post-mortems "it would be indecent to do an autopsy on a deceased cow." Dr. Forbes asked who, if not the coroner, was to decide. Coroners stood between practitioners and the public, and they were the most appropriate persons to make an impartial selection. The meeting proceeded to the next business.

Other Business

MILK

A discussion on the provision of pure milk revealed unanimous opinion that the Government should be prompted to provide clean milk; but the wording of the motion was delayed by protracted negotiations, which were enlivened by some propaganda jingle, based on nursery rhymes, from Mr. Lawrence Abel. Finally, Dr. Charles Hill, the secretary, composed, and Dr. Dain read, a motion urging that ideally all milk should be obtained from disease-free herds under the best hygienic conditions; that in the meantime all milk should be pasteurised, or, where efficient pasteurisation was not available, should be boiled; and that this should be emphasised immediately to the Minister of Health as a matter of urgent national importance. Authority's happy intervention was greeted with acclamation.

THE CHRONIC SICK

The representatives were sympathetic to the needs, which they agreed had been neglected, of the old and infirm, especially of those who were unable to care for themselves yet did not require to go to hospital. The solution, it was suggested, might lie in general-practitioner hospitals and in home helps. It was agreed that the problem was urgent; and more than one speaker mentioned examples of old people who, though not previously ill, had died within a week or two of admission to the institutions that were now provided for them. Dr. Alice Gilby pressed for domestic help and the provision of meals to this group; and Dr. Elsie Warren suggested that priority should be given to the chronic sick in blocks of flats near hospitals and health centres. A motion calling on the council to set up a committee to investigate the whole position was carried.

PART-TIME SERVICE

The new scales of pay recommended by the council for part-time employment by local authorities were discussed and approved. The interim revision of the Askwith scales was considered; representatives agreed that the outcome, especially for senior officers, had been unsatisfactory, but a motion expressing dissatisfaction with the methods and result of the negotiations was lost.

LECTURES AND CONFERENCES

Dr. Dain announced that it had been decided to set aside £1000 for the purpose of sending British medical lecturers to speak in other countries, and that an international conference was to be held in London in a few weeks' time from Sept. 25 to 27.

Annual Meeting

At the annual meeting of the association held on July 24 Sir Hugh Lett was inducted as president for 1946–47. In a short address he commended the increasing coöperation between the Royal Colleges and the Association, which, he said, must please all those who looked ahead. The formation, in 1940, of a joint council—the Medical Planning Commission—had been a historic step. Hitherto, the profession had been free from bureaucracy and the ebb and flow of politics; and clinical freedom must be preserved. "Medicine," he added, "is not as simple as building houses."

The Stewart prize was presented to Prof. Major Greenwood, F.R.S., and Dr. W. N. Pickles.

RED CROSS

THE INTERNATIONAL CONFERENCE

An international conference of the League of Red Cross Societies, held at Oxford from July 8 to 20, was attended by representatives of nearly 60 nations, including many distinguished members of the medical profession from the United States, the Dominions, the South American Republics, and various Continental countries. As this was the first conference since the war, a great deal of time was necessarily spent in discussing constitutional matters arising out of war-time experience, including the condemnation of indiscriminate means of attacking or enslaving civilian populations. The relationship of the League of Red Cross Societies, which is an association of all national Red Cross or Red Crescent organisations, to the International Red Cross Committee, which is a neutral body exclusively composed of Swiss citizens, also came under review.

One of the largest and most important committees set up by the conference, the advisory health committee, had before it a wide and somewhat ambitious programme, including such subjects as health propaganda, the improvement of first-aid training, the development of campaigns for extending the knowledge of nutritional principles and balanced diets, and the part which Red Cross members can play in connexion with the reablement of the disabled, the aftercare of the tuberculous, the provision of blood for transfusion services, and the establishment of centres for the treatment, under medical supervision, of the rheumatic disorders.

Much attention was paid to the valuable service which can be rendered by an organisation such as the Red Cross in recruiting voluntary assistants and donors for the maintenance of efficient blood-transfusion centres. With the close of the war, and the loss of the former sense of urgency, there is a natural tendency for donors to slacken off, but the increasing use of blood and blood-products, both for prophylaxis and for therapy, makes it imperative that this tendency should be checked. The Red Cross societies are peculiarly suited to undertake this task. In this connexion the committee also drew attention to the confusion which often results from the use of different coloured cards, in different countries, for donors of particular blood-groups, and urged the adoption of a uniform system.

The necessity of revising first-aid training so as to meet the new types of emergency resulting from modern methods of warfare was emphasised by many delegates, and the interesting suggestion was made that the league should consider the possibility of establishing an international first-aid certificate for those who passed the necessary tests.

The possibility of utilising the services of Red Cross members in reablement and in the aftercare of the tuberculous attracted great interest. It was felt that there is a big range of useful activities which could be undertaken by the Red Cross in helping to provide comforts and diversionary handicrafts for the homebound and for long-stay patients in hospitals and sanatoria, in assisting nurses, occupational therapists, and health visitors in the discharge of their skilled work on behalf of such patients, and possibly in taking a share in staffing reablement centres and tuberculosis colonies. A full report on this subject is to be prepared, and a memorandum published on the various forms of service which Red Cross members could render. During the conference special visits were paid to the reablement departments associated with the Wingfield-Morris Orthopædic Hospital, the Ripon Hall Annexe for Peripheral Nerve Injuries, and the Papworth Tuberculosis Colony, and films were shown illustrating work done in Royal Air Force centres and at Roehampton. Delegates from most countries were unfamiliar with the developments which have taken place in this direction. Other interesting visits were also paid to the British Red Cross Rheumatism Clinic and to a blood-transfusion depot.

Throughout the conference reference was repeatedly made to the need for better interchange of information on such subjects as the prevention and treatment of infectious disorders, the treatment of serious accidents, and the combating of shock. A meeting of experts in First Aid and Traumatic Surgery is to be convened in 1947 or 1948, and the possibility of holding a conference on Infectious Diseases, and of establishing an *International Health Review*, was submitted to the league secretariat for further study.

UROLOGICAL SURVEY OF BRITAIN

THE British Association of Urological Surgeons has issued a statement of the principles which should govern the distribution and organisation of the national urological service which must be an essential part of the new National Health Service scheme. The statement is confined to a short general outline of the problem; but the association has access to further information, and is prepared to coöperate fully with the Ministry through the Royal College of Surgeons in examining details and in making specific recommendations.

PRINCIPLES

Three main points are made at the outset: (1) that urology is a highly developed, and from the point of view of equipment an expensive, specialty; (2) that specially trained nurses are needed both before and after operation; and (3) that a considerable proportion of urological patients first seek medical assistance because of urgent conditions. It follows therefore that urological departments cannot be provided in every hospital and must be limited to large central hospitals: but the staffs of certain smaller hospitals must include surgeons competent to render the correct immediate treatment for urgent cases and to decide when it is necessary to transfer patients to a fully equipped and fully staffed urological department. The policy should be to bring the patient to the specialist and not the specialist to the patient. At the same time it is not thought possible or desirable that all cases of genito-urinary diseases should be under the direct control of urologists: their aim should be to raise the standard of urological surgery and to be available for consultation.

In applying these principles to general recommendations for the number and distribution of urological departments, the association has encountered a common difficulty—namely, the confusion of terms to distinguish the different grades of hospitals. It divides all hospitals into four grades: (1) the university centre (containing a medical school); (2) area group hospitals; (3) area hospitals; and (4) sub-area hospitals (which include all smaller institutions). One or more urological departments should be included in every university centre, and one in certain of the area group hospitals. "Each area hospital should contain the necessary equipment and be able to obtain the services of surgeons competent (*a*) to deal with urological emergencies, (*b*) to carry out the preliminary investigations necessary for initial diagnosis of urological disease, thereby ensuring that suitable cases receive specialised treatment and avoiding unnecessary transfer of cases which do not require it, (*c*) to undertake routine treatment when conditions are favourable." In remote districts certain sub-area hospitals should have similar facilities.

DEPARTMENTAL STAFFS

The training of surgeons and nurses in urology will mainly be concentrated in the university centre; it may also be undertaken in any urological department, but not elsewhere. A urologist should have received training, and gained experience, in general surgery, and should hold a higher qualification in surgery. It is not essential that he should be engaged solely in urology. This attitude of refusal to regard urology as a narrow and exclusive specialty is further reflected in a recommendation that the general practitioner who has referred a patient to a special clinic should be encouraged to follow closely his subsequent progress. A doctor cannot retain interest in a subject of which he has little knowledge; and ignorance may lead to a fatal error in early diagnosis.

The staff of a department should be headed by a chief urologist who, in certain university centres, should be appointed to a chair (but not necessarily on a whole-time basis). He should be available for consultation not only with colleagues in the hospital containing his department but in associated special and general hospitals and sanatoria throughout his region. There should be a staff of assistants, anæsthetists, and specially trained male and female nurses; and a physician interested in urological diseases should be associated with the department. Good pathological and radiological services and a follow-up department are also essential. Research should be mainly concentrated in the university centres.

In those hospitals where a limited amount of urology is done but in which there is not a complete department, there would be an assistant urologist who might be seconded for a period from the staff of a university centre. At non-urological hospitals in remote districts special outpatient sessions might be arranged for which a visiting urologist would attend.

Emphasis is laid on the need for accommodation and nursing by the many elderly patients who are disabled by urological disease and who require protracted attention and supervision. It is unnecessary for most of these to be retained continuously in urological departments, and they should be accommodated elsewhere.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JULY 20

Notifications.—Smallpox, 0; scarlet fever, 936; whooping-cough, 2474; diphtheria, 247; paratyphoid, 20; typhoid, 6; measles (excluding rubella), 3783; pneumonia (primary or influenzal), 380; cerebrospinal fever, 49; poliomyelitis, 10; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 60; puerperal pyrexia, 133; ophthalmia neonatorum, 66. No case of cholera or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 3 (0) from measles, 4 (1) from whooping-cough, 1 (0) from diphtheria, 36 (2) from diarrhœa and enteritis under two years, and 2 (0) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 11 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 241 (corresponding to a rate of 26 per thousand total births), including 31 in London.

In England Now

A Running Commentary by Peripatetic Correspondents

OUR forefathers were content to die after a glimpse of Naples. But, owing to the recent association of that once proud city with rats, typhus, and Fascism, we must look for a substitute for our successors. I have never seen Naples—nor do I wish to—but looking back I realise how great would have been my loss had I passed over without the memory of my stay in Java, especially Batavia. A year here, and a week stolen in Bali, have convinced me that the apparently soulless designation "SEAC" embraces a world of its own. Perhaps the unusual circumstances of our arrival contributed much, our field ambulance with the 1st Bn. Seaforth being the first troops to enter Java after the Rising Sun was set.

We found Batavia a beautiful city of wide boulevards, internment camps, night-clubs, starvation, bright lights, and overflowing shops. And the girls . . . after a year in Nasik, Deolali, and Bombay it was like the promised land, or maybe Hollywood. Then came trouble. No-one quite knew how it started, but the boulevards became dirty, the cafés closed, the lights went out, and the overflowing shops which did not empty themselves and lock up were looted. But, serene amid the turmoil, the Officers' Club organised dances, and one drove the ladies home to the camps, with the music of Stens in the ear, and with head and foot well down. One M.O., a regular supporter of the club, was rash enough to take a pot at a sniper outside one night, and was rewarded with a bullet through the liver. Later it was reported that the bullet had been partially deflected by a hobnail, and the damage was not serious.

Our field ambulance then moved to Bandoeng in the hills to the south; then back down the road via Tjiandjoer and Poentjak, the former a personification of the classical causes of typhoid, the latter as lovely as a May morning amid the blossom at home, and presided over by a volcano. Now we are back in Batavia, where after 5 months we find much is changed. The grey camouflaged buildings are a dazzling white, and order has arisen from chaos. Also there are many Dutch in uniforms.

We remember the days when our field ambulance was the only military medical unit in Batavia, and our private practice (without pay) grew alarmingly. A general with fish-poisoning, six Chinese at the end of the sick-parade, and the girl at Boxlaan who said she didn't mind if there was no chaperon. Dec. 25 found Father Christmas taking sick-parade and exhibiting tonics of sherry, port, and gin to astonished and debilitated Sepoys, while one of us tried to stitch a cut head, with corks popping out and a jeep driving round the M.I. room. Those were the days when the Jocks held Batavia in their palm, and we did our best to treat them when it got too hot to hold, and they were burnt.

So, as we prepare to move out of Java, an eventful year closes, which has shown what war can do to a country. There is a strange fascination in the sight of beauty being destroyed in the struggle for possession, and later as it rises again like a phœnix there is the urge to slink away; for those who saw the ruins and saved what they could for the future tended to become idealists, dreaming dreams of the future.

Be the outcome as it may, many a man will rouse him at the name of Java, and then, thinking better of it, hold his peace. They had their reward.

* * *

The lot of the returned consultant is an unhappy one; but that is another story. One windy day in early March I sat miserably at my desk in new and expensive consulting-rooms. The window-frames had gleamed with shining cream paint, which was a source of innocent pride. Then some prying inquisitor had found that all the window cords needed to be renewed. So I sat unhappily with back to ruined paintwork while a wizened little man noisily removed the window-frames, exposing my greying hairs to the icy blast. Like all true craftsmen he wore his cap in the house, and at first his taciturnity seemed to match my own. I forget what started the conversation. Probably it was the weather, for I recall that in this matter, too, he was a specialist, and he reviewed the vagaries of our climate for every March during the past ten years. From that we drifted to holidays; and perhaps it was that his fixity of purpose committed him to the well-worn grooves of familiar story, but from that moment he seemed set on some Gadarene course of self-revelation. I should like to think that some kindliness in my face or manner inspired him to relate the story, but truth compe the opinion that his technique was that of the Ancient Mariner, and that he marked me down for the poor fish that I am.

"I like the country," he said, "the West Country. I went to Cornwall once to see a man I 'adn't seen for forty years, and 'e wasn't a bit pleased to see me." He warmed to his subject. "'E was a clergyman, and as a matter of fact 'e was my father, though 'e wasn't married to my mother. She was the daughter of the landlady where 'e 'ad lodgings as a young man, and I was a twin but the other one died. Me mother's brother, Mr. Blank, looked after me and farmed me out. But I got to know 'oo me father was, and I made up me mind that I'd save a bit of money and go down and see 'im one
day. Isn't it natural that a son would want to see
father? Of course 'e was married then and 'ad tw
grown-up sons, both of 'em in the Army and in a goc
position—where I might 'ave been if I'd 'ad me rights.
It was Easter weekend and I stayed in the villa
asking a few questions and making sure I was on the rig
track. It was 'im right enough, and 'e was the vi
and well-respected in those parts. I goes to his chur
on Good Friday and spots 'im orf. And on Sund
afternoon when 'e's walking from the church to t
vicarage, I walks up to 'im and says, 'Good afternoo
'Good afternoon,' says 'e. 'Do you know Mr. Blank
says I. 'Of course I do, I know 'im well,' 'e says, ve
friendly. 'Then you know me, because I'm yo
eldest son.' 'E went deathly white and I thoug
'e would 'ave dropped, but 'e recovers himself quick
and shakes me 'and and says 'e is pleased to see me. 'I
like to talk to you,' I says. 'Come tomorrow,' he say
'come and see me at 3 o'clock.' I was a bit early ne
day and 'e seemed put out; but we settled down to ta
for a bit, when in came another chap 'oo said he was
solicitor, and me father left the room. 'What
you want?' this man says. 'Is it money?' 'All
want is me rights,' I says. 'E did 'is best to get me
take money, but I wouldn't 'ave it. Nice way for
father to treat 'is eldest son—trying to get somethi
on 'im for blackmail. After some more talk of t
kind I went off, and soon after I went back 'ome
London. But I made up me mind that I wouldn
leave the matter there. 'E died two years ago an
I wrote to 'is widow and asked where 'e was burie
Isn't it natural that a son should want to know whe
'is father was buried?"

By this time the cords were fixed and the window w
replaced, to my added comfort, but the story flowed o
"All I got was a letter from the solicitor threatenin
me with the law if I wrote again. But I 'aven't finish
with 'em. I kept that letter, and I get the local pap
every week to find out what me brothers are doing an
'ow they're getting on. All me father ever spent
me was eight shillings a week, and then 'e was behin
with 'is payments twice. I know because 'e wro
letters and me foster-mother gave 'em to me; and th
is 'ow I knew 'oo 'e was." He shook his head slow
and sadly. "The trouble is that the law of the countr
is agin people like me."

The last chip was knocked off the paint; the las
thumb-mark imprinted on the frame. The little ma
gathered up his tools—"Good-day," said he, and wen
out of my life, to find another Wedding Guest for his stor
and his bitterness.

* * *

I suppose every hospital staff-room is used to badinag
between the various departments. Though this ma
date back to the times when the feuds between th
physicians and the barber surgeons were really seriou
today the chaff, even if occasionally heavy handed
leaves no sting behind, and, like the tale told by Shake
speare's idiot, signifies nothing. So perhaps it is a
well that it was left to the expert who sets the *Time*
crossword puzzles to discover that "psychologist"
is an anagram of "pigsty school." Comment is super
fluous and might be dangerous.

Parliament

ON THE FLOOR OF THE HOUSE

HE first year of the Labour Government is ending, we are gradually getting, nationally and inter- ionally, into a peace perspective. The Budget is proaching a balance, policy on the future of the fence Forces is being worked out in detail, and the ace conferences have opened in Paris.

Our expenditure this year is estimated at £3887 llion (last year £5565 million) and the reduction is Defence expenditure. When the peace treaties have en signed, our responsibilities will diminish further; t we still have them in India, in the Middle East, d (as Lord Nathan has been reminding the House of ords) over the length and breadth of world-wide mmunications. It is clear that we shall still have to ce expenditure on a high scale in connexion with the ommonwealth and Empire and with our peace- eping functions on behalf of the United Nations. If e 1914–18 war was a chemists' war, and the 1939–45 ar a physicists' war, a future war might well be a iologists' war, judging by the hints of disease warfare nd radioactive warfare (apart of course from the atom omb) coming out of the United States. Conceptions of trategy may have to be revolutionised, and it is to be oped that general staffs will advise their governments hat war must be outlawed if the races and nations now egarded as civilised are to survive. The United Nations rganisation must succeed. The problem of peace is eing viewed through the haze of an atom-bomb dust- loud and perhaps seen all the more clearly because of hat.

In the House of Commons we have devoted two days o the report stage of the National Health Service Bill and one day to its third reading. The Bill in its final House of Commons' form is passed to the House of Lords nd is unlikely to be much changed before it goes for he Royal Assent. The appointed day for the inception of the National Health Act is now expected to be April 1, 1948, and it will have to be brought into relation with the National Insurance Bill which passed through its House of Lords' stage also last week.

Mr. Aneurin Bevan received, from his own side and from the Conservative opposition, many tributes of admiration before the final vote was taken. For the pposition decided to put down a "reasoned amend- ent" to the third reading so that they could say all ey wanted to in praise or criticism—and the doses ere fairly mixed—and yet register their antagonism certain of the Bill's principles. For the most part ose who opposed the Bill looked back to the past, and ose who supported it looked forward to the future. he old ways have gone; but it was impossible to keep em wholly, as the Hospital Surveys made plain, quite part from declarations by Coalition Ministers of Health om Brown to Willink. The new ways have not come et and will need much hard work in preparation. The inister's appeal to the medical profession for coöperation making the National Health Service fully and truly ccessful was an obviously sincere one. Medical opinion the House, and the opinion of those most closely in ouch with medical and hospital administration, is that his coöperation will be forthcoming.

MEDICUS, M.P.

Wing-Commander N. J. HULBERT asked the Minister f Food if he would consider granting doctors in country istricts an extra allowance of bread to compensate r the difficulties they experienced in obtaining eals at regular hours.—Dr. E. SUMMERSKILL replied: he Minister regrets that he is unable to adopt this ggestion.

NATIONAL HEALTH SERVICE BILL

THE THIRD READING

IN moving the third reading Mr. C. W. KEY described the National Health Service Bill as the major Bill of the session, for it attacked one of the greatest social problems of our day—the care of the sick and halt, the maimed and injured members of the community. By other means the Government were engaged in raising standards of nutrition, housing, clothing, and education to improve the health of the people, but it would unfortunately always be necessary to give early and adequate attention to the onset of disease, the result of accidents, and the effects of increasing age.

No major change had been made in the Bill, he continued, since the second reading. The tripartite character of the services remained, and the machinery for their provision and administration was the same. But minor amendments had been made, and in its present form the Bill was better than it was. Some would still regret this or the other provision or omission, but democracy meant not only that the will of the majority must prevail but that when the set-up of the services was settled it was the duty of all to coöperate in making the scheme a success. It might possibly take a little time to get into the right state of mind to operate the Bill, but Mr. Key was convinced that the doctors and doctored, hospital governors and municipal councils, Ministry representatives and health-service workers would all come together to work out the details of this great service.

THE AMENDMENT

The amendment tabled by the Opposition that

> This House, while welcoming a comprehensive Health Service, declines to give a Third Reading to a Bill which discourages voluntary effort and association; mutilates the structure of local government; dangerously increases Ministerial power and patronage; appropriates trust funds and benefactions in contempt of the wishes of donors and subscribers; and undermines the freedom and independence of the medical profession to the detriment of the nation

Mr. Key described as five inexcusable inexactitudes. The Bill did not discourage voluntary effort. By regional boards, management committees, and house committees it widened the opportunity for voluntary services in the control of hospitals. By extending to boards and management committees the power to accept gifts and hold endowments it encouraged local effort, and by guaranteeing the maintenance of the institutions it set free voluntary contributions for the improvement of the amenities and personal comfort of the patients. But it did discourage the unsocial belief that the provision of essential services for the common people should depend on the chance results of charitable appeals.

Nor did the Bill mutilate the structure of local government. It made no change save that where experience showed that this would be beneficial it made possible the combination of health authorities under general boards consisting of their representatives. In the interests of administration it had been necessary to transfer some powers from one authority to another, but provision had been made for members of the authority from which the powers had been transferred to participate in their future performance by the new body. New powers and duties had also been given to the local authorities.

The Bill was also charged with dangerously increasing Ministerial power and patronage. But every increase in the functions of the publicly elected representatives of the people was dangerous to the private interests of the privileged classes represented on the benches opposite. So long as largely self-appointed administrators of charitable institutions were left in charge, not only of the voluntary funds but also of considerable contributions from national funds, all was well, but as soon as the people through their elected agents determined to manage the services for themselves the situation became dangerous. He was happy in the knowledge that this danger was destined to grow. All appointments to the bodies that would carry out the Minister's powers were to be exercised after consultation with the organisations concerned, and it was obvious to any unprejudiced person that they would not rest on the mere *ipse dixit* of the Minister. The regional boards and the hospital management committees would appoint and employ practically all the hospital staff. In the general-practitioner service the Minister had control to a negative extent over the distribution of doctors through the Medical Practices Committee. But this was no new power, but one which had been enjoyed for over 30 years by ministers in relation to medical and other benefits under the National Insurance scheme.

The charge that trust funds and benefactions had been appropriated in contempt of the wishes of donors was astonishing. The funds were given for the provision of a hospital service, but surely for the benefit of the people and not institutions. Instead of offering to supplement these assets from public funds the Government, to simplify the financial administration of the service, were covering the whole of the hospitals' current expenses and capital development out of public funds. What the donors wished was being done, not with their money but with public funds, and their endowments were set free to provide extras to the normal services. Many patients who had been able to find treatment for their ills only in cottage hospitals would now get better specialised services in other institutions never before available to them. Surely the donors gave these funds not to the bricks and mortar of the cottage hospitals, *but for the benefit of the patients, and it was right that* the funds should follow the patients, no matter to which institution they were sent.

To say that the Bill undermined the freedom and independence of the medical profession was the perversion par excellence. Every doctor was free to enter the service or not as he chose; if he entered, he was free to take or reject patients, even free to accept private patients. But if he entered the service he must accept the essential conditions of the service. Had the freedom of the doctor in the past been undermined because he had accepted a post as medical officer of health, or a salaried appointment in a municipal or voluntary hospital? No body of public or private employees, Mr. Key declared, had ever had the freedom the medical profession would have under the Bill. The local executive council which appointed the general practitioner would consist of 50% professional members appointed not by the Minister but by the profession itself, and of the Medical Practices Committee the chairman and six out of eight members must be doctors.

Mr. H. LINSTEAD in formally moving the Opposition's amendment confessed he was fortified in doing so by Mr. Key's remarks. The Bill would provide a dull, uniform, unimaginative, and pedestrian health service. It would not remove the present lack of coördination among the health services. We should still have half a dozen Government departments reponsible for various types of health service, and local services divorced from one another, with health centres where three or four authorities would meet in the same building.

The task of the reformer should be to remedy the admitted defects of the present system while retaining its advantages, and this could be achieved by centralised planning and by localised administration, by not being afraid to trust locally elected people with the spending of public money, by using to the maximum voluntary work in administration, and by allowing the great professions to take part in the work with the minimum loss to their freedom. The present Bill was remote in practice and spirit from these concepts. Decentralisation was achieved not by using the circumstance of local growth but by uprooting the present system, gathering it into the centre, and then artificially devolving it outwards again. The least possible use was made of voluntary effort, and the maximum central control exercised over the professions, with every possible inducement to compel medical practitioners, if necessary against their better judgment, to come into the scheme.

Mr. Key had said that power was concentrated in the publicly elected representatives of the people. Was this not a curious way of describing the civil servants of the Ministry of Health? Again Mr. Key had said that all powers of nomination would be exercised by the Minister only after consultation with the appropriate organisations. But these organisations were to be selected by the Minister. The Minister had the power of the purse and of the veto over the whole development of the health service of the country. It was a quick, easy, and tidy way to produce an efficient service, but it might equally well provide a poor, dull, and rigid service. The Bill would kill the voluntary hospitals, and it would take away the whole of the hospitals from the London County Council, removing their control to new and remote regional boards. To compensate the larger local authorities for the loss of their hospitals the Bill took away from the smaller authorities the domiciliary services which ought to have their roots in their own localities. In its treatment of endowments the Bill made a serious attack upon the sanctity of contract and the right of people to dispose of their goods as they desired. It put the medical profession in chains by negative direction and the prohibition of the sale of practices. The selection of a partner now rested ultimately with an executive committee. It deprived the practitioner who stayed outside the scheme of access to hospital beds. It supplanted by means of new tribunals the professional disciplinary committees.

Remembering the emphasis laid on general practice taking place in health centres, Mr. Linstead prophesied that in a few years we should reach a goal that would be the death of a free profession—that was a salaried medical service. The Minister would deny that he had any intention of producing this, but the power resided in his hands to accomplish it. They had seen a change in the Minister's outlook as the Bill passed through committee, but that change was not reflected in the structure of the Bill. Members of the standing committee believed that Mr. Bevan would bring enthusiasm and vigour to his task, but they saw in the Bill real danger of a bottleneck in administration, and believed that it would provide a second-rate service. They recognised, however, that it was practically a fait-accompli, and the least they could do was to give the Minister their good wishes and hope that he would lighten the centralised direction and give full play to initiative, enthusiasm, and professional freedom, remembering that those were the things that had built the greatness of British medicine.

TWO MASTERS

Mr. D. ECCLES regretted that the Bill took away the doctor's single duty to his patient and substituted a double responsibility to the State and to the patient. Though a patient in the general wards of a big hospital might not even know the name of the surgeon who operated on him, he had confidence in him because he had confidence in the hospital and in the general practitioner who sent him there. The tradition of the undivided responsibility of the independent doctor to his patient had been taught to succeeding generations of medical students along with the rest of the medical curriculum, and the Minister had recognised the value of this tradition by the special and unsocial treatment which he gave to the teaching hospitals. But how could the teaching hospitals in the future instil the same sense of duty when students knew that part of their income was to be a State salary and that throughout their careers they would be affected by the favour or disfavour of the Minister or his nominees? The normal reaction of human beings was to keep one eye on the boss, and what would it profit the Minister if he set up a service only to find that doctors and nurses paid more attention to his regulations than to their patients?

Mr. Eccles admitted that our present hospital system was inadequate, but pointed out that Lord Dawson, who had diagnosed the disease as long ago as 1920, had prescribed as a remedy not the Socialist amputation performed by the totalitarian knife but the grafting of new services on the old. The Bill had a grand objective but it set up a second-rate instrument, for it put more emphasis on the control than on the character of the doctors, and paid more attention to the finances, administration, and ownership of the hospitals than to the care and recovery of the sick.

Dr. STEPHEN TAYLOR congratulated the Minister on cutting his way through existing interests to produce a workable health service. The Opposition painted a picture of commercially minded doctors and testators which he was sure was unjust. So far as he could see *the only kind of voluntary effort eliminated by the Bill* was the signing of one's name at the bottom of a cheque the selling of flags. The need for real voluntary fort had never been greater. and if those who complained about getting rid of the voluntary hospitals anted to help let them organise themselves and once a eek do some domestic work in the linen-rooms and itchens of the hospitals. Mr. Eccles had said that the ill made the doctor serve two masters, but surely the ctor already had to balance his duty to the individual nd to the community; and under the new organisation Dr. Taylor was sure he would continue to do so. A real anger he saw in the Bill was that it gave the doctors o much freedom. and he feared that we might impose n ourselves a medical dictatorship. The Minister had ried to combine the principles of industrial democracy ith the principles of general democracy, and to get ufficient medical and lay representation on all the overning agencies of the scheme to ensure that while he doctors had their say the ultimate control would est with the people.

FINAL SUGGESTIONS

Dr. Taylor hoped that all appointments in the new ervice would be publicly advertised, and that there would e a maximum of mobility among doctors. with flexible perannuation schemes. He also asked the Minister settling the pay of doctors and other health workers to nsist on adequate objective criteria, such as service, qualifications, special experience, and refresher courses, nd to avoid putting the doctor in the position of having o please someone else in order to obtain extra income.

The essential difference between voluntary and municipal hospitals, Dr. Taylor suggested, was not the way they raised their money but the way they were staffed. The municipal hospitals in the past had been staffed on a hierarchical principle, with a medical superintendent at the top who had been converted from a doctor into an administrator. In the voluntary hospitals there had been a parallel structure with a few physicians or surgeons all equal and the chances of promotion had been greater. He hoped that under the new scheme we should see a development of the parallel system. Medical qualifications were not very difficult to obtain if one had money and could stay the course, and though the medical profession had many brilliant members the efficiency of the general practitioner who worked in isolation could be improved. He suggested that a special form of inspection might help in which one general practitioner was visited by another, picked out for six months to do inspectoral work, who would report to no-one except the doctor he inspected. Finally, Dr. Taylor asked the Minister for adequate secretarial help for all doctors in the service, and urged that its circulars should be written in King's English and large type.

The new service, he ended, was not a drab extension of commercialism but a glorious adventure, and he hoped that when the organisation began to exist that spirit would pervade it.

Mr. F. **MESSER** said that when the Bill went into committee he was under the impression that they were going into an operating-theatre where a good deal of surgical work would be performed. But the surgeon in charge did not give them much chance and did most of the operating himself, applying with outstanding success an anæsthetic to his own supporters which made a good many believe things they had opposed all their lives. Mr. Messer confessed that at the second reading he had been critical of the Bill, for he saw a danger in remoteness of control; but he had been reassured by the new powers given to the hospital management committees. People who were ill were leading an artificial life robbed of activity and the ability to come and go, and they needed special consideration. Hospital catering for instance was very important. If management committees were entirely dependent on a central authority miles away we should lack that detailed day-to-day human touch so essential to the patient.

Today, in the housing shortage, childbearing was a social as well as a medical problem, and he would like to see the local authority given the right to secure maternity accommodation for the woman who was to have a normal confinement. He also felt that the ambulance service should not be under the local health authorities but be part of the hospital service. He could not remember any other Bill which depended so much on regulations, and when we got those regulations we should see just how the measure would work.

Mrs. M. **RIDEALGH** regretted that arrangements for the prevention of illness, for aftercare, and for the provision of domestic help were still only permissive. Quoting an article from THE LANCET of June 29, discussing interim unemployment among doctors, she asked the Minister to use these doctors now, even if it meant sending them to under-doctored parts of the country as panel doctors. This would be a preparation for the general-practitioner part of the Bill.

SOME WARNING NOTES

Sir **ERNEST GRAHAM-LITTLE** thought that though there was great disinclination among doctors to accept service under the Bill they would not strike, but they might say, "We do not want to work under a State service, and we shall continue to work as we are now." To work the scheme 150,000 doctors would be needed. At present there were some 50,000 active practitioners, and he thought that not more than half of these were likely to join the service. He did not see how the Minister could obtain anything like the number of doctors who would be needed to put the Bill into operation by 1948.

Sir **HENRY MORRIS-JONES**, though he objected to the Bill in principle on a number of issues, appealed to the doctors of the country to try to work the scheme. When the giant octopus of the State caught hold of an industry or profession it was very cold for those who remained outside, but he hoped that in time the swing and play of democratic opinion would enable a Government to emerge which would redress many of the defects in the Bill.

Mr. **SOMERVILLE HASTINGS** welcomed the Bill because of its universal application. When it became law its advantages would be open to everybody without qualification or waiting period. For the first time we were to have a unified hospital system which he hoped would combine the best of the voluntary and municipal systems. Though he thought the Minister right in increasing thus far the power of the hospital management committees, he wanted to strike a warning note. The use of beds, he felt, should not be left entirely to the committees. One of the benefits of regionalisation was that beds could be used to the best advantage. Staffing conditions must be unified, and he suggested that all staff, not only doctors, should have the right to appeal from decisions of the committees to the regional boards. The boards should also have the right to influence at any rate the higher appointments. It was right that the committees should be able to spend money as they desired, but it was important that we should see that each committee used its money to the best advantage and kept all its services up to par. Bulk purchases and uniform methods of record-keeping were also questions that should not be left to the whims of individual hospitals. He commended these points to the Minister for consideration when making his regulations, so as to avoid the development of another voluntary hospital system within the great scheme he had devised.

Dr. H. B. **MORGAN** believed that most doctors, if they could be rid of political prejudice, would work this Bill as a great profession would be expected to. He was struck by the fact that doctors were so highly efficient in their profession that in political and sociological matters they were completely ignorant.

THE END AND THE BEGINNING

Mr. H. **WILLINK** hoped that a comprehensive health service would not be retarded or frustrated by the vices of the Bill. He made bold to say that, but for the difficulties which the Minister had placed upon the department and upon the local authorities by his scheme, the service could have come into operation at least nine months earlier. He also regretted the lamentable obscurity of the law with regard to mental health as it emerged from the Bill.

In committee, he thought, four substantial improvements to the Bill had been made. The position of the Central Health Services Council had been improved. Changes in its constitution had now to be brought before the House. The council must be consulted before the Minister decided not to publish

the selling of flags. The need for real voluntary fort had never been greater. and if those who comained about getting rid of the voluntary hospitals anted to help let them organise themselves and once a eek do some domestic work in the linen-rooms and tchens of the hospitals. Mr. Eccles had said that the ill made the doctor serve two masters, but surely the ctor already had to balance his duty to the individual id to the community, and under the new organisation r. Taylor was sure he would continue to do so. A real anger he saw in the Bill was that it gave the doctors o much freedom. and he feared that we might impose n ourselves a medical dictatorship. The Minister had ied to combine the principles of industrial democracy ith the principles of general democracy, and to get fficient medical and lay representation on all the overning agencies of the scheme to ensure that while e doctors had their say the ultimate control would st with the people.

FINAL SUGGESTIONS

Dr. Taylor hoped that all appointments in the new ervice would be publicly advertised, and that there would e a maximum of mobility among doctors, with flexible perannuation schemes. He also asked the Minister settling the pay of doctors and other health workers to sist on adequate objective criteria, such as service, ualifications, special experience, and refresher courses, nd to avoid putting the doctor in the position of having o please someone else in order to obtain extra income.

The essential difference between voluntary and unicipal hospitals, Dr. Taylor suggested, was not the ray they raised their money but the way they were taffed. The municipal hospitals in the past had been taffed on a hierarchical principle, with a medical superntendent at the top who had been converted from a loctor into an administrator. In the voluntary hospitals here had been a parallel structure with a few physicians or surgeons all equal and the chances of promotion had een greater. He hoped that under the new scheme we hould see a development of the parallel system. Medical ualifications were not very difficult to obtain if one had noney and could stay the course, and though the medical rofession had many brilliant members the efficiency the general practitioner who worked in isolation could e improved. He suggested that a special form of nspection might help in which one general practitioner was visited by another, picked out for six months to do inspectoral work, who would report to no-one except the doctor he inspected. Finally, Dr. Taylor asked the Minister for adequate secretarial help for all doctors in the service, and urged that its circulars should be written in King's English and large type.

The new service, he ended, was not a drab extension of commercialism but a glorious adventure, and he hoped that when the organisation began to exist that spirit would pervade it.

Mr. F. MESSER said that when the Bill went into committee he was under the impression that they were going into an operating-theatre where a good deal of surgical work would be performed. But the surgeon in charge did not give them much chance and did most of the operating himself, applying with outstanding success an anæsthetic to his own supporters which made a good any believe things they had opposed all their lives. Mr. Messer confessed that at the second reading he had been critical of the Bill. for he saw a danger in remoteness of control; but he had been reassured by the new powers given to the hospital management committees. People who were ill were leading an artificial life robbed of activity and the ability to come and go, and they needed special consideration. Hospital catering for instance was very important. If management committees were entirely dependent on a central authority miles away we should lack that detailed day-to-day human touch so essential to the patient.

Today, in the housing shortage, childbearing was a social as well as a medical problem, and he would like to see the local authority given the right to secure maternity accommodation for the woman who was to have a normal confinement. He also felt that the ambulance service should not be under the local health authorities but be part of the hospital service. He could not remember any other Bill which depended so much on regulations, and when we got those regulations we should see just how the measure would work.

Mrs. M. RIDEALGH regretted that arrangements for the prevention of illness, for aftercare, and for the provision of domestic help were still only permissive. Quoting an article from THE LANCET of June 29, discussing interim unemployment among doctors. she asked the Minister to use these doctors now, even if it meant sending them to under-doctored parts of the country as panel doctors. This would be a preparation for the general-practitioner part of the Bill.

SOME WARNING NOTES

Sir ERNEST GRAHAM-LITTLE thought that though there was great disinclination among doctors to accept service under the Bill they would not strike, but they might say, "We do not want to work under a State service, and we shall continue to work as we are now." To work the scheme 150,000 doctors would be needed. At present there were some 50,000 active practitioners, and he thought that not more than half of these were likely to join the service. He did not see how the Minister could obtain anything like the number of doctors who would be needed to put the Bill into operation by 1948.

Sir HENRY MORRIS-JONES, though he objected to the Bill in principle on a number of issues, appealed to the doctors of the country to try to work the scheme. When the giant octopus of the State caught hold of an industry or profession it was very cold for those who remained outside, but he hoped that in time the swing and play of democratic opinion would enable a Government to emerge which would redress many of the defects in the Bill.

Mr. SOMERVILLE HASTINGS welcomed the Bill because of its universal application. When it became law its advantages would be open to everybody without qualification or waiting period. For the first time we were to have a unified hospital system which he hoped would combine the best of the voluntary and municipal systems. Though he thought the Minister right in increasing thus far the power of the hospital management committees, he wanted to strike a warning note. The use of beds, he felt, should not be left entirely to the committees. One of the benefits of regionalisation was that beds could be used to the best advantage. Staffing conditions must be unified, and he suggested that all staff, not only doctors, should have the right to appeal from decisions of the committees to the regional boards. The boards should also have the right to influence at any rate the higher appointments. It was right that the committees should be able to spend money as they desired. but it was important that we should see that each committee used its money to the best advantage and kept all its services up to par. Bulk purchases and uniform methods of record-keeping were also questions that should not be left to the whims of individual hospitals. He commended these points to the Minister for consideration when making his regulations, so as to avoid the development of another voluntary hospital system within the great scheme he had devised.

Dr. H. B. MORGAN believed that most doctors, if they could be rid of political prejudice, would work this Bill as a great profession would be expected to. He was struck by the fact that doctors were so highly efficient in their profession that in political and sociological matters they were completely ignorant.

THE END AND THE BEGINNING

Mr. H. WILLINK hoped that a comprehensive health service would not be retarded or frustrated by the vices of the Bill. He made bold to say that, but for the difficulties which the Minister had placed upon the department and upon the local authorities by his scheme, the service could have come into operation at least nine months earlier. He also regretted the lamentable obscurity of the law with regard to mental health as it emerged from the Bill.

In committee, he thought, four substantial improvements to the Bill had been made. The position of the Central Health Services Council had been improved. Changes in its constitution had now to be brought before the House. The council must be consulted before the Minister decided not to publish any part of their advice. There were to be standing advisory committees on the hospital services and on blood-transfusion, in addition to those mentioned in the white-paper. The standing committees would also have power to initiate advice. The position of the hospital management committees had also been improved, and the remoteness of the Medical Practices Committee had been mitigated by the promise that in substance the doctors of the districts would make the effective decisions as to the succession to practices. Lastly the extreme hardship of the penal provisions of clause 35 had been lightened. But on the grounds of the attack on local government, on voluntary effort and association, the excessive centralisation of power in the hands of the Minister, and the dangers entailed for the medical profession, he still felt bound to vote for the amendment.

Mr. A. BEVAN said that criticism had been levelled at what was described as the excessive Ministerial power which existed in the Bill. But, if in return for a contribution a service was guaranteed, that contract could not be carried out through independent and self-motivating bodies. The instruments of the service must be the agents of the Minister. But, through the regional boards, management, and house committees the scheme provided a measure of decentralisation so that local people could have as much influence as possible over the medical and hospital services. The reason for the bitterness of the Opposition was that the Bill removed one of their chief sources of social and political patronage. The only aspect of the voluntary organisations which the scheme destroyed was that the care of the sick should depend upon the benefactions of the well-to-do. But there would be more room for voluntary service in the new scheme than at present, and voluntary work would be more efficient because it would be emancipated from financial limitations. What had been called benefactions to the hospitals in the form of covenants were often diversions of money from the Chancellor of the Exchequer to the purposes of private individuals.

He was astonished that the leaders of the doctors had now identified themselves in a spirit of partisanship with the Conservative party, for the spokesmen of some elements of the profession had now become the most reactionary politicians in Great Britain. He believed that the profession as a whole would work the scheme whole-heartedly. In a recent plebiscite they had decided by a majority in favour of the abolition of the sale of practices, and the ban was not an interference with the liberty of the doctor but a protection to him and to the patient. Why should a young doctor have to seek the help of a usurer before he could practise? Could that be called "a sense of adventure in medicine"? If we were to man the medical profession effectively we must derive our doctors from lower income groups than hitherto. Therefore it was essential that we should start them off in proper fashion.

Quoting in his turn, Mr. Bevan recalled Lord Dawson's words on a national health scheme:

> What is required to be done is that the State shall provide to the medical profession an instrument, a machine and an apparatus of health which the profession shall freely exercise without let or hindrance.

And in no part of this administration, he affirmed, did the Minister or any other authority have the slightest control over the professional conduct of the doctor. The doctors were not State servants but in contract with a body on which there was a half professional representation. Under the present scheme the doctors could only appeal to the Minister, but under the new scheme they also had the right of appeal to the tribunal. They were the most protected profession in the country.

The Bill had emerged from committee with its main structure unimpaired, but its machinery had been improved and he was grateful to the members on both sides for their help. Now we had come to the third reading, and he hoped to leave controversy behind and to get the coöperation of the medical profession and of all health workers in the country without which the scheme would fail.

"The House of Commons," he ended, "only passes Bills; but it is the men and women outside who can make them living realities. Now that we are reaching the conclusion, let me hope that the echoes of controversy will die down, and that what will reach our ears will not be the declamations of partisans but the whispers and the piteous appeals of sick people all over the country, of the weak and distressed, who are reaching out their hands to this House of Commons to give them succour and assistance in their difficulties. I believe that, eventually, it will be that small voice that will be heard, and that will be most influential, and not the raucous declamations of controversialism."

The amendment was defeated by 261 votes to 113 and the Bill read a third time and passed.

QUESTION TIME

Certificate for Patient Attending Osteopath

Mr. G. HOUSE asked the Minister of Health whether he was aware that Mrs. C. Barker, 118, Fairview Road, Penn, was refused a medical certificate by her doctor, of whose name he had been informed, on the ground that she attended an osteopath without the doctor's permission, and thereby lost benefit from her friendly society; and if he would inquire into this case and take steps to rectify injustices of this nature.—Mr. A. BEVAN replied: An insurance doctor is under no obligation to issue a medical certificate to a patient who is obtaining treatment from some other person without his consent. The payment of sickness benefit is a matter the Minister of National Insurance, but I understand the approved societies are required to give due consideration to whatever evidence of incapacity is submitted in support of a claim to benefit.

White Flour and Bread for Invalids

Mr. K. S. DIGBY asked the Minister of Food on what grounds it had been decided that no white flour or white bread should be made available for invalids who were unable to digest bread made from supplies of flour having an extraction-rate of 90% although special provision was made for such persons during the 1914–18 war.—Mr. J. STRACHEY replied: The Food Rationing (Special Diets) Advisory Committee of the Medical Research Council advised the Ministry before the extraction-rate of flour was raised to 90% that they saw no reason for making special provision for white flour to invalids provided the extraction-rate did not exceed 90%.

Special Bread Allowance for School-children

Lieut.-Colonel G. CLIFTON-BROWN asked the Minister Food if a special bread allowance could be made for school-children when a midday school meal was not provided.—Mr. STRACHEY replied: I regret that I cannot adopt this suggestion. The allowances for children have been fixed to meet their needs even if they do not get school meals.

Tuberculosis Patients and Priority Milk

Mr. T. DRIBERG asked the Minister of Food if he had considered the case of the working-class household at Braintree, particulars of which had been submitted to him, in which 10s. 6d. a week was paid out for priority milk for two members of the household suffering from tuberculosis; and if he would make it possible for tuberculous people to get priority milk at a cheaper rate, as in the case of babies and expectant mothers.—Mr. STRACHEY replied: I appreciate that this is a very hard case. But I do not think that the way to meet it is to extend the National Milk Scheme. Perhaps the honourable Member will consult with my Ministry and the Ministry of Health on the matter.

Mass Radiography

Replying to Mr. R. W. SORENSEN, Mr. A. BEVAN stated that in England and Wales up to Dec. 31, 1945, approximately 797,000 civilians had been examined by mass radiography, of whom 2900 were diagnosed as suffering from active tuberculous conditions. Of those requiring institutional treatment 830 had been admitted to such treatment up to Dec. 31 last, and admissions since then would have substantially increased this number. He could not give the exact figure of those who had had to be placed on the waiting-list for sanatorium beds because of the prevailing shortage of hospital staff, but unceasing efforts were being made to remedy this shortage. In answer to a further question Mr. Bevan added that he was advised that there could be no standard rule about frequency of examination. Regular survey of the same groups was obviously desirable, but *present resources*—which were steadily *increasing*—still kept us short of that ideal.

Letters to the Editor

A BRITISH INSTITUTE OF INDUSTRIAL MEDICINE?

SIR,—No machine can be greater than the man who orks it: if greater output is to be achieved, industrial anufactures must be fitted to human needs. Vague xpressions of humanistic hopes are valueless: what is eeded is authoritative advice translated into terms of ricks and steel, inches and pounds. For this there are wo essentials—first, investigations of the problems roubling labour and management, and, secondly, the ranslation of the results of these investigations into veryday terms.

The Health of Munition Workers Committee and the Industrial Fatigue Research Board did great pioneer vork in the 1914–18 war, when many fundamental contributions were made to our knowledge of the requirenents for health in industry; the story about hours of vork, rest pauses, and output is now old history. It essential, however, to remember that industrial health a medical problem and not to be confused with labour anagement. In spite of recent criticism, much of it olitical, British industry is on the whole up to date and quick to apply new knowledge. What is wanted is speedy and wide dissemination of information about the lay-to-day practical problems of industry.

In the late war the Industrial Health Research Board sponsored a great deal of work, but the subjects selected or investigation seem limited; and there is a great gap between the acquisition of knowledge and its application o industry. This might be due to shortage of investiga-ors or to the fact that little remains to be investigated. Neither explanation seems likely; and the annual eport of the Senior Medical Inspector of Factories shows hat problems are arising daily in industry. Can it be hat the Medical Research Council, acting through the ndustrial Health Research Board, is the wrong body to conduct research in industry?

Industry must be practical, and the Industrial Health Research Board is too far removed from contact with ndustry to help in the daily problems. Even industrial edical officers will testify that their contact with the ndustrial Health Research Board is negligible. Moreover, the board is scarcely equipped to undertake cademic research. which is the function of the newly reated university departments of industrial medicine. The department for research in industrial medicine at the London Hospital, and the Psychological Laboratory, Cambridge, have done admirable work, but these are pecialised units on the fringe of industrial medicine. No doubt similar units will be developed for the investigaion of special subjects (for example, pneumoconiosis), nd it is to be hoped that the universities will take special nterest in the problems of their industrial hinterland.

Potentially, therefore, there exists tremendous capacity or research; the question is how to make this cover the whole field of industrial medicine and how to make the esults quickly known to those who plan and work in ndustry. The outsider sees the *present effort as very* iffuse; there is no place and no person to whom he can go for information. A *foreigner coming into this country* r well wonder what we are doing in research in indusal health.

What is needed is a central focus. The National nsurance (Industrial Injuries) Bill *enables* the Minister or National Insurance to promote research if he so wishes; t the Coal Industry Nation*alisation Act goes further* d imposes a duty on the Minister of Fuel and Power o secure the prosecution of *research.*" *Let this* be the portunity to found a British Institute of Industrial dicine which shall be the focus *for all those interested* industrial health: for the alternative seems to be the ablishment of more and more separate *centres* adminised by an ever-increasing number of authorities. The stitute would have its own staff of highly skilled medical perts with experience in the hard grind of industry. should be a coördinating but *never* a controlling dy, and it should stimulate research but not prescribe e work of independent investigators.

Through the Medical Inspectorate of Factories and lustrial medical officers the *institute could keep* in close contact with the daily happenings in industry; it would institute and conduct research on its own premises, for which purpose medical inspectors and industrial medical officers might be seconded to it; and, above all, it should have an information section to which doctors, managers, and trade unionists might go for assistance. Regular bulletins should be published. In spite of the many hazards of industry, no central information office is yet available. In this respect Britain lags behind other nations, especially the U.S.A., whose industrial hygiene information service, centred at Bethesda, is admirable.

Finally, the head of this institute, who must have a very wide experience of medicine and industry, should be a member or even chairman of a reorganised and revivified Industrial Health Research Board, and so link the institute with other medical research.

This is an expansive conception of research in industrial medicine; it calls for a large and modern building, well equipped and staffed by a large and highly skilled body of medical and other experts, generously paid. But, considered in relation to its importance to industry, the cost of a British Institute of Industrial Medicine would be negligible. It should not be forgotten that improved health means greater output.

G. F. KEATINGE.
Nottingham. T. A. LLOYD DAVIES.

ADRENALECTOMY FOR PROSTATIC CANCER

SIR,—It is hardly surprising that, despite the evidence in favour, adrenalectomy has not proved a satisfactory method of treating patients in whom prostatic cancer shows recrudescence after relief through castration. My comments on the question raised in your annotation of July 20—why does castration mitigate the symptoms of prostatic cancer and why is this mitigation not permanent?—are as follows.

It is now generally believed that the growth of cancer of the prostate, and even of *its metastases,* depends on androgens. After castration, androgens produced by the testicles are absent, and their absence stimulates the pituitary to compensatory hyperfunction—i.e., overproduction of gonadotrophic hormones. This leads to secondary enlargement of the adrenals and increased androgen production by them, accounting for the recrudescence of an androgen-sensitive prostatic cancer after its growth has been checked by castration.

In a patient already weakened by castration removal of the suprarenals is hardly a practical method of treatment, in view of the magnitude of the operation and the risks incurred. I would suggest therefore that in cases of carcinoma of the prostate one should attempt from the first to inhibit the pituitary—i.e., inhibit the production of gonadotrophic hormones which stimulate both testicles and adrenals to form androgens. This can be done by applying X rays to the pituitary gland and by giving œstrogens, with which good results have of course already been achieved.

The mode of action of œstrogens, such as stilbœstrol, is not yet certain, but they are supposed to inhibit the secretion of pituitary gonadotrophins, thus reducing the secretion of androgens by the testis and suprarenals. In animals changes in the pituitary are produced by prolonged administration of œstrogens in large dosage.

Hitchin. D. GUTMANN.

C.CM. OR MILLILITRE?

SIR,—Dr. Hamill, in his first letter (June 29), *states* that the volume of 1 c.cm. is not one millilitre. With this I agree. In his second letter (July 13) he *indicates* that if a clinician injects one or more c.cm., as measured in a syringe graduated in c.cm., he should say that he has injected the same number of millilitres, as this is "quite accurate enough for all medical purposes." With this I disagree. The physician must therefore choose between being accurate and *recording that* he has injected so many c.cm. and being inaccurate and pleasing Dr. Hamill. When our *syringes are* graduated in millilitres he will not have to make this difficult choice. In the meantime I *prefer to be accurate and to* call a spade a spade and not a shovel, and a c.cm. a c.cm. and not a millilitre.

London, W.1. G. E. BEAUMONT.

UNEMPLOYMENT AMONG DOCTORS

SIR,—The Socialist member for North Ilford (Mrs. Ridealgh) in a speech (*Hansard*, July 26) on the third reading of the National Health Service Bill, read a long quotation from your annotation of June 29. She described the "unemployment that is prevalent amongst doctors" as "due to the fact that the Act does not come into force until April 1, 1948," and she quoted your article as sustaining this argument.

I would suggest that a much more obvious reason for this "unemployment" is the uncertainty of the future and the dislocation of customary methods of entering practice occasioned by the abolition of transfer of goodwill, and perhaps still more importantly, by the disinclination of so many of the younger men in the profession to undertake practice under the conditions imposed by the Bill.

In the debate in March, 1944, on the white-paper disclosing the intentions of the Coalition Government with regard to the future health services, the Parliamentary Secretary to the Minister of Health, in answer to a question "what should a doctor do who did not wish to enter the public service," replied "He could emigrate or retire." A recent inquiry at the Dominions Offices in London shows a very large number of applications from young doctors seeking to avoid the public service by adopting the first alternative suggested by the Parliamentary Secretary, by emigrating to the Dominions. When one adds that it is extremely improbable, if not absolutely impossible, that the Act will come into operation with any prospect of fulfilment in April, 1948—or I would suggest, for many years later than that date—the chaos produced by this uncertainty is indeed a serious consideration.

Mrs. Ridealgh's suggestion that the Minister "should use these doctors now, even if it means sending them to different parts of the country which are under-doctored and using them as panel doctors" affords an interesting revelation of the attitude of her party in dealing with our old and proud profession.

London, W.1. E. GRAHAM-LITTLE.

B.C.G.

SIR,—Since the completion of the memorandum which you summarised last week I have heard of a development of possible importance. As usually prepared, B.C.G. vaccine must be used within a few days, and, faced with the problem of sending it to far distant places, Russian scientists have been experimenting with methods of preserving it in the dry state for longer periods. E. N. Leschinskaya (*Amer. Rev. Soviet Med.* 1946, 3, 210) states that freeze-drying of a bacillary suspension in 50% glucose solution yields a product which retains full viability and immunising efficacy for at least 18 months.

A major difficulty in production of B.C.G. has been that the vaccine must be used before tests for virulence, or for the presence of virulent contaminants, can be completed, which necessitates the most rigid supervision and complicated precautions at all stages of preparation. If it can be stored so that tests are complete before it is issued, the process of production can be simplified both technically and administratively, and public confidence at the same time increased. Further, preparation of large batches at long intervals, rather than frequent small batches, may make for greater uniformity of dosage, and should reduce production costs.

Preliminary experiments to test the efficacy of the Russian and of other comparable methods are under way.

Cardiff. W. H. TYTLER.

PRELIMINARY proposals for constructive legislation to reduce the nuisance of smoke have been published by the National Smoke Abatement Society, which has drafted three sets of byelaws: the first would require all fuel-burning installations, other than domestic, to receive the approval of local authorities; the second is concerned with ensuring that existing plants are maintained in good working condition and are not overloaded; and the third deals with the certification of furnacemen. The draft proposals may be obtained, price 3*d.*, from the society at Chandos House, Buckingham Gate, London, S.W.1.

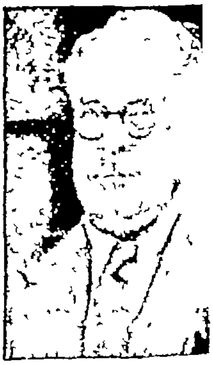
Obituary

ROBERT EDWARD ROBERTS

M.D., B.SC. LPOOL, F.R.C.P., F.F.R., D.P.H., D.M.R.E.

Dr. R. E. Roberts died suddenly on July 19, at the age of 56. Some three years ago he had had a warning of what might come; but he carried on, enjoying his work and his friendships with a good-humoured acceptance of the precariousness of his days.

He was educated at Birkenhead School and at the University of Liverpool. Before taking up medicine he gained his B.SC., and then qualified M.B. in 1914, almost immediately volunteering for the Army at the outbreak of war. He served until 1918, mainly in India, and was mentioned in despatches. On his return to Liverpool he obtained the D.P.H. in 1919 and the M.D. in 192 For a time he worked in the department of pathology with the late E. E. Glynn. He had already started a radiological practice with his friend J. H. Mather, and it was not long before they joined forces with Charles Thurston Holland. When Holland retired, a few years later, from the Liverpool Royal Infirmary, Roberts (already assistant radiologist to the hospital) was his natural successor. Holland was the pioneer, but the reputation of the Liverpool school of radiology could not have been consolidated and enlarged without the help, in their different but complementary ways, of his two younger colleagues.



Roberts was a first-class radiologist, helpful and full of common sense when faced with a difficult problem in practice. A solid background of science and pathology, however, gave him in addition a breadth of view and an academic outlook which coloured his whole career. Like all good teachers, he enjoyed teaching: he was in his element when for an hour or two he could forget routine work and the calls of practice, and discuss films and their problems with a fortunate and fascinated group of students. His systematic postgraduate lectures on radiology, lovingly prepared with every point clearly marshalled and beautifully illustrated, still live in the memory of those whom he has trained. Like all good teachers, he taught fundamental principles and stimulated men's minds. He enjoyed, too, the occasions when a colleague brought his clinical clerks or dressers into the X-ray department for discussion and correlation of the clinical and radiological aspects of some patient in the wards. Many a student fresh to clinical work must have learned the proper place of radiology in medicine from these encounters. He himself remained a learner all his days, and he was always eager to enlarge his experience.

He wrote with authority on many aspects of his subject, and he contributed chapters on the female genital tract, obstetrics, and tumours and cysts of bone to the *Text-book of X-ray Diagnosis.* He was consulting radiologist to various hospitals, and lecturer in radiology in the University of Liverpool, and from time to time he was invited to lecture on obstetrical radiology at the British Postgraduate School. He never sought honours, but he delighted in them when they came to him—president of the radiological section of the Royal Society of Medicine, president of the Faculty of Radiologists, vice-president of the British Institute of Radiology, examiner in radiology in the University of London, and fellow of the Royal College of Physicians. During the war he became regional adviser in radiology to the E.M.S., and he was also honorary consulting radiologist to the Army at Home. These responsibilities he undertook and fulfilled without fuss or publicity. He had a keen public sense, and on committee or in council he was generous and disinterested. He abhorred intrigue and every form of pomp or insincerity, and in his latter years he sometimes let things go by default because uncolleaguely manners saddened and hurt him.

R. E."—Robin, to his friends—looked like a com- table, massive countryman. His very gait was genial, l his tolerant chuckle was a joy to hear. He retained the end a boyish zest for work and life. Until the ent war, he was a keen golfer. He enjoyed good food, od wine, good companionship, good conversation. He s happy in his home and his garden. He was sensitive gentle, and little children loved him. He enjoyed friends, and he gave them a rare sense of warmth in friendship. An eminent radiologist, a grand teacher, umble, sincere, and lovable man—it has been good to e and work with him.

He leaves his widow with two daughters, one of whom s just finished her nursing training at his own hospital.

R. C.

HECTOR ALFRED COLWELL

M.B., PH.D. LOND., M.R.C.P.

Dr. H. A. Colwell, who died on July 22 after a long ness at the age of 71, was educated at Tollington Park ollege, King's College, and St. Bartholomew's Hospital, here, he qualified in 1900. A few years in general actice convinced him he had not found his métier, d he became pathological assistant in the cancer earch laboratories of the Middlesex Hospital. To period belongs his fruitful collaboration with Prof. dney Russ and Dr. R. J. Gladstone, which was interpted in 1916 when he joined the R.A.M.C. Most of olwell's war service was spent in Salonika as pathologist the 36th general hospital, and his all-round medical ility, supplemented by a knowledge of practically every nguage spoken in that part of the world, made him a aluable officer. But dysentery was rife, and after veral attacks he was invalided to Malta.

On his return to civilian life he took up radiotherapy ith Dr. Robert Knox at King's College Hospital, and in 925 succeeded him as director of the department. He rved as a member of the grand council and executive ommittee of the British Empire Cancer Campaign, and 1934 he was awarded the Garton gold medal and prize of at body for his essay on the biological effects and mode action of radiations upon malignant and other cells.

"Colwell's contributions to medical literature," writes colleague, "may well be considered his most significant k. His paper, with Gladstone, on the effect of repeated es of X rays upon the chick embryo is still often uoted, and in 1915, when medical radiology was cutting s teeth, he published, with Russ, *Radium, X rays, nd the Living Cell*, which provided those taking up the udy of the new specialty with a valuable background physical and biological fact. One of his most delightful ooks was an essay on the *History of Electrotherapy*, hile one of his most trenchant was *X-ray and Radium njuries*, again with Russ as joint author. He also ublished, with Wakeley, an *Introduction to the Study X Rays and Radium*, and one book in purely historical ein on Gideon Harvey. Colwell always wrote with eticulous care and he put a lot of feeling into what e said about radium quackery. One of the few remaining edical scholars among us, he was a beautiful pianist nd a man to whom languages presented little difficulty. is friendships were few but unbroken, and after he tired about ten years ago he enjoyed up to a point s leisure which was largely spent in his study. But e death of his wife in January of this year was a blow which he never recovered."

DR. IZOD BENNETT

Mr. H. V. Anson writes: Your notice of Dr. T. Izod ennett's death inspires me to make one addition from layman who knew him very well and who admired his edical qualities from a distance but his personal ualities from near to. It was his interest in artists and eir work which impressed me and many others, and so far as this may have contributed to his wonderful timation of men as a whole it may interest your ofessional readers.

In the sense that an artist's work—be it of a painter, et, or musician, or other—is inclined to be so often recognised in its non-utilitarian aspect, it was Bennett ho was the first to fight its battle, as he fought the tle of disease, relentlessly and fearlessly.

lany are the artists whom he has helped both medically l also in their life work. If he did not like their work he saw the possibility of admiring it. If he could neither like nor admire them or their work he was so imbued with integrity of character that he would say so in no unmeasured terms and drop the artist and his work. He hated sham but was always a true friend to sincerity and was never too knowing to refuse to learn in, to what may have been to him, an unfamiliar field.

Appointments

Champion, A. H. R., M.B., D.D.SC. Melb., F.R.C.S.E., D.L.O.: visiting plastic surgeon, Duchess of York Hospital for Babies, Manchester.

Christie, A. B., M.D. Aberd., D.P.H.: medical superintendent, City Hospital, Liverpool.

Clark, J. M. P., M.B.E., M.B. Leeds, F.R.C.S.: asst. orthopædic surgeon, General Infirmary, Leeds.

Gartside, V. O. B., D.S.M., M.R.C.S.: asst. port M.O., Dover.

Lanckenau, Nellie, M.D. Lond.: physician i/c of physiotherapy dept., Queen Mary's Hospital for the East End, London.

Langford, Frank, M.B. Brist., F.R.C.S.: M.O.H. and school M.O., East Sussex.

MacGregor, I. W., M.B. Aberd.: asst. surgeon in E.N.T. dept., Worcester Royal Infirmary.

Moore, Thomas, M.D., M.S. Durh., F.R.C.S.: visiting surgeon, Duchess of York Hospital for Babies, Manchester.

Ogilvie, L. A., M.B. Glasg., F.R.F.P.S.: M.O., County Infirmary and Cottage Homes, Tredegar, Mon.

Payton, C. G., M.D. Birm., M.B. Edin., D.P.H.: M.O.H. and school M.O., Northampton.

Vickers, A. A., M.B. Lond., D.M.R.: asst. radiologist, Worcester Royal Infirmary.

Acton Hospital: The following appointments are announced:

- Cruickshank, Alexander, M.B. Aberd., F.R.C.S.: third consulting surgeon.
- Hambly, E. H., M.B. Lond., F.R.C.S.: orthopædic surgeon.
- Hopkins, J. L., L.M.S.S.A., D.A.: anæsthetist.
- Lewis, J. S., M.R.C.S.: anæsthetist.
- Malley, C. P., M.B. N.U.I., F.R.C.S.: E.N.T. surgeon.
- Rodgers, R. E., M.D. Camb., M.R.C.P.: second consulting physician.

Birmingham United Hospital:

- Baines, G. H., M.B. Camb., F.R.C.S.: asst. surgeon.
- Collis, J. L., M.D. Birm., F.R.C.S.: asst. surgeon.
- D'Abreu, A. L., O.B.E., CH.M. Birm., F.R.C.S.: asst. surgeon.
- Donovan, T. S., M.B. Birm., M.CH. ORTH. Lpool, F.R.C.S.: asst. surgeon.
- Hall, G. S., M.D. Birm., M.R.C.P.: asst. physician.
- Innes, Alexander, M.B.E., M.B. Camb., F.R.C.S.: asst. surgeon.
- Malins, Joan M., M.B. Birm., M.R.C.P.: asst. physician.
- Parsons, C. G., M.D. Camb., F.R.C.P.: asst. physician.
- St. Johnston, C. R., M.D. Birm., M.R.C.P.: asst. physician.

Middlesex County Council:

- Carter, A. Barham, M.D. Camb., M.R.C.P.: physician, Ashford County Hospital.
- Castleden, L. I. M., M.D. Lond., M.R.C.P.: physician, Redhill County Hospital.
- Forty, Frank, M.B. Lond., F.R.C.S.: surgeon, Redhill County Hospital.
- Hall, H. W., M.B. Lond., F.R.C.S.: surgeon, North Middlesex County Hospital.
- Jackson, E. B., M.D. Lond., M.R.C.P.: physician, Hillingdon County Hospital.
- Jones, F. Avery, M.D. Lond., F.R.C.P.: physician, Central Middlesex County Hospital.
- Kempthorne, Renatus, B.M. Oxfd, M.R.C.P.: physician, North Middlesex County Hospital.
- Laird, Robert, CH.M. Glasg., F.R.C.S.E.: surgeon, Clare Hall County Hospital.
- Matheson, N. M., M.B. N.Z., F.R.C.S., M.R.C.P., F.A.C.S.: surgeon, Ashford County Hospital.
- Morgan, Joyce, M.D. Lond., M.R.C.O.G., D.A.: obstetric surgeon, Hillingdon County Hospital.

Queen Victoria Royal Infirmary, Preston:

- Anderson, D. M., M.D. Edin., M.R.C.P.E.: physician.
- Corbet, R. H. J. M., M.B. Dubl., M.A.O., F.R.C.S.I., F.R.C.P.I., F.R.C.O.G.: obstetrician-gynæcologist.
- Garden, R. S., M.B. Aberd., M.CH.ORTH. Lpool, F.R.C.S.E.: orthopædic surgeon.
- Graham, W. H., M.B. Glasg., F.R.C.S.: urologist.
- Wiseman, D. C., M.B. Glasg., F.R.C.S.E., M.R.C.O.G.: asst. obstetrician-gynæcologist.

Royal United Hospital, Bath:

- Apley, John, M.D. Lond., M.R.C.P.: pædiatrician.
- Bastow, John, M.D. Melb., F.R.C.S.: orthopædic surgeon
- Evans, C. D., O.B.E., M.B. Camb.: dermatologist.
- Fuller, H. L., F.R.C.S.: surgeon.
- Glaser, S., M.B. Lond., F.R.C.S.: asst. surgeon.
- Heathcote, H. J., M.B. Camb.: venereologist.
- Hill, L. C., M.D. Birm., F.R.C.P.: asst. physician.
- Hoffman, H. L., M.D. Camb., M.R.C.P.: asst. physician.
- Johnson, H. J., M.B. Durh., D.M.R.E.: asst. radiologist.
- Kersley, G. D., M.D. Camb., F.R.C.P.: physician.
- Leech-Wilkinson, Arthur, B.M. Oxfd, F.R.C.S.: gynæcologist.
- Montgomerie, T., M.B., D.A.: anæsthetist.
- Murphy, F. D., O.B.E., M.B. N.U.I., F.R.C.S.: asst. surgeon.
- Neill, H. G., M.B. Glasg., F.R.F.P.S.: anæsthetist.
- Northover, P. T., M.D. Edin., D.A.: anæsthetist.
- Sanson, J. M., M.B. Edin., F.R.C.S.E., M.R.C.O.G.: asst. gynæcologist.
- Watson, Mary, M.B. N.Z.: anæsthetist.
- Wilson, Donald, M.B. Lond., M.R.C.P.: physician to physiotherapy dept.

Examining Surgeons under the Factories Act, 1937:

- MacArthur, Duncan, M.B. St. And.: Sevenoaks, Kent.
- Milne, J. P., M.B. Aberd.: Keith, Banff.
- Moorhead, C. E., M.B. Birm.: Chipping Campden, Gloucester.
- Porter, A. S., M.R.C.S.: Hitchin, Hertford.
- Spark, C. V., M.B. Aberd.: Atherstone, Warwick.

Notes and News

L.C.C. HOSPITAL COMMITTEES

AT the outbreak of war the monthly meetings of these hospital committees were temporarily suspended, and they are at present still only meeting four times a year. The council now proposes that after the holidays meetings should be held every two months, and they hope to reconsider the matter early next year. The orders of reference of the committees will be the same as before, including regular visits to the wards and inspection of diets, appointment of ladies' visiting committees, investigation of complaints by patients, examination of the hospital books, consideration of reports by the medical superintendent and other senior officers, approval of requisitions for supplies, appointment and promotion of certain grades of staff, disposal of small gifts of money, and consideration of works for inclusion in the annual maintenance estimates. Before the war the committees also dealt with the granting of special and casual leave and with discipline, but these matters are now reserved for the establishment and general purposes committees of the council where they will, at any rate for the present, remain.

So far the hospital committees have dealt only with administrative matters not involving expenditure. The council now proposes to authorise them to sanction expenditure for annual amounts, varying from £200 for larger hospitals to £50 for smaller hospitals. They will be allowed to spend money on small improvements, such as bookcases or electrical equipment for patients or staff, and on the provision of additional amenities, such as furniture or pictures. These changes are part of the council's policy of "strengthening the individuality of each hospital without prejudice to its efficient administration as an integral part of a large service."

BIRTHS AND MARRIAGES

LIVE births in England and Wales during the June quarter of this year totalled 203,797, which represents a birth-rate of 19·2—the highest in any quarter since June, 1925. In the previous quarter, ended March 31, the number of births was 181,445; this exceeded deaths by 26,292. Infant mortality in the March quarter was 55 per thousand related live births —14 per 1000 below the average of the preceding ten March quarters and 4 below the March quarter, 1945. The number of illegitimate births—14,577—was 3061 fewer than in the corresponding period last year. Marriages totalled 77,480—an increase of 866 over the March quarter a year ago, but 3360 fewer than the average for the March quarters of the years 1940–44. These figures are given in the Registrar-General's Return for the March quarter, obtainable from H.M. Stationery Office at 6*d*.

University of London

Dr. N. Hamilton Fairley, F.R.S., has been appointed to the Wellcome chair of tropical medicine tenable at the London School of Hygiene and Tropical Medicine, from Oct. 1 next. Dr. George Macdonald, whose appointment as director of the Ross Institute of Tropical Medicine was announced last December, has been appointed to the university chair of tropical hygiene tenable at the London School of Hygiene and Tropical Medicine, from Oct. 1 next.

Dr. F. C. O. Valentine has been appointed to the university readership in chemotherapy tenable at the London Hospital Medical College, from Oct. 1 next. The title of professor of morbid anatomy and histology has been conferred on Dr. R. W. Scarff, in respect of the post held by him at the Middlesex Hospital Medical School.

The title of professor emeritus of helminthology has been conferred on Prof. R. T. Leiper, F.R.S., who retires in September from the William Julien Courtauld chair of helminthology at the London School of Hygiene and Tropical Medicine, which he has held since 1917. The title of professor emeritus of experimental pathology has been conferred on Prof. E. L. Kennaway, F.R.S., who retires in September from the chair of experimental pathology at the Chester Beatty Research Institute of the Royal Cancer Hospital, which he has held since 1931.

At a recent examination for the academic postgraduate diploma in public health the following candidates from the London School of Hygiene were successful:

S. G. Abelson, Olatunji Adeniyi-Jones, Alexander Anderson, A. E. Brown, J. M. Brown, E. J. Bury, A. L. Cochrane, W. C. Cockburn, E. R. Dansie, R. D. Dewar, W. Y. Fettes, Christie W. Gordon, C. G. Hunter, M. T. I. Jones, Sung-Jui Liao, M. J. Lowther, J. P. P. Mackey, A. H. M. Richards, E. M. Rowland, Alice C. N. Swanston, G. H. Taylor, and John Watkins-Pitchford.

University of Edinburgh

At a graduation held on July 24 the following degrees diplomas were conferred:

M.D.—Ahmed El Shahed (in absentia), †James Innes, ‡R. J Rattrie, ‡J. S. Robson (in absentia), D. C. Rose, and ‡I. D. W (in absentia).

M.Ch.—§I. S. Smillie, O.B.E., and Robert Strang.

M.B., Ch.B.—Grace Barker, Patricia M. Barraclough, L. Batchelor, Margaret R. Bate, F. A. Beale, Fiona M. H. L. Binnie, W. L. Blackett, W. J. O. Box, *Mary M. M. E. R. Brooks, J. R. Brotherton, Joseph Brown, Pamela J. B S. P. Bruce, Mary C. Buchanan, Katharine A. Burn-Murd, James Burton, Alick Cameron, W. W. Campbell, I. W. Ca *Barbara E. Clayton, D. C. Cockburn, Iole L'E. K. de Lingen, A Douglas, David Duncan, J. A. Ewing, R. M. Foster, A. D Fotheringham, Robert Frater, E. N. S. Fry, K. G. Gadd, W. Galloway, Constance A. Gibbs, R. A. F. Gilbert, J. M. Gill, P Gillott, Philippa A. Glyn, Abraham Goldberg, R. H. Go Jessie E. J. Grainger, E. R. Gunn, Sheila I. Haldane, K. C Halliday, T. L. Henderson, J. S. Holden, Ronald Houston, Mo Hughes, Elizabeth S. Humble, R. C. Humphreys, Morag L. In A. S. Ireland, Gordon Irvine, A. B. Jamieson, D. A. L. Jones, J Kerr, Alison B. King, Isabella Kingan, Charlotte M. M. Kirk I. C. S. Knight, R. R. Lam, S. G. E. Laverty, Rosemary W. La rence, Isabel J. K. Ledger, Mary K. Lethem, I. C. Lewis, K. L P. D. Livingstone, Helenor F. Lochhead, *J. A. Loraine, Ethel M. J Loudon, A. C. M'Dougall, Margaret M. MacDougall, W. A. M dougall, P. C. MacGillivray, R. C. MacGillivray, D. M. Mac I. G. MacKenzie, D. L. MacKinnon, John MacLean, Alastair R. C. Macnair, Betty Mallace, Dilys Manners, T. S. Mart Matheson, Katherine-Alice Mercer, J. D. C. Millar, F. R. D. R. R. W. Mirrey, Irene M. J. Monaghan, Isobel S. Mowat, Elspet Orr, O. E. Owen, J. R. Page, H. M. Park, F. L. Rawson, Alex Reid, David Reid, M. V. Richards, Boris Ruebner, *W. R. St. C Kathleen I. Scott, Anne K. I. Sellers, W. L. Sewell, Hele Shearer, O. G. Sim, D. A. Sime, D. C. Simpson, Kenneth Sinc G. McM. Smibert, L. S. Smith, I. F. Sommerville, A. R. Som J. O. Taubman, Emily D. J. Todd, C. H. M. Walker, C. H. Wheat *Rachel B. White, J. W. Whittick, A. J. Williams, C. E. Willia A. T. Wilson, J. T. Wright, Duncan Yuille, and Monica M. Zeal

D.P.M.—J. B. Methven (in absentia).

D.T.M. & H.—William Bain, J. A. P. Bouton (in absent George Buchanan (in absentia), C. W. F. MacKay, J. P. Mehrot K. D. Moynagh, W. O. Petrie (in absentia), and J. M. Smith.

M.D. of the Polish School.—Kazimierz Durkacz, Lukasz K czycki, Magdalena K. Munk, Roman Rejthar, Olgierd Rymaszewsk T. J. Szczesniak, and Henryk Wójcicki.

M.B., Ch.B. of the Polish School.—Antoni Bobak, Wladys Galecki, Karol Getta, Zenon Giedrys, Eliasz Grubsztejn, Wojc Kaczmarek, Andrzej Kurowski, Tadeusz Labecki (in absent Zbigniew Liskowicz, Zbigniew Milowski, Liwia Mitis, Karol Sztab (in absentia), Leon Wachala, and Adam Wloczewski.

* With honours. † Highly commended. ‡ Commended.
§ Awarded gold medal.

The Cameron prize in practical therapeutics was award to Dr. Albert Szent-Györgyi, professor of medical and org chemistry in the University of Szeged, Hungary, in recog of his contributions to our knowledge of vitamin C.

University of Birmingham

The following appointments to full-time clinical ch have been announced: medicine, Dr. W. M. Arnott; sur Mr. F. A. R. Stammers; pædiatrics and child health, Dr M. Smellie; and obstetrics and gynæcology, Mrs. Hilda N. Ll Mrs. Lloyd was appointed to the chair of obstetrics gynæcology two years ago.

University of Leeds

Dr. H. V. Dicks has been appointed to a new full chair in psychiatry, and Dr. W. S. Craig to a new full chair in pædiatrics. New chairs have also been insti in chemical pathology, biochemistry, and pharmaco Dr. J. G. McCrie has been appointed to the new post of se administrative officer in the medical school.

University of Manchester

Prof. H. S. Raper, F.R.S., who has held the chair of ph logy in the university since 1923, has been appointed full dean of the medical school and professor of chemical physio from September next. Dr. Walter Schlapp, at present re in experimental physiology and assistant director of physiological laboratories, has been appointed Brackenb professor of physiology and director of the laboratories f September next, in succession to Professor Raper.

Dr. Schlapp, after serving in the Army during the war of 1914 entered the University of Edinburgh, where he graduated B.Sc chemistry in 1923 and obtained the degree of PH.D. in physiolog 1927. He qualified M.B. in 1930, and held a Carnegie res fellowship in Edinburgh, where he was a demonstrator in department of physiology. In 1930 he was appointed assis lecturer in pharmacology in the University of Manchester, later that year, lecturer in experimental physiology. In 193 was made assistant director of the physiological laboratories, this year was promoted to a readership. Since 1935 Dr. Schlapp been tutor and secretary to the faculty of medicine. His sp interests have been in the physiology of the central nervous sy and in endocrinology. He has published papers on gastric secr pituitary hormones, the actions of adrenaline, cardiac glyco blood chemistry, and electronic methods. His most recent w has been on pulse-wave velocity and auricular fibrillation.

niversity of Glasgow

Dr. R. A. Lennie has been appointed to the regius chair of idwifery in the university.

Born in 1889, Dr. Lennie was educated at Glasgow High School nd the University of Glasgow. Among the positions he has held e those of professor of midwifery and gynæcology, St. Mungo's ollege ; examiner for the fellowship and licence, Royal Faculty of hysicians and Surgeons ; gynæcologist, E.M.S. Hospital, Bangour ; nd foundation member and member of the first full council, Royal ollege of Obstetricians and Gynæcologists, 1929–34. He is senior bstetric surgeon to the Glasgow Royal Maternity and Women's ospital, and gynæcologist to the Victoria Infirmary, Glasgow. e is also lecturer in midwifery and examiner at the University of lasgow ; clinical examiner, University of Edinburgh ; examiner o the Central Midwives Board for Scotland ; and president of the lasgow Obstetrical Society. In 1945 Dr. Lennie retired with the onorary rank of colonel from the active list of the Territorial rmy, in which he had served since December, 1914. During the ar of 1914–18 he served with the 52nd Lowland Division in Galli-oli, Egypt, Palestine, and France, and in the late war he organised nd commanded for over two years a 600-bed base hospital in cottish Command. He is the author of numerous papers on bstetrical subjects, and is a council member of the St. Andrew's mbulance Association.

University of Dublin

Honorary degrees conferred on July 3 included that of M.D. for Sir Herbert Eason, president of the General Medical ouncil, and of D.SC. for Sir Alexander Fleming, F.R.S., rofessor of bacteriology in the University of London.

Royal College of Physicians of London

At a comitia of the college, held on July 25, with Lord Moran, the president, in the chair, the following fellows were elected officers for the ensuing year :

Censors : Dr. G. E. Ward, Dr. E. Bellingham Smith, Dr. William Johnson, and Sir Adolphe Abrahams. Treasurer : Prof. W. G. Barnard. Registrar : Dr. H. E. A. Boldero. Assistant Registrar : Dr. W. D. W. Brooks. Members of the library committee : Sir Archibald Gray, Dr. Macdonald Critchley, Prof. Edward Charles Dodds, F.R.S., and Prof. J. M. Mackintosh. Members of the finance committee : Dr. Maurice Campbell, Dr. J. L. Livingstone, and Dr. J. St. C. Elkington.

The following were elected examiners :

L.R.C.P.—Chemistry : Mr. Alexander Lawson, PH.D., and Mr. John Lowndes, F.R.I.C. Physics : Prof. Sidney Russ, D.SC., and Mr. J. H. Brinkworth, M.SC. Materia Medica and Pharmacology : Dr. E. C. Warner, Dr. H. L. Marriott, Dr. Wilfred Oakley, Prof. Noah Morris, and Dr. C. A. Keele. Physiology : Prof. Samson Wright, and Prof. Hamilton Hartridge, F.R.S. Anatomy : Prof. Thomas Nicol. Pathology : Dr. E. N. Chamberlain, Dr. R. J. Pulvertaft, Dr. Archibald Gilpin, nd Prof. W. D. Newcomb. Medical anatomy and principles and actice of medicine : Dr. George Hall, Dr. Geoffrey Bourne, Dr. Reginald Hilton, Dr. L. B. Cole, Dr. J. L. Livingstone, Dr. K. Shirley Smith, Dr. Maurice Shaw, Dr. W. E. Lloyd, Dr. A. M. Cooke, Dr. T. C. Hunt, Dr. J. C. Hawksley, and Dr. F. P. L. Lander. Midwifery and diseases peculiar to women : Mr. D. H. Macleod, Mr. C. M. Gwillim, Mr. H. L. Shepherd, Mr. J. E. Stacey, and Mr. G. F. Gibberd.

D.P.H.—Part I : Dr. M. E. Delafield. Part II : Dr. J. G. Wilson.

D.T.M. & H.—Section A : Major-General Sir Alexander Biggam. Section B : Prof. P. A. Buxton, F.R.S.

D.O.M.S.—Dr. S. P. Meadows.

D.P.M.—Part I : Dr. Desmond Curran. Part II : Prof. P. C. P. Cloake and Prof. A. J. Lewis.

D.L.O.—Mr. D. F. A. Neilson.

D.M.R.—Prof. W. V. Mayneord, D.SC., Dr. E. R. Williams, and Prof. B. W. Windeyer.

D.A.—Prof. R. R. Macintosh and Dr. A. S. Daly.

D.C.H.—Dr. W. G. Wyllie and Dr. A. G. Watkins.

D.P.M.—Part I : Mr. L. H. Clarke, PH.D., and Dr. H. A. Dunlop. Part II : Sir Robert Stanton Woods and Dr. W. S. C. Copeman.

D.I.H.—Part I : Dr. J. A. Charles. Part II : Dr. R. E. Lane.

Prof. W. E. Hume was elected representative of the college on the council of King's College, University of Durham. The following lecturers were appointed for 1947 : Dr. C. E. Lakin (Harveian orator), Dr. Janet Vaughan (Bradshaw cturer), Dr. F. Avery Jones (Goulstonian), Dr. J. P. Martin (Lumleian), Prof. F. C. Bartlett, F.R.S. (Oliver-Sharpey), Sir Arthur MacNalty (FitzPatrick), Mr. Harold Nicolson (Lloyd Roberts), and Prof. P. C. P. Cloake (Humphry Davy Rolleston).

The Murchison scholarship for 1946 was awarded to Dr. J. D. Judah.

The following, having satisfied the censors' board, were elected to the membership :

Raouf, Al-Mankabadi, M.B. Cairo ; C. D. Anderson, M.C., M.B. Camb. ; D. A. P. Anderson, M.B. Camb. ; Abd-el-Hamid Ata, M.B. Cairo ; D. A. Ballantyne, M.B. N.Z. ; H. S. Barber, M.D. Dubl. ; Gerhard Behr, L.R.C.P. ; R. C. S. Benson, M.B. Lond. ; T. S. L. Beswick, M.B. Camb. ; D. W. Beynon, M.B. Lond. ; E. J. Blair, M.D. Durh. ; Anne Bolton, M.B. Camb. ; N. R. Butler, M.B. Lond. ; J. E. Cates, M.D. Lond. ; F. E. de W. Cayley, M.B.E., L.R.C.P. ; Max Chitters, M.B. Witw'srand ; J. W. C. Cochrane, M.D. Witw'srand, M.B. Lond ; W. H. R. Cook, M.B. Lpool ; I. S. Dalton, M.B. Lond. ; H. E. De Wardener, M.B.E., M.B. Lond. ; R. C. S. Dick, M.B. Camb. ; Hugo Droller, M.D. Munich ; Margaret E. Edmunds, M.B. Lond. ; A. C. Elithorn, M.B. Camb. ; G. R. Fryers, M.B. Leeds ; W. R. Gauld, M.D. Aberd. ; J. A. L. Gilbert, M.B. Edin. ; Alexander Guedatarian, L.R.C.P. ; Michael Hamilton, M.B. Lond ; J. B. Heycock, L.R.C.P. ; G. E. Hosking, M.B. Lond. and Wales ; C. A. Houlder, M.B. Lond. ; A. M. Jelliffe, M.B. Lond. ; E. S. Jones, M.B. Lpool ; J. D. O. Kerr, M.B. Glasg. ; P. D. C. Kinmont, M.B.E., M.B. Lond. ; S. C. Kusumgar, M.B. Bombay ; J. W. Lacey, M.D. Camb. ; D. R. Laurence, M.B. Lond. ; Emil Leigh, M.D. Leeds ; D. C. Lewin, M.B. Lond. ; L. A. Liversedge, M.D. Duke, M.B. Manc. ; Gerard Lorriman, M.B.E., M.B. Durh. ; B. H. McCracken, M.D. Wisconsin, M.B. Wales., flying-officer R.A.F.V.R. ; A. J. S. McFadzean, M.B. Glasg. ; F. M. McGown, M.B. Camb. ; Gerald MacGregor, M.B. Lond., surgeon lieutenant R.N.V.R. ; K. S. MacLean, M.B. Camb. ; Mary L. Mittell, M.B. Lond. ; J. H. Moseley, M.B. Camb. ; Bernard Moshal, M.D. Dubl. ; P. B. L. Muldoon, M.B. N.U.I., major R.A.M.C. ; G. R. E. Naylor, M.B. Camb. ; C. S. Nicol, M.B. Lond. ; J. C. R. Nuttall-Smith, M.C., M.B. Camb. ; A. B. Pollard, M.B. Lond. ; B. W. Powell, M.B. Camb. ; S. B. Rampling, M.B. Manc., captain R.A.M.C. ; T. L. Reeves, M.B. Lond. ; Frank Robertson, M.D. Durh. ; G. R. Royston, M.D. Lond. ; K. J. Samson, M.D. Hamburg ; Robert Semple, M.B. Aberd. ; N. M. Shah, M.D. Bombay ; Sheila Sheehan, M.B. Dubl. ; J. R. Sinton, M.B. Lond. ; R. B. Sloane, M.B. Lond. ; David Stafford-Clark, M.B. Lond. ; R. P. Strang, L.R.C.P. ; J. A. Strong, M.B.E., M.B. Dubl. ; H. J. C. Swan, M.B. Lond. ; N. G. Talwalkar, M.D. Bombay ; P. E. R. Tattersall, M.B. Leeds ; D. C. Thursby-Pelham, L.R.C.P. ; Henryk Urich, M.B. Polish School of Medicine, Edin. ; G. C. Wells, M.B. Camb. ; D. A. J. Williamson, M.B. Lond. ; B. D. R. Wilson, M.B. Lond. ; and Clifford Wilson, D.M. Oxfd.

Licences to practise were conferred upon the following 118 candidates (91 men and 27 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the college :

A. R. L. Abel, Davida M. Adams, D. M. C. Ainscow, E. J. Allaway, Barbara M. Ansell, Constance M. A. Bachtin, Margaret E. Bailey, Stanley Balfour-Lynn, Joan A. Barrett, H. D. Beckett, E. I. Bieber, Donald Bigley, D. K. Briggs, R. H. Broughton, Harold Caplan, V. L. Cartledge, D. M. T. Cones, P. D. Crosbie, A. M. Davies, P. R. Davis, R. C. Davison, Rosemary Dearden, Mary M. Dickinson, Romola D. Dunsmore, D. R. Edwards, H. E. Ffoulkes, G. H. Fisher, D. P. Fitzgerald, Ian Fletcher, Frances M. Fountain, R. O. J. Fry, J. D. Fuller, B. D. Grant, Dora Green, H. G. Griffin, I. R. Haire, P. H. T. Hall, F. A. E. Hamilton, G. J. L. Hamilton, J. R. Handforth, J. J. Hopkinson, R. J. Howat, Edna G. Howe, Gough Hughes, G. C. Hunter, Ian Jackson, P. D. C. Jackson, Thomas Jackson, Glyndwr Jeffreys, N. B. Jetmalani, Robert John, J. W. G. Johnson, Catherine M. E. Jones, C. W. L. Jones, D. W. W. Jones, I. S. M. Jones, Thelma D. Jörgensen, R. S. Kagan, R. C. Keane, G. W. Korn, Marjorie A. C. Kuck, T. D. Lambert, Gertrude Latner, Kingsley Lawrance, R. M. H. Layland, M. B. Lennard, Cyril Levin, T. L. T. Lewis, R. I. T. Lindsay, Janet G. S. McDowall, E. P. Mackenzie, H. H. Margulies, Margaret A. Marten, T. C. H. Mathews, Gladys A. Meigh, G. S. Metters, J. R. Mikhail, Kate H. Miller, P. R. Miller, J. B. Moore, N. S. Moores, Marguerite F. E. Morford, C. P. Newcombe, William Nixon, J. A. Noblett, L. W. Oxenham, James Parkyn, John Pavey-Smith B. W. Perlow, J. I. Pugh, R. J. Randall, H. M. Rayner, G. A. Readett, Robert Renwick, Beatrice E. S. Richards, J. P. R. Richardson, J. F. S. Robertson, K. W. Robinson, H. E. Robson, P. N. Robson, Rosemary J. M. Rose, B. L. L. Rygate, Jutta Scharfstein, Desmond Seymour, B. E. Shairp, Dorothy M. Silvester, Patricia M. Stanwell, K. D. Stewart, Janet Sutherland, C. K. M. Thacker, Joan M. H. Thomas, John Thompson, Peter Timmis, Leon Walkden, R. W. W. Watson, F. E. Webb, A. A. Weyman, and J. L. Whitmore.

Diplomas in anæsthetics, in psychological medicine, and in laryngology were conferred on those named in reports from the Royal College of Surgeons in our issues of June 22 and July 20, and in tropical medicine and hygiene to those named in our issue of June 29, and to E. A. Lumley. Diplomas in public health were also conferred jointly with the Royal College of Surgeons on the following :

Jack Beeston, Phœbe Charlton, B. A. Coghlan, R. V. Coxon, Enid G. M. Cummings, H. S. Fraser, S. MacL. Frazer, A. A. Huse, J. P. Kennedy, A. A. Lewis, G. L. McLeod, Mary N. M. Paulin, Mary Roland, R. G. Samuel, E. L. Tee, and R. L. Worrall.

Scottish Conjoint Board

At recent examinations of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, the following were successful :

L.R.C.P. & S.E., L.R.F.P.S.

E. A. Barrett, W. R. Brown, W. S. Brown, Mary G. Buchanan, John Duncan, A. S. Dunn, Margaret W. Gerrard, R. F. Gray, Ian Lamond, G. A. Lawrenson, Julia I. Leitch, G. C. Mackie, Catherine H. Mair, H. M. Mann, Jeannette B. Morrison, N. A. Oppenheim, A. C. Pole, J. L. Quartey-VanderPuije, J. N. Rankin, B. W. T. Richardson, H. K. Rose, Agnes W. M. Scott, Kirsty F. Semple, W. P. Thomson, John Watson, A. J. Williams.

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college on July 16, Dr. D. M. Lyon, the president, intimated that the following had accepted honorary fellowship :

Major-General Sir Alexander Biggam, Sir Henry Dale, O.M., F.R.S., Prof. N. Hamilton Fairley, F.R.S., Sir Alexander Fleming, F.R.S., Sir John Fraser, Lord Moran, P.R.C.P., and Major-General Sir Percy Tomlinson.

Dr. R. H. Girdwood (Edinburgh), Dr. A. H. Campbell (Redhill), and Dr. S. G. Graham (Glasgow) were introduced and took their seats as fellows of the college. Major William Happer, Dr. R. J. Kellar (Edinburgh), Dr. G. D. Malcolm (Bridge of Earn), and Sir Andrew Davidson (Edinburgh), were elected fellows.

Notes and News

L.C.C. HOSPITAL COMMITTEES

At the outbreak of war the monthly meetings of these hospital committees were temporarily suspended, and they are at present still only meeting four times a year. The council now proposes that after the holidays meetings should be held every two months, and they hope to reconsider the matter early next year. The orders of reference of the committees will be the same as before, including regular visits to the wards and inspection of diets, appointment of ladies' visiting committees, investigation of complaints by patients, examination of the hospital books, consideration of reports by the medical superintendent and other senior officers, approval of requisitions for supplies, appointment and promotion of certain grades of staff, disposal of small gifts of money, and consideration of works for inclusion in the annual maintenance estimates. Before the war the committees also dealt with the granting of special and casual leave and with discipline, but these matters are now reserved for the establishment and general purposes committees of the council where they will, at any rate for the present, remain.

So far the hospital committees have dealt only with administrative matters not involving expenditure. The council now proposes to authorise them to sanction expenditure for annual amounts, varying from £200 for larger hospitals to £50 for smaller hospitals. They will be allowed to spend money on small improvements, such as bookcases or electrical equipment for patients or staff, and on the provision of additional amenities, such as furniture or pictures. These changes are part of the council's policy of "strengthening the individuality of each hospital without prejudice to its efficient administration as an integral part of a large service."

BIRTHS AND MARRIAGES

Live births in England and Wales during the June quarter of this year totalled 203,797, which represents a birth-rate of 19·2—the highest in any quarter since June, 1925. In the previous quarter, ended March 31, the number of births was 181,445; this exceeded deaths by 26,292. Infant mortality in the March quarter was 55 per thousand related live births—14 per 1000 below the average of the preceding ten March quarters and 4 below the March quarter, 1945. The number of illegitimate births—14,577—was 3061 fewer than in the corresponding period last year. Marriages totalled 77,480—an increase of 866 over the March quarter a year ago, but 3360 fewer than the average for the March quarters of the years 1940–44. These figures are given in the Registrar-General's Return for the March quarter, obtainable from H.M. Stationery Office at 6*d*.

University of London

Dr. N. Hamilton Fairley, F.R.S., has been appointed to the Wellcome chair of tropical medicine tenable at the London School of Hygiene and Tropical Medicine, from Oct. 1 next. Dr. George Macdonald, whose appointment as director of the Ross Institute of Tropical Medicine was announced last December, has been appointed to the university chair of tropical hygiene tenable at the London School of Hygiene and Tropical Medicine, from Oct. 1 next.

Dr. F. C. O. Valentine has been appointed to the university readership in chemotherapy tenable at the London Hospital Medical College, from Oct. 1 next. The title of professor of morbid anatomy and histology has been conferred on Dr. R. W. Scarff, in respect of the post held by him at the Middlesex Hospital Medical School.

The title of professor emeritus of helminthology has been conferred on Prof. R. T. Leiper, F.R.S., who retires in September from the William Julien Courtauld chair of helminthology at the London School of Hygiene and Tropical Medicine, which he has held since 1917. The title of professor emeritus of experimental pathology has been conferred on Prof. E. L. Kennaway, F.R.S., who retires in September from the chair of experimental pathology at the Chester Beatty Research Institute of the Royal Cancer Hospital, which he has held since 1931.

At a recent examination for the academic postgraduate diploma in public health the following candidates from the London School of Hygiene were successful:

S. G. Abelson, Olatunji Adeniyi-Jones, Alexander Anderson, A. E. Brown, J. M. Brown, E. J. Bury, A. L. Cochrane, W. C. Cockburn, E. R. Dansie, R. D. Dewar, W. Y. Fettes, Christie W. Gordon, C. G. Hunter, M. T. I. Jones, Sung-Jui Liao, M. J. Lowther, J. P. P. Mackey, A. H. M. Richards, E. M. Rowland, Alice C. N. Swanston, G. H. Taylor, and John Watkins-Pitchford.

University of Edinburgh

At a graduation held on July 24 the following degrees diplomas were conferred:

M.D.—Ahmed El Shabed (in absentia), †James Innes, ‡R. J. Rattrie, ‡J. S. Robson (in absentia), D. C. Ross, and ‡I. D. W (in absentia).

M.Ch.—§I. S. Smillie, O.B.E., and Robert Strang.

M.B., Ch.B.—Grace Barker, Patricia M. Barraclough, F. L. Batchelor, Margaret R. Bate, F. A. Beale, Fiona M. H. L. Binnie, W. L. Blackett, W. J. O. Box, *Mary M. M. E. R. Brooks, J. R. Brotherton, Joseph Brown, Pamela J. S. P. Bruce, Mary C. Buchanan, Katharine A. Burn-Mu James Burton, Alick Cameron, W. W. Campbell, I. W. C *Barbara E. Clayton, D. C. Cockburn, Iole L'E. K. de Lingen, Douglas, David Duncan, J. A. Ewing, R. M. Foster, A. D Fotheringham, Robert Frater, E. N. S. Fry, K. G. Gadd, W. Galloway, Constance A. Gibbs, R. A. F. Gilbert, J. M. Gill, Gillott, Philippa A. Glyn, Abraham Goldberg, R. H. G Jessie E. J. Grainger, E. R. Gunn, Sheila I. Haldane, E. C. Halliday, T. L. Henderson, J. S. Holden, Ronald Houston, M Hughes, Elizabeth S. Humble, R. C. Humphreys, Morag L. In A. S. Ireland, Gordon Irvine, A. B. Jamieson, D. A. L. Jones, J. Kerr, Alison B. King, Isabella Kingan, Charlotte M. M. Kirk I. C. S. Knight, R. R. Lam, S. G. E. Laverty, Rosemary W. Lawrence, Isabel J. K. Ledger, Mary K. Lethem, I. C. Lewis, K. L. P. D. Livingstone, Helenor F. Lochhead, *J. A. Loraine, Ell Loudon, A. C. M'Dougall, Margaret M. MacDougall, W. Macdougall, P. O. MacGillivray, R. C. MacGillivray, D. M. I. G. MacKenzie, D. L. MacKinnon, John MacLean, Alastair R. O. Macnair, Betty Mallace, Dilys Manners, T. S. Martin, Matheson, Katherine-Alice Mercer, J. D. C. Millar, F. R. D. R. R. W. Mirrey, Irene M. J. Monaghan, Isobel S. Mowat, Orr, O. E. Owen, J. R. Page, H. M. Park, F. L. Rawson, Reid, David Reid, M. V. Richards, Boris Ruebner, *W. R. St. C Kathleen I. Scott, Anne K. I. Sellers, W. L. Sewell, Hele Shearer, C. G. Sim, D. A. Sime, D. C. Simpson, Kenneth G. McM. Smibert, L. S. Smith, I. F. Sommerville, A. R. J. O. Taubman, Emily D. J. Todd, C. H. M. Walker, C. H. Wheat *Rachel B. White, J. W. Whittick, A. J. Williams, C. E. Will A. T. Wilson, J. T. Wright, Duncan Yuille, and Monica M. Zeal.

D.P.M.—J. B. Methven (in absentia).

D.T.M. & H.—William Bain, J. A. P. Bouton (in absent George Buchanan (in absentia), C. W. F. MacKay, J. P. Mehr K. D. Moynagh, W. O. Petrie (in absentia), and J. M. Smith.

M.D. of the Polish School.—Kazimierz Durkacz, Lukasz K czycki, Magdalena K. Munk, Roman Rejthar, Olgierd Rymasz T. J. Szczesniak, and Henryk Wójcicki.

M.B., Ch.B. of the Polish School.—Antoni Bobak, Wi Galecki, Karol Getta, Zenon Giedrys, Eliasz Grubsztejn, Wojci Kaczmarek, Andrzej Kurowski, Tadeusz Labecki (in absenti Zbigniew Liskowicz, Zbigniew Milowski, Liwia Mitis, Karol S (in absentia), Leon Wachala, and Adam Wloczewski.

* With honours. † Highly commended. ‡ Commended.
§ Awarded gold medal.

The Cameron prize in practical therapeutics was awar to Dr. Albert Szent-Györgyi, professor of medical and org chemistry in the University of Szeged, Hungary, in of his contributions to our knowledge of vitamin C.

University of Birmingham

The following appointments to full-time clinical c have been announced: medicine, Dr. W. M. Arnott; surg Mr. F. A. R. Stammers; pædiatrics and child health, Dr M. Smellie; and obstetrics and gynæcology, Mrs. Hilda N. Ll Mrs. Lloyd was appointed to the chair of obstetrics gynæcology two years ago.

University of Leeds

Dr. H. V. Dicks has been appointed to a new full chair in psychiatry, and Dr. W. S. Craig to a new full chair in pædiatrics. New chairs have also been instit in chemical pathology, biochemistry, and pharmacol Dr. J. G. McCrie has been appointed to the new post of administrative officer in the medical school.

University of Manchester

Prof. H. S. Raper, F.R.S., who has held the chair of ph logy in the university since 1923, has been appointed dean of the medical school and professor of chemical ph from September next. Dr. Walter Schlapp, at present re in experimental physiology and assistant director of physiological laboratories, has been appointed Brackenb professor of physiology and director of the laboratories f September next, in succession to Professor Raper.

Dr. Schlapp, after serving in the Army during the war of 1914-1 entered the University of Edinburgh, where he graduated B.Sc. chemistry in 1923 and obtained the degree of PH.D. in physiolog 1927. He qualified M.B. in 1930, and held a Carnegie resea fellowship in Edinburgh, where he was a demonstrator in department of physiology. In 1930 he was appointed as lecturer in pharmacology in the University of Manchester, later that year, lecturer in experimental physiology. In 1939 was made assistant director of the physiological laboratories, this year was promoted to a readership. Since 1935 Dr. Schlapp been tutor and secretary to the faculty of medicine. His spec interests have been in the physiology of the central nervous syst and in endocrinology. He has published papers on gastric secre pituitary hormones, the actions of adrenaline, cardiac glycosi blood chemistry, and electronic methods. His most recent w has been on pulse-wave velocity and auricular fibrillation.

iversity of Glasgow

)r. R. A. Lennie has been appointed to the regius chair of lwifery in the university.

3orn in 1889, Dr. Lennie was educated at Glasgow High School l the University of Glasgow. Among the positions he has held those of professor of midwifery and gynæcology, St. Mungo's lege; examiner for the fellowship and licence, Royal Faculty of rsicians and Surgeons; gynæcologist, E.M.S. Hospital, Bangour; l foundation member and member of the first full council, Royal lege of Obstetricians and Gynæcologists, 1929–34. He is senior stetric surgeon to the Glasgow Royal Maternity and Women's spital, and gynæcologist to the Victoria Infirmary, Glasgow. is also lecturer in midwifery and examiner at the University of isgow; clinical examiner, University of Edinburgh; examiner the Central Midwives Board for Scotland; and president of the asgow Obstetrical Society. In 1945 Dr. Lennie retired with the norary rank of colonel from the active list of the Territorial my, in which he had served since December, 1914. During the ır of 1914–18 he served with the 52nd Lowland Division in Galli-ll, Egypt, Palestine, and France, and in the late war he organised d commanded for over two years a 600-bed base hospital in ottish Command. He is the author of numerous papers on stetrical subjects, and is a council member of the St. Andrew's nbulance Association.

niversity of Dublin

Honorary degrees conferred on July 3 included that of .D. for Sir Herbert Eason, president of the General Medical ouncil, and of D.SC. for Sir Alexander Fleming, F.R.S., rofessor of bacteriology in the University of London.

oyal College of Physicians of London

At a comitia of the college, held on July 25, with Lord loran, the president, in the chair, the following fellows were lected officers for the ensuing year:

Censors: Dr. G. E. Ward, Dr. E. Bellingham Smith, Dr. Tilliam Johnson, and Sir Adolphe Abrahams. Treasurer: Prof. '. G. Barnard. Registrar: Dr. H. E. A. Boldero. Assistant legistrar: Dr. W. D. W. Brooks. Members of the library committee: Sir Archibald Gray, Dr. Macdonald Critchley, Prof. Edward harles Dodds, F.R.S., and Prof. J. M. Mackintosh. Members of he finance committee: Dr. Maurice Campbell, Dr. J. L. Livingstone, nd Dr. J. St. C. Elkington.

The following were elected examiners:

L.R.C.P.—Chemistry: Mr. Alexander Lawson, PH.D., and Mr. John owndes, F.R.I.C. Physics: Prof. Sidney Russ, D.SC., and Mr. J. H. 3rinkworth, M.SC. Materia Medica and Pharmacology: Dr. E. C. Varner, Dr. H. L. Marriott, Dr. Wilfred Oakley, Prof. Noah Morris, and)r. C. A. Keele. Physiology: Prof. Samson Wright, and Prof. Hamilon Hartridge, F.R.S. Anatomy: Prof. Thomas Nicol. Pathology:)r. E. N. Chamberlain, Dr. R. J. Pulvertaft, Dr. Archibald Gilpin, nd Prof. W. D. Newcomb. Medical anatomy and principles and actice of medicine: Dr. George Hall, Dr. Geoffrey Bourne, Dr. Reginald Hilton, Dr. L. B. Cole, Dr. J. L. Livingstone, Dr. K. Shirley Smith, Dr. Maurice Shaw, Dr. W. E. Lloyd, Dr. A. M. Cooke, Dr. T. C. Hunt, Dr. J. C. Hawksley, and Dr. F. P. L. Lander. Midwifery and diseases peculiar to women: Mr. D. H. Macleod, Mr. C. M. Gwillim, Mr. H. L. Shepherd, Mr. J. E. Stacey, and Mr. G. F. Gibberd.

D.P.H.—Part I: Dr. M. E. Delafield. Part II: Dr. J. G. Wilson.

D.T.M. & H.—Section A: Major-General Sir Alexander Biggam. Section B: Prof. P. A. Buxton, F.R.S.

D.O.M.S.—Dr. S. P. Meadows.

D.P.M.—Part I: Dr. Desmond Curran. Part II: Prof. P. C. P. Cloake and Prof. A. J. Lewis.

D.L.O.—Mr. D. F. A. Neilson.

D.M.R.—Prof. W. V. Mayneord, D.SC., Dr. E. R. Williams, and Prof. B. W. Windeyer.

D.A.—Prof. R. R. Macintosh and Dr. A. S. Daly.

D.C.H.—Dr. W. G. Wyllie and Dr. A. G. Watkins.

D.P.M.—Part I: Mr. L. H. Clarke, PH.D., and Dr. H. A. Dunlop. Part II: Sir Robert Stanton Woods and Dr. W. S. C. Copeman.

D.I.H.—Part I: Dr. J. A. Charles. Part II: Dr. R. E. Lane.

Prof. W. E. Hume was elected representative of the college on the council of King's College, University of Durham. The following lecturers were appointed for 1947: Dr. C. E. Lakin (Harveian orator), Dr. Janet Vaughan (Bradshaw lecturer), Dr. F. Avery Jones (Goulstonian), Dr. J. P. Martin (Lumleian), Prof. F. C. Bartlett, F.R.S. (Oliver-Sharpey), Sir Arthur MacNalty (FitzPatrick), Mr. Harold Nicolson (Lloyd Roberts), and Prof. P. C. P. Cloake (Humphry Davy Rolleston).

The Murchison scholarship for 1946 was awarded to Dr. J. D. Judah.

The following, having satisfied the censors' board, were elected to the membership:

Raouf, Al-Mankabadi, M.B. Cairo; C. D. Anderson, M.C., M.B. Camb.; D. A. P. Anderson, M.B. Camb.; Abd-el-Hamid Ata, M.B. Cairo; D. A. Ballantyne, M.B. N.Z.; H. S. Barber, M.D. Dubl.; Gerhard Behr, L.R.C.P.; R. C. S. Benson, M.B. Lond.; T. S. L. Beswick, M.B. Camb.; D. W. Beynon, M.B. Lond.; E. J. Blair, M.D. Durh.; Anne Bolton, M.B. Camb.; N. R. Butler, M.B. Lond.; J. E. Cates, M.D. Lond.; F. E. de W. Cayley, M.B.E., L.R.C.P.; Max Chitters, M.B. Witw'srand; J. W. C. Cochrane, M.D. Witw'srand, M.B. Lond; W. H. R. Cook, M.B. Lpool; I. S. Dalton, M.B. Lond.; H. E. De Wardener, M.B.E., M.B. Lond.; R. C. S. Dick, M.B. Camb.; Hugo Droller, M.D. Munich; Margaret E. Edmunds, M.B. Lond.; A. C. Elithorn, M.B. Camb.; G. R. Fryers, M.B. Leeds; W. R. Gauld, M.D. Aberd.; J. A. L. Gilbert, M.B. Edin.; Alexander Guedatarian, L.R.C.P.; Michael Hamilton, M.B. Lond; J. B. Heycock, L.R.C.P.; G. E. Hosking, M.B. Lond. and Wales; C. A. Houlder, M.B. Lond.; A. M. Jelliffe, M.B. Lond.; E. S. Jones, M.B. Lpool; J. D. O. Kerr, M.B. Glasg.; P. D. C. Kinmont, M.B.E., M.B. Lond.; S. C. Kusumgar, M.B. Bombay; J. W. Lacey, M.D. Camb.; D. R. Laurence, M.B. Lond.; Emil Leigh, M.D. Leeds; D. C. Lewin, M.B. Lond.; L. A. Liversedge, M.D. Duke, M.B. Manc.; Gerard Lorriman, M.B.E., M.B. Durh.; B. H. McCracken, M.D. Wisconsin, M.B. Wales., flying-officer R.A.F.V.R.; A. J. S. McFadzean, M.B. Glasg.; F. M. McGown, M.B. Camb.; Gerald MacGregor, M.B. Lond., surgeon lieutenant R.N.V.R.; K. S. MacLean, M.B. Camb.; Mary L. Mittell, M.B. Lond.; J. H. Moseley, M.B. Camb.; Bernard Moshal, M.D. Dubl.; P. B. L. Muldoon, M.B. N.U.I., major R.A.M.C.; G. R. E. Naylor, M.B. Camb.; C. S. Nicol, M.B. Lond.; J. C. R. Nuttall-Smith, M.C., M.B. Camb.; A. B. Pollard, M.B. Lond.; B. W. Powell, M.B. Camb.; S. B. Rampling, M.B. Manc., captain R.A.M.C.; T. L. Reeves, M.B. Lond.; Frank Robertson, M.D. Durh.; G. R. Royston, M.D. Lond.; K. J. Samson, M.D. Hamburg; Robert Semple, M.B. Aberd.; N. M. Shah, M.D. Bombay; Sheila Sheehan, M.B. Dubl.; J. R. Sinton, M.B. Lond.; R. B. Sloane, M.B. Lond.; David Stafford-Clark, M.B. Lond.; R. P. Strang, L.R.C.P.; J. A. Strong, M.B.E., M.B. Dubl.; H. J. C. Swan, M.B. Lond.; N. G. Talwalkar, M.D. Bombay; P. E. R. Tattersall, M.B. Leeds; D. C. Thursby-Pelham, L.R.C.P.; Henryk Urich, M.B. Polish School of Medicine, Edin.; G. C. Wells, M.B. Camb.; D. A. J. Williamson, M.B. Lond.; B. D. R. Wilson, M.B. Lond.; and Clifford Wilson, D.M. Oxfd.

Licences to practise were conferred upon the following 118 candidates (91 men and 27 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the college:

A. R. L. Abel, Davida M. Adams, D. M. C. Ainscow, E. J. Allaway, Barbara M. Ansell, Constance M. A. Bachtin, Margaret E. Bailey, Stanley Balfour-Lynn, Joan A. Barrett, H. D. Beckett, E. I. Bieber, Donald Bigley, D. K. Briggs, R. H. Broughton, Harold Caplan, V. L. Cartledge, D. M. T. Cones, P. D. Crosbie, A. M. Davies, P. R. Davis, R. C. Davison, Rosemary Dearden, Mary M. Dickinson, Romola D. Dunsmore, D. R. Edwards, H. E. Ffoulkes, G. H. Fisher, D. P. Fitzgerald, Ian Fletcher, Frances M. Fountain, R. O. J. Fry, J. D. Fuller, B. D. Grant, Dora Green, H. G. Griffin, I. R. Haire, P. H. T. Hall, F. A. E. Hamilton, G. J. L. Hamilton, J. R. Handforth, J. J. Hopkinson, R. J. Howat, Edna G. Howe, Gough Hughes, G. C. Hunter, Ian Jackson, P. D. C. Jackson, Thomas Jackson, Glyndwr Jeffreys, N. B. Jetmalani, Robert John, J. W. G. Johnson, Catherine M. E. Jones, C. W. L. Jones, D. W. W. Jones, I. S. M. Jones, Thelma D. Jörgensen, R. S. Kagan, R. C. Keane, G. W. Korn, Marjorie A. C. Kuck, T. D. Lambert, Gertrude Latner, Kingsley Lawrance, R. M. H. Layland, M. B. Lennard, Cyril Levin, T. L. T. Lewis, R. I. T. Lindsay, Janet G. S. McDowall, E. P. Mackenzie, H. H. Margulies, Margaret A. Marten, T. C. H. Mathews, Gladys A. Meigh, G. S. Metters, J. R. Mikhail, Kate H. Miller, P. R. Miller, J. B. Moore, N. S. Moores, Marguerite F. E. Morford, C. P. Newcombe, William Nixon, J. A. Noblett, L. W. Oxenham, James Parkyn, John Pavey-Smith, B. W. Perlow, J. I. Pugh, R. J. Randall, H. M. Rayner, G. A. Readett, Robert Renwick, Beatrice E. S. Richards, J. P. R. Richardson, J. F. S. Robertson, K. W. Robinson, H. E. Robson, P. N. Robson, Rosemary J. M. Rose, B. L. L. Rygate, Jutta Scharfstein, Desmond Seymour, B. E. Shairp, Dorothy M. Silvester, Patricia M. Stanwell, K. D. Stewart, Janet Sutherland, C. K. M. Thacker, Joan M. H. Thomas, John Thompson, Peter Timmis, Leon Walkden, R. W. W. Watson, F. E. Webb, A. A. Weyman, and J. L. Whitmore.

Diplomas in anæsthetics, in psychological medicine, and in laryngology were conferred on those named in reports from the Royal College of Surgeons in our issues of June 22 and July 20, and in tropical medicine and hygiene to those named in our issue of June 29, and to E. A. Lumley. Diplomas in public health were also conferred jointly with the Royal College of Surgeons on the following:

Jack Beeston, Phœbe Charlton, B. A. Coghlan, R. V. Coxon, Enid G. M. Cummings, H. S. Fraser, S. MacL. Frazer, A. A. Huse, J. P. Kennedy, A. A. Lewis, G. L. McLeod, Mary N. M. Paulin, Mary Roland, R. G. Samuel, E. L. Tee, and R. L. Worrall.

Scottish Conjoint Board

At recent examinations of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, the following were successful:

L.R.C.P. & S.E., L.R.F.P.S.

E. A. Barrett, W. R. Brown, W. S. Brown, Mary G. Buchanan, John Duncan, A. S. Dunn, Margaret W. Gerrard, R. F. Gray, Ian Lamond, G. A. Lawrenson, Julia I. Leitch, G. C. Mackie, Catherine H. Mair, H. M. Mann, Jeannette B. Morrison, N. A. Oppenheim, A. C. Pole, J. L. Quartey-VanderPuije, J. N. Rankin, B. W. T. Richardson, H. K. Rose, Agnes W. M. Scott, Kirsty F. Semple, W. P. Thomson, John Watson, A. J. Williams.

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college on July 16, Dr. D. M. Lyon, the president, intimated that the following had accepted honorary fellowship:

Major-General Sir Alexander Biggam, Sir Henry Dale, O.M., F.R.S., Prof. N. Hamilton Fairley, F.R.S., Sir Alexander Fleming, F.R.S., Sir John Fraser, Lord Moran, P.R.C.P., and Major-General Sir Percy Tomlinson.

Dr. R. H. Girdwood (Edinburgh), Dr. A. H. Campbell (Redhill), and Dr. S. G. Graham (Glasgow) were introduced and took their seats as fellows of the college. Major William Happer, Dr. R. J. Kellar (Edinburgh), Dr. G. D. Malcolm (Bridge of Earn), and Sir Andrew Davidson (Edinburgh), were elected fellows.

Royal College of Surgeons of Edinburgh

At a meeting of the college on July 25, with Mr. J. M. Graham, the president, in the chair, the following were admitted to the fellowship:

R. D. I. Beggs, m.b. Camb.; H. W. Gallagher, m.b. Belf.; G. C. Gordon, m.b. Glasg.; D. B. Handelman, l.r.c.p.e.; R. W. B. Holland, m.b. Edin.; C. M. Hopkins, m.b. Melb., m.r.c.o.g.; Philip Jardine, l.r.c.p.e.; J. P. Lane, m.b., n.u.i.; T. J. McCormac, m.b. n.z.; Matthew McLearie, m.b. Glasg.; A. M. Millar, m.b. Melb.; G. H. Moore, m.b. Manc.; J. F. Paxton, m.b. Camb.; H. H. Pearson, m.b. Sydney; N. A. Punt, m.r.c.s.; Sidney Sacks, m.b. Cape Town; D. G. Simpson, m.b. n.z.; W. M. Van Essen, m.r.c.s.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council on July 27, with Mr. Eardley Holland, the president, in the chair, Mr. William Gilliatt was elected president to take office in September next. Mr. R. M. Allan and Sir William Fletcher Shaw were elected vice-presidents.

The following were elected to the membership:

H. R. Arthur, S. J. Barr, B. E. Blair, Catherine I. Blyth, Joyce M. Burt, Harold Burton, G. B. W. Fisher, B. G. Halder, R. L. Hartley, Derek Jefferiss, Iola L. T. Jones, L. W. Lauste, Elizabeth McCallum, Margaret Orford, H. C. Perry, D. L. Poddar, Esther M. Pollock, J. E. Scott-Carmichael, W. R. Sloan, R. A. R. Taylor, E. W. L. Thompson, T. G. E. White.

Society of Medical Officers of Health

The county-borough group held its annual meeting from July 19 to 22 at Eastbourne under the presidency of Dr. R. H. H. Jolly. Dr. W. S. Walton, newly appointed m.o.h. for Newcastle-upon-Tyne, was elected president for the coming year. The secretary is Dr. J. Greenwood Wilson. Among the addresses given was one by Dr. Scott Williamson on the work of the Peckham Pioneer Health Centre from its foundation. Many members said they would do their best to promote similar centres in their own areas. Dr. F. Fenton, m.o.h. for Eastbourne, in a paper on the Care of Homeless Children, stressed the need for coördination of their care through the person of the medical officer of health. The group resolved to recommend that this policy should be advocated by the council of the society. Prof. J. M. Mackintosh, in an address which stirred his hearers, outlined his ideas for the training of medical administrators.

Royal Medico-Psychological Association

At the annual dinner of this association, held at the Royal College of Physicians of Edinburgh on July 17, Prof. D. Murray Lyon, president of the college, proposed the toast of The Association. One of the features of old Edinburgh, he recalled, had been the multiplicity of clubs and societies. Some were designed for mutual protection of their members, some for mutual improvement and education, and some for purely social purposes. He was glad to see that the Royal Medico-Psychological Association successfully fulfilled all these functions. In his reply Prof. D. K. Henderson, the president, urged the members to keep their minds on the future, but also asked them to remember to pay tribute to many men and women who were not themselves psychiatrists, or even doctors, but had been pioneers in mental health. William Tuke, Elizabeth Fry, Octavia Hill, and Florence Nightingale, by their intelligence and diligence and far-sightedness had advanced tremendously the cause for which they all stood. He recalled also two Americans: Dorothea Dix came to Edinburgh in 1855 and it was through her initiative that the present system of mental hospitals was begun in Scotland; Clifford Beers founded in 1907 the Connecticut Society for the Development of Mental Hygiene, a step in the evolution of the mental services whose significance could not be exaggerated. Professor Henderson thought it very important that psychiatrists should work in close touch with intelligent laymen. He wished to express publicly the appreciation of all physician-superintendents of mental hospitals, like himself, for the wholehearted voluntary work and coöperation of their boards of management, and he emphasised the value of the voluntary system in hospital management in general, but particularly in relation to mental hospitals. The toast of The City of Edinburgh was proposed by Dr. W. S. Maclay, and in his reply Sir John Falconer, lord provost, spoke particularly of the work which psychiatrists were doing in the study of psychosomatic disorders and in child guidance. The child-guidance clinic recently set up by the Edinburgh corporation was giving most encouraging results. Dr. W. M. McAllister's proposal of The Guests brought replies from Lord Cooper (Lord Justice Clerk) and Sir William Darling, m.p.

Beit Memorial Fellowships

Sir John Anderson, f.r.s., and Sir Henry Dale, o.m., f. have been elected trustees of the fund. The following aw have been made:

FOURTH YEAR FELLOWSHIPS

G. J. Popják, m.d. *To study the behaviour of plasma t under different experimental conditions and the problem of fat metabolism. At the department of pathology, St. Tho Hospital, London.*

Ethel G. Teece, ph.d. To study the chemistry of bact. polysaccharides and nucleoproteins with special reference to Gram complex and to the factors responsible for cell division. the department of chemistry, University of Birmingham.

JUNIOR FELLOWSHIPS

S. E. Dicker, m.d., ph.d. To study the extrarenal water m bolism and renal function in rats. At the department of pharma logy, University of Bristol.

P. M. Tow, m.b. To study prefrontal leucotomy and the funct of the frontal area. At the research department, Runwell Hosp. for Nervous and Mental Diseases.

Royal Appointments

Major-General J. C. A. Dowse, c.b., c.b.e., m.c., m late r.a.m.c., has been appointed honorary physician The King in succession to Brigadier H. A. Sandiford a Major-General E. A. Sutton, o.b.e., m.c., late r.a.m.c., honor surgeon in succession to Major-General G. A. Blake.

World Federation of Scientists.—This federation o its foundation to the Association of Scientific Workers, a to the British Association as stated on p. 146 of our last issu

In the article by Dr. K. B. Rogers (July 20, p. 87) "*Stap pyogenes*" should read "*Strep. pyogenes.*"

Medical Diary

Aug. 4–10

Thursday, 8th

Medical Society of the L.C.C. Service

3 p.m. (Hammersmith Hospital, Ducane Road, W.12.) Clinic meeting.

Births, Marriages, and Deaths

BIRTHS

Cobbe.—On July 24, the wife of Dr. C. J. Cobbe, m.b.e.—a son.

Cust.—On July 21, the wife of Dr. Norman Cust, of Elvaston Pla S.W.7—a daughter.

Fraser.—On July 7, at Bermuda, the wife of Surgeon Command P. K. Fraser, r.n.—a daughter.

Longmore.—On July 29, in Oxford, the wife of Dr. J. B. Longm —a daughter.

MARRIAGES

Colebrook—Scovell.—On July 26, at Birmingham, Leon Colebrook, f.r.c.o.g., f.r.s., to Vera, widow of Edward Scov

Hewat—Boyd-Perkins.—On July 27, in London, Rich Middleton Hewat, m.r.c.s., wing-commander r.a.f., Kathleen Mary Boyd-Perkins, p.m.r.a.f.n.s.r.

Reid—Pedler.—On July 25, in London, Douglas Andrew Campb Reid, m.r.c.s., to Margaret Joyce Pedler, m.b.

DEATHS

Aldred-Brown.—On July 26, at Bath, George Ronald P Aldred-Brown, d.m. Oxfd.

Boeckx.—On July 22, in London, Ludovicus Cornelius Joseph Boeckx, m.d. Louvain, aged 71.

Colwell.—On July 22, at Bognor Regis, Hector Alfred Colw m.d., ph.d. Lond., m.r.c.p., aged 70.

Gemmill.—On July 28, in Birmingham, William Gemmill, m Edin., ch.m. Birm., f.r.c.s.

Hunter.—On July 24, at Bournemouth, Joseph Hunter, m.b. Dub surgeon major i.m.s. retd., of Londonderry, aged 95.

Jones.—On July 23, at Umzinto, Natal, Francis Samuel Jon m.r.c.s., aged 67.

Wilkinson.—On July 7, in Dublin, Thomas Biddulph Pilswor Wilkinson, m.b. r.u.i., formerly of Plymouth, aged 82.

. . . At present the G.M.C. consists of practising doct exactly as if the Prison Commissioners were practising burgl and murderers. It is a professional association of the wo type, a hundred years out of date scientifically. Its record infamous. . . . I must not cumber your columns with notori instances of its superstitions, its prolongation of expens medical apprenticeship by disheartening rubbish which t student has to unlearn or forget at the bedside, its ignora of the history of medical science, and its absurd amate statistics dating from a time when uncontrolled post h propter hoc inferences, and percentages based on two or th cases, passed as mathematical certainties. . . . I am too old keep hammering in the case I stated in my preface to *T Doctor's Dilemma.* All I can do, with your permission, is warn Mr. Bevan that if he does not make a clean sweep the doctors from the G.M.C. and a thorough revision of t curriculum there will be trouble for him which may run to breakdown of the Act.—Mr. Bernard Shaw, *Times,* July

EPIDEMIOLOGY AND THE PSYCHOSOMATIC AFFECTIONS *

A STUDY IN SOCIAL MEDICINE

James L. Halliday
M.D. Glasg., D.P.H.

> "Every personal problem is more than a personal problem; it is a communal one."
> "I never rightly understood—about that," murmured the shepherd.
> "Who does?" replied the philosopher, "after giving more years to it than I can remember, my own thoughts have become a little clear only to myself."—*The Serpent*, a novel, by Neil M. Gunn, 1943.

A STRIKING feature of the public health of the 20th century was the rising incidence of many psychosomatic affections. Concomitantly the incidence of hysteria seemingly declined. My purpose here is to draw attention to the epidemiological issues raised by these tendencies and to indicate their importance to social medicine.

The affections that showed a rising trend included not only the various bodily disturbances associated with states of anxiety or depression but also such defined organic diseases as gastritis, peptic ulcer, exophthalmic goitre, diabetes, "fibrositis," and the cardiovascular hypertensive disorders—notably coronary thrombosis, cerebral hæmorrhage, and the cardiovascular-renal syndrome. (These disease names may be regarded in many instances as referring to the structural end-results of prolonged psychophysiological dysfunction in specially predisposed individuals.)

In a previous study (Halliday 1945b) I analysed the statistical behaviour of these diseases in Britain in 1900–39 and remarked not only on their rising incidence but also on their greater frequency in urban than in rural areas and the differing incidence between various occupational groups and social classes. A description was also given of the "shift" in sex-incidence and in age-incidence that occurred during the period surveyed.

Origin of Upward Trend of Psychosomatic Organic Affections

When did the upward trend in these affections begin in Britain? The question cannot be answered directly, because official mortality-rates for the 19th century in respect of such diseases as duodenal ulcer, exophthalmic goitre, diabetes, and the hypertensive cardiovascular disorders are either not available or are not susceptible of interpretation. Some indication is perhaps provided by the birth-rate, an understanding of whose movements also requires account to be taken of psychological considerations. Indeed the birth-rate, together with the rates of the psychosomatic affections, would seem to provide a valuable index of the psychological health of a community (Halliday 1945a). Adopting this suggestion we might conjecture that the increase in the incidence-rates of the psychosomatic affections began contemporaneously with the decline in the birth-rate—i.e., round about 1870—as if at this period the operative effect of a growing noxious psychosocial environment were beginning to be revealed in vital statistics. That this date does represent a critical point in social history is the opinion of Trevelyan (1944).

> "One of the difficulties of an attempt to write the social as distinct from the political history of the nation is the absence of determining events and positive dates by which the course of things can be charted. The social customs of men and women and their economic circumstances, particularly in modern times, are always in movement, but they never change completely or all at once. The old overlaps the new so much that it is often a question whether to ascribe some tendency in thought or practice to one generation or the next. But on the whole the most marked changes of tendency in Victorian England may be ascribed to the later 'sixties and 'seventies."

The period 1860–70 also marked a definite change of tendency in the field of economics. According to Stark (1944) the year 1871 saw the climax in the evolution of "economic individualism." After this date "individual freedom in economic life became increasingly subjected to social limitations such as tariffs (to protect farmers), cartels (to protect manufacturers), and trade unions (to protect workers)."

It is therefore possible though by no means certain that the upward trend in the psychosomatic affections in Britain may have begun, or at least was under way, in the later '60's and '70's. With the quickening pace in "the course of things" during the 20th century, the rise became discernible in official statistics of morbidity and mortality, but it was not until after the first world war that certain of the affections—e.g., duodenal ulcer and the bodily disturbances of anxiety states—assumed almost epidemic form.

Epidemiological Approach

An epidemiological interpretation of the prevalence of any disease must take account of its ætiology. What is known of the biological ætiology of those psychosomatic organic diseases that show a rising frequency? In the ætiological field of the person a relevant characteristic is the presence of well-marked obsessional trends, the predisposition to these compulsive performances in daily routine being determined by excessive frustration of emotional development during the pregenital phases of early life.

Another relevant personality characteristic is a positive family history either of the same or of an associated affection. This does not necessarily imply that these disorders are genetically inherited, as the finding might equally be determined by the psychological influences of the parent on the child, inducing correspondences of function and dysfunction. Irrespective of these considerations, a rising incidence within the space of one or two generations could not be attributed to changes in the genetic inheritance unless there had been a concomitant alteration in British racial stock.

In the ætiological field of environment relevant precipitating factors are upsetting events or a disturbing life situation. When therefore we find, after due statistical correction has been made, that the incidence of certain psychosomatic affections is increasing, we should expect as a reasonable inference from our ætiological knowledge that this could be attributed to (1) an *increase in predisposition* associated with changes in the milieu of infancy, and/or (2) an *increase in precipitating situations* associated with changes in the milieu of adulthood.

The changes in the milieu of infancy inducing increased predisposition would require to be of a kind that increasingly frustrated, both extensively and intensively, emotional development in the pregenital phases. As a corollary each succeeding generation of adults would be both somatically more sensitive to emotionally disturbing events and in their personality types more "obsessional" than their parents. The changes in the milieu of adulthood inducing an increase of precipitating situations would require to be of a kind that increasingly provoked, both extensively and intensively, disturbing emotional reactions, such as anxiety, insecurity, exasperation, resentment, and isolation.

---

* It has been lightly said that "all diseases are psychosomatic," but assuredly all diseases are not *psychosomatic affections*. These disorders show a number of interesting characteristics that distinguish them from illnesses in other broad ætiological categories, such as the infectious diseases, injuries, disorders of nutrition, &c., in virtue of which they may be said to possess a common form (Halliday 1943b). Moreover, the incidence-rates of the affections provide indexes of the *psychological health* of a community (as contrasted with its *physical health*) and provide information relating to such matters as group morale, the degree of communal frustration, and changes in the "personality type" brought about by changes in the social environment (Halliday 1945c).

Any such changes, whether in childhood or adulthood, would moreover require to affect significantly "the masses"—i.e., the labouring and artisan classes—who compose by far the greater proportion of the population and thereby "dominate" the major trends of the vital statistics of a nation.

The question arises therefore: Did the significant changes, theoretically required by inference from ætiological findings, actually take place in "the child world" and/or in "the adult world" of the masses between the end of the 19th century and the outbreak of the war 1939–45? To obtain an appropriate answer, the changes in the environment of infancy and of adulthood must be viewed, not primarily in terms of their physical, chemical, or micro-organic effects, but in terms of their *psycho-physiological* effects.

Changes in the World of the Child

MILIEU OF INFANCY IN '60'S OF 19TH CENTURY

Breast-feeding was universal, or almost so. In cases of difficulty wet-nurses were used. They were readily available, as one infant out of about five died before reaching its first birthday. (The feeding-bottle, known in England since the previous century, was used only by the wealthier classes. Teats were either real calves' teats preserved in spirit or were made of wash-leather or parchment, the artificial nipple being attached by thread to the neck of the bottle. Nothing was known about sterilisation, and the mortality among bottle-fed infants must have been considerable. Not until the supply of rubber became more plentiful towards the end of the 19th century did the feeding-bottle become popular among the working classes.) No special attention was paid to the times of breast-feeding, and the occasions of suckling were determined by the desires of the child or the mother. This was facilitated by the prolonged body contact between them, the baby being carried about by the mother in the folds of a shawl or plaid. A wooden-wheeled baby-carriage was the prerogative of the wealthy but was too expensive for the working classes. Its usage was condemned by the doctors of the period on the ground that it denied to the infant the comfort of strong loving arms—"a baby in arms," they said, "should be a baby in arms." (The modern type of perambulator did not appear until the '80's.) At night the infant might sleep in a wooden rocking cradle, but often it lay alongside its parents or siblings—a practice that, especially if the parents were drunk, which was not rare in those days, often led to its death from "overlaying." (Death from overlaying was not taken too seriously, and the law of the period regarded it merely as an offence and not as a crime.) As for clothing, the infant was "swaddled"—i.e., wrapped in bindings—even sewn up for months at a stretch. Washing of the infant was thought to be dangerous.

Little was attempted in *bowel-training* until the second or third year. Infantile incontinence was of small moment to the generations who, before the introduction of water sanitation, possessed an easy-going tolerance of fæcal smells. Why worry? The child, given time, would naturally develop control of the sphincters and discover for itself the advantages and delights of its own unaided accomplishment. Floors were either of stone or bare boarding, carpets being scarce and linoleum unknown. Furnishings were few but substantial, a deal table and a few wooden stools or chairs, apart from a straw bed, often comprising the total plenishings. The toddler had therefore a good deal of freedom not only to defæcate at its pleasure and leisure but also to explore and manipulate objects.

The *size of the family* was large, children were plentiful, and juvenile nurses and playmates abounded. Toys were simple and few, and toddlers found natural pleasure in amusing themselves; hence early social impulses found a ready fulfilment. Adults made little fuss of children, who were neither expected nor encouraged to express themselves as "young persons." Children, it was said, should be seen but not heard.

There was no compulsory *education*, and schooling cost money. In certain industrial districts half of the children of our "modern school age" were unable to read. Instead of being sent to school, many children were sent to work. (The employment of children under 9 years of age had been prohibited by an Act of 1833, which, however, was not enforced.) Even in the '60's children aged 9–13 could still be employed legally for 48 hours a week.

The *structure of the family* was patriarchal. Father dominated both mother and children, to whom he issued his fiats and upon whom he freely expressed his moods. The God of the period was modelled upon Father—someone terrible, unpredictable, and all-powerful. Priests, parsons, and preachers threatened young children with the fires of Hell. Not till the end of the century, when the patriarchal set-up was beginning to loosen, did a less sadistic deity emerge, the angry Fire God in heaven becoming replaced by the gentler "Friend for little children above the bright blue sky."

Comment.—Viewed physiologically, the child's environment was appallingly bad. Dirt, absence of pure water-supply and adequate sanitation, overcrowding, bad housing, poverty, malnutrition, and long working hours all contributed to tragically high rates of bodily impairment and death. Viewed psychologically, however, the child's environment was not so bad, in that during the early years emotional growth was largely permitted to develop and unfold in its own way and at its "own good time." The vital drives of the oral and aggressive phases therefore obtained a fair degree of outward expression, and it may be surmised that those physiological dysfunctions and tensional states associated with emotionally induced "imbalance" of the vegetative nervous system were neither acutely provoked nor unduly prevalent. Not until the third (or genital) phase of infancy does there seem to have been any great frustration of emotional growth, and this took the form of ignoring the child—of seeing him and not hearing him—a custom which, together with the problem of Father, may have a bearing on the apparently high incidence of hysteria in the Victorian era.

MILIEU OF INFANCY IN '30'S OF 20TH CENTURY

When we contrast the milieu of infancy of the recent '30's with that of the '60's, we find it had undergone a change of the profoundest kind during the intervening 70 years. Infants were no longer reared "instinctively" or by natural impulse as modified from district to district in accordance with the traditions of their respective wise old women of the tribe. Instead we find a consciously directed communal effort to rear babies in accordance with the principles of the most up-to-date scientific physical hygiene. The procedure was not confined to the better-off social classes but, as a result of official propaganda and the establishing of child-welfare clinics, was widespread among the masses also. The change represented an entirely new departure in the conditioning of infants. Nothing resembling it is to be found in the previous history of man. It had far-reaching social consequences not only in the cutting down of the previous appallingly high rates of infant mortality and in improving the expectation of life—these effects had been anticipated—but also in modifying the foundations of "personality structure" of the newer generation—an outcome that had not been foreseen.

Breast-feeding was practised only partially. At least half of the infants were on the bottle by the time they were three months old, the proportion receiving artificial feeding being considerably higher in the urban than in the rural and remote areas (Department of Health for Scotland 1943). The occasions of feeding in the bottle-fed (and in many of the breast-fed also) were determined not by biological rhythms but by the clock and the time-table. The child's impulse to play at the breast was no longer fulfilled, and dummy teats, so popular earlier in the century "to keep the child quiet," had by now been discarded as unhygienic. Body contact between mother and child was at a minimum. A large proportion of births, especially in urban areas, took place in institutions or hospitals, where the newborn baby was kept segregated in "the infant ward." Shawls and plaids had disappeared as articles of feminine attire, and "the infant in arms" had become "the kid in the pram." The infant slept in a separate cot. Even spiritual contact between mother and child had been reduced. Thus, if the child cried when laid down after its feed, the mother was medically enjoined to leave it alone. This somewhat stern impersonal régime was, however, usually relieved by the daily bath and exercises, which the infant appreciated with joy, very evident to the onlooker.

Bowel-training was not infrequently instituted from the second or third day of extra-uterine life, and when the clock struck certain hours little pots were punctually applied to little botts. Water sanitation was general, and the population had become conscious both of dirt and of fæcal odours. With the introduction of a relatively abundant supply of household furnishings, carpets, bedding, &c., the masses had also become possession-conscious. Women vied with one another in having "a nice house." This ideal conflicted with a free expression of the infantile phase of exploration and destruction. The social instincts of the toddler were also increasingly denied outlet. Many of the new houses were set apart from one another; families were becoming smaller; and playmates were neither so numerous nor available. The child therefore was drawn more and more against the parents, who began to feel they were never let alone, and their continuous reactive prohibitions and admonitions rendered the child inwardly insecure and outwardly "difficult," so long as it was unable to attain to the orderliness, tidiness, punctuality, dutifulness, &c., demanded by the parents as a standard of behaviour.

As young lives were scarcer, children became more noticeable and more precious. Consequently greater attention was paid to them, especially by the parents of *small families* who because of inner feelings of guilt felt they owed everything to the child, whereas, as Gillespie (1942) has pointed out, in the Victorian age children had been instructed that they owed everything to the parents besides God who had created them.

The advent of *automobile traffic* created a new problem for the child. While still learning to walk he had to attempt to obtain a standard of attentive observation and motor coördination—of "traffic sense"—beyond the potentialities of functioning possible at a stage of cortical development which did not permit of the finer degrees of voluntary control.

At the age of four or five every child was despatched daily from the home (usually to the great relief of the mother) to the communal nursery or day school, where within a few years it was competing with its coevals for "stars" or marks at tests or examinations—miniature ordeals which, if the parents had too much identified themselves with their offspring, occasioned in the child much shrinking, anxiety, and even panic.

The *structure of the family* was no longer patriarchal. Not that it had reverted to the matriarchal arrangement of prehistory. Instead, something entirely novel had developed—the attempt to base the family on the parental dyad appearing in the rôle of pals, equals, and comrades. This neutralisation of sex distinction in the parents was reflected in the retiral of Jove-Jehovah with his bolts from heaven and of his counter-image with his furnaces in hell. Even "The Friend for little children" so evident at the turn of the century was becoming dim and ineffective as children began to visualise the bright blue sky as a background for aeroplanes and to learn at school that life could not be maintained beyond the stratosphere.

Comment.—Viewed physiologically, the response to the scientifically improved hygienic environment may be evaluated as good, in that child life showed a much higher rate of survival and of physical integrity, thus laying the foundations for an adulthood distinguished by an improved "physical health." But, viewed psychologically, the infantile milieu was not so good. The oral and allied drives of the first phase of infancy were not adequately lived through or worked out, with the result that the child retained within his being an undue sense of insecurity—in psycho-analytic terms, chronic unexpressed dependency. The drives of the second (or exploratory-aggressive) phase were likewise unduly curtailed from adequate outlet, the child retaining within its being chronic unexpressed resentment and hostility. Some of this unliberated energy became diverted to the formation of obsessional trends; hence, a time-table or robot-like method of living became increasingly prevalent. Weiss and English (1943) summarise certain features of this situation in relation to the American child of 1942 as follows:

> "There has been too little friendliness shown to the child and too much emphasis placed on his gaining control of himself. He is subjected to harsh discipline beginning with the period of bowel training. He is made to feel shame and humiliation if he does not quickly master bowel and bladder control. He is criticised if he does not achieve neatness, cleanliness, punctuality, memory for detail—in short, he is forced to live up to adult standards in all things at a very early age."

The relatively high degree of frustration operating during the two primary phases of infancy had definite psychophysiological repercussions. The "life," instead of being allowed to unfold naturally with the concomitant maturing of bodily order, was subjected to an imposed system of conditioning which prematurely provoked, or predisposed to, bodily disorders by inducing tensional states or dysfunctions in the gastro-intestinal tract, the respiratory system, the cardiovascular system, the voluntary muscular system, &c. The third phase of infancy, however, was probably less frustrated than in the previous century in so far as more notice and attention were given to children; the phallic Father was no longer in fashion, having been replaced at first by Daddy (who was kind) and later by Pop (who was ineffective, even contemptible); and there was less positive indoctrination of the sense of sin and guilt before an all-seeing and almighty God.

DISCUSSION

The foregoing survey of the evidence shows very clearly that the changes in the milieu of infancy, postulated by epidemiological theory as one of the two possible reasons for the rising incidence of psychosomatic organic disease, did in fact take place between 1870 and 1930. These changes, moreover, were of a kind that increasingly frustrated emotional development both intensively and extensively, especially during the first two phases of infantile life. This would have the effect of progressively increasing the proportion of the population with a disposition to physiological dysfunctions and thereby would be associated with increased *somatic* "physiological" susceptibility to emotionally disturbing events in adult life. The evidence suggests, however, that the third (or genital) phase of infancy was becoming progressively less frustrated. This would have the effect of progressively lessening the proportion of the population with a disposition to hysteria and would be associated with a lessened "neurological" susceptibility to emotionally disturbing events in adult life.

The changes in the milieu of infancy tending to increase the predisposition to psychosomatic affections could not, however, reveal their full consequences until the children undergoing these frustrating experiences had attained to adult life. In other words, a lag of at least 20–30 years must elapse between the general introduction of a revolution in infant conditioning and the manifestation of its effects in the incidence-rate of psychosomatic affections. Can we say when the revolution in infant conditioning became general in Britain? Unfortunately we cannot. For, as Trevelyan (1944) reminds us, "social customs never change completely or all at once," and no "positive dates" are available to indicate the time and the scope of the introduction of the various alterations in the rearing of infants which undoubtedly took place. It seems likely that the new customs percolated slowly throughout the community, and that the changes did not get under way on a large scale until some time after the turn of the century. Certainly it was not until the war of 1914–18 that the institution of child-welfare clinics became general. It seems reasonable, therefore, to surmise that the changes in the conditioning of infants did not become widespread until after 1920 at least. On this assumption the incidence-rate of the psychosomatic affections could not be fully influenced by the alterations in the milieu of infancy until after 1950 at least. It may therefore be concluded that in so far as changes in the social conditioning of infants have been a factor in the rising incidence-rate of the psychosomatic affections in adults, the full effects in this respect have still to become manifest.

The problem may, however, also be considered from a somewhat different aspect by collating the possible rising incidence of the affections during the late 19th century and their definitely rising incidence during the 20th century with the behaviour of the birth-rate. In Britain the birth-rate was at its maximum round about 1870. Taking the fertility-rate in that year as 100%, by 1900 it had fallen by 25%, and by 1930 by about 60%. Adopting the suggestion that this decline was related to an increase in communal anxiety (Halliday 1945a), we may assume that the generation born about 1870 would respond to the breaking up of the old social order and the increasing uncertainties of the period by becoming mildly anxious, with the result that, when they married (about 1900), they would have fewer offspring than their parents had. The second generation, born in 1900, grew up through war, strikes, financial crises, and mass unemployment, to which they would respond by a still further anxiety, with the result that, when they married (about 1930), there would be still fewer children to provide the third generation, and those that did arrive would be hyper-anxious.

These ideas are illustrated in the following table, in which the letters P and C refer to parent and child, and the plus sign to the degree of morbid anxiety.

Year	*Degree of anxiety*		*Fertility-rate* (%)
1870	P	C+	100
1900	P+	C++	− 25
1930	P++	C+++	− 59
1960	P+++	C?	?

The basis of this approach is that anxiety is infectious, and that anxious parents infect their children. On this assumption an increase in group predisposition to psychosomatic illness would therefore be attributed to a general spread of "tension" in the domestic atmosphere. This interpretation provides a useful but probably much over-simplified description of the responses of the growing life to the stresses engendered by rapid alterations in the social pattern.

Changes in the incidence-rates of the psychosomatic affections cannot, however, be interpreted in terms of changes in the world of childhood alone. Consideration must also be paid to changes in the world of the adult.

Changes in the World of the Adult

The world of the adult, so complex in relation to that of the child, cannot be described in terms of a short formulation. Its complexity became even more complex in the years following 1870, and many volumes would be needed to describe the particulars of its expanding elaboration. Fortunately it is not necessary for present purposes to catalogue the alterations in detail. All that is required is to indicate how the drives and impulses of the emotional life of the adult became increasingly disturbed, diverted, frustrated, or distorted in response to the progressively accelerating changes of the psychosocial environment. Nor is it necessary to attempt a quantitative assessment of the importance of each change.

Speaking broadly, and using metaphors for the sake of compression, the following are some of the tendencies discernible.

Increasing Separation from Outward Roots in Mother Earth.—The population became increasingly urban. Whereas in 1860 about 50% of the people lived in rural areas, by the following '30's the proportion was only about 20%. What part this progressive urbanisation per se played we cannot assess, but we may surmise that it increasingly tended to cut off more and more persons from the times and tides of nature which instigate and exercise deep-seated emotional responses. It also cut down opportunity for free muscular exertion in the open spaces and air, and subjected an increasing proportion of the community to regulation of their life in terms of clock-time.

Increasing Disregard of Cosmic and Biological Rhythms.—The growing indifference to seasonal and diurnal rhythms and the increasing dissociation of the individual from the deepest levels of his emotional life were not solely a function of increasing urbanisation but also were influenced by the expansion of "the machine," developments in transport, and the introduction of artificial lighting. The invention and spread of such terms as time-table, day shift and night shift, and piece-work illustrate this tendency. The working rhythms peculiar to each individual were increasingly disregarded and socially disapproved.

Increasing Frustration of Manipulative Creativity.—A feature of the period was the changes in the means and the methods of industry. In 1860 most of the power in industry was produced by human muscles, but by 1930 it was obtained by power-driven machinery. The older "hand-made" article was being replaced by the mass-produced one, and the scope of creative manipulation as a means of emotional expression was becoming more and more limited. Even such satisfaction as was provided by the handling of the machine was denied to many by the epidemics of mass unemployment that were especially severe in the interval between the two world wars. And even more subtly but just as effectively did rationalised restrictions on output (themselves a "neurotic" symptom) operate to frustrate further the worker who still remained in employment. An example of this phenomenon of "man against himself" was the national need for houses for workers, on the one hand, and the formation of "rings" by the manufacturers and the imposition of restrictions on bricklaying by the labour unions, on the other.

Increasing Rapidity of Change in Structure of Society.—This might be described as the "insecurity of the collapsing platform," in that persons knew neither where they stood nor how long they would stand. More technically and concisely it could be described as "disintegration of society." In 1860 the stratification of social classes was still fairly well defined and generally accepted. People "knew their place" and understood their standing, and they confidently worked, played, and strutted upon their apparently irrevocably allotted stage. In the years that followed, class warfare emerged. The old order was changing and indeed breaking, but a new order of reintegration had not yet emerged. The symptom of mass unemployment not only denied to the individual the emotional release of manipulative activity but also isolated him from society. Scales of relief admittedly provided him with the partial satisfaction of his basic infantile needs of food, clothing, and shelter; but these satisfactions alone were insufficient for an adult.

The need to be "safe"—whether against the outer threats of occupational loss (or lack of promotion), financial embarrassment, or social disapproval, or against the inner threats arising from frustration of "the life"—came to evoke a style of living regulated by obsessional mechanisms as a defence against ever-growing danger. It was no coincidence, but a manifestation of the trend of things, that Mr. Baldwin in the early '30's offered "safety first" as Britain's new motto, nor that in 1939 the repressed emotional life of the community found relief and even satisfaction on the outbreak of war.

Increase in Standardisation and Repression of Individual Expression.—Standardisation was furthered by the growing mass-production of information, entertainment, clothing, and (more especially) "education." The increasing standardisation of "education" in schools and universities was associated with the octopus growth of the examination system which, concerned mainly with the acquisition of information from books, did not recognise the equally great (and indeed greater) need for educating the emotions—i.e., of life-learning and the development of personality and character. (Teaching implies a human relationship—i.e., a relationship based primarily on the emotions and only secondarily on the intellect—and, as we look back on our own life, we come to realise how the few persons who imparted to us either knowledge or wisdom—even in a strictly technical subject—did so not in virtue of their standardised qualifications and diplomas but of their personalities. The imparting and assimilating of factual information are very necessary but in themselves are inadequate as a substitute for education in living.)

Increasing Absence of Aim and Direction.—Life cannot be comprehended solely in terms of forces operating from behind. It is not only a matter of impulsions a tergo but also of propulsions towards an object, goal, or end in view. Every physician has noticed how the interposition of a fresh aim in life or of a new vision operates favourably by "giving the patient something to live for" and is an important factor in recovery. An important aim in the lives of many vanished with the decline of active religious faith, and its recession took away a meaning and significance from life. One of the natural ends of marriage, at least for women, is to have babies, but with the changes in the course of things this goal conflicted with the security of the husband or the freedom, narcissism, or respectability of the wife. The aim of work is to create; but, whereas the old craftsman saw in visible form the growth of the product of his manipulative activity, the new worker handled only parts and was denied the satisfaction of seeing his endeavours carried through to their completed end. In short, there was a progressive restriction of emotional vision—not only of sight but also of insight. Only perhaps in war-time, and that under inspiring leadership, did the masses regain some sense of purpose, of direction, and of movement towards a clearly envisaged goal.

Comment.—The various tendencies described above might be summarised by saying that between the '70's of the 19th century and the '30's of the 20th century there was a progressive increase of "inner insecurity," which (apart from the influences of altered social conditioning of infants) was a response to the progressive increase in the outer "economic" insecurity in respect of occupation, income, and status of the individual in the social setting; the emotional tensions thus engendered could not be adequately liberated because of the progressive restriction on the creative activities of making and producing "goods" and because of the increasing neglect of innate biological working rhythms; neither could the tensions be canalised in the form of a drive to a good object or goal either in this life or a future one. There was also a progressive recession of the sphere of "the divine," associated with the increase during the period of secularisation of thought—i.e., rationalism. This withdrawal of "God", is far from unimportant in its practical psychological and social effects.

DISCUSSION

This short inventory indicates that the changes in the milieu of adulthood, postulated by epidemiological theory as the second possible reason for the rising incidence of the psychosomatic affections, did take place between 1870 and 1930. Emotionally frustrating influences increased in intensity throughout the period and had the effect of tending to provoke widespread and deep-seated feelings of anxiety, insecurity, helplessness resentment, and isolation. Of those who were deeply insecure some fell into a chronic condition of dependency and helplessness, looking to the State to become their mother; but others defended themselves against these inner feelings by excessive self-help and compulsive over-independence ("I'm never at rest unless I'm restless," as a patient once said to me. He had a gastric ulcer). Of those who were exasperated, resentful, and hostile, some fell into a chronic condition of whining querulousness, over-irritability, hypochondriasis, or agitatorism; others diverted their unexpressed hostility to the strengthening of obsessional tendencies; and still others diverted this energy into a compulsive drive to relentlessly unremitting work directed towards attaining (or maintaining) positions of power and authority. The general ebbing tide of natural emotional expression was attended by the appearance of what one of my friends has called (but not quite appropriately) "the most moral generation that ever was." He recalled how observers who had remembered the "loose licentious soldiery" of the Boer War (1889–1902) saw the beginnings of this increasing restraint in the men of the war 1914–18 and were amazed at the relative orderliness, sobriety, subduedness, and chastity of their sons in the war of 1939–45. This growth of "respectability" may be collated with the psychiatric findings that, whereas in 1914–18 hysteria was common among "other ranks" and anxiety states among officers, in 1939–45 hysteria was less often observed, anxiety states were even more prevalent, and reactive depressions showed a relatively greatly increased incidence. (See *British Medical Journal* 1945.)

The growing sense of social insecurity that provoked the need for reassurance was probably responsible for the extraordinary increase in smoking during the period. In 1850 the average consumption of tobacco per head each year in Britain was $^{1}/_{4}$ lb., but by 1940 it had risen to 4 lb. per head. This does not necessarily imply that insecurity was exactly 16 times as great. Another symptom of growing insecurity was the rapidly expanding popularity and consumption of patent medicines, and still another was the spread of magazines devoted to such subjects as vigour, personal health, and personal psychology.

Further Epidemiological Interpretations

The adoption of the psychophysiological viewpoint throws light not only on the rising trend of the psychosomatic affections but also on their other statistical features. Illustrations of its usefulness in interpreting other features of their incidence in Britain 1900–39 is given below.

Incidence Greater in Urban than in Rural Areas.—The rural milieu was not so instigatory of predisposition during infancy. Thus the proportion of artificially fed babies was, as already noted, much lower than in the cities, and the young growing life was more directly exposed to the emotional influences of Mother Nature. In adulthood the rural milieu allowed more individual self-expression (there are more "characters" in the country); the decline of religious faith was relatively less; intellectualism received little stimulation; and work was more in accordance with diurnal and seasonal rhythms. In short, the older mores prevailed to a greater extent than in the cities. The lower incidence of psychosomatic organic diseases in remote and rural areas may thus be collated with the alleged relative rarity of these diseases in "primitive races"—i.e., communities not influenced by "industrialised western civilisation." Admittedly no adequate statistical data exist for "primitive races," but the impression of many observers that the psychosomatic affections among them are either unknown or rare is in conformity with both ætiological and epidemiological expectation.

Well-marked Differences in Incidence between Various Social Classes and between Various Occupational Groups.—An interpretation of these differences would require to take account of the considerations illustrated in this paper.

Shift in Age-incidence.—With the rise in incidence, the maximal incidence tended to move towards the younger age-groups. This phenomenon is probably related, at least in part, to the increased piling-up of predisposed individuals, an effect resulting from the progressive changes in the social conditioning of infancy.

Shift in Sex-incidence.—The rate of rise (except in diabetes) was greater in males than in females. The changes in the milieu of infancy were the same for both sexes, but psycho-analytic theory suggests the possibility that the male infant, being in a closer and different emotional relationship to the mother, experienced the progressive increase in oral frustration more severely (or at least differently) from the female. But, irrespective of whether we reject or accept this suggestion, the changes in the milieu of adulthood did very clearly affect the two sexes differently. The alterations in the world of women saw the emergency of the "new woman" whose "emancipation," although providing her with access to many new interests and satisfactions, was not attended by the simultaneous withdrawal of the social sanctions which allowed her to retain her moods and modes of feminine behaviour, in virtue of which she continued to be able to liberate her emotional tensions in forms and expressions denied to the male. The influence of social changes on the psychological characteristics and bodily diseases of the female sex is a subject that has not yet been adequately studied.

Peculiarities of Particular Incidence-rates.—An epidemiological interpretation of the incidence-rate of each syndrome or disease would require to relate the "ætiology" of each affection to particular frustrations operating in infancy and particular social stresses operating in adulthood during different periods of historical time and in different social groups.

EPIDEMIOLOGICAL CONCLUSION

The changes which took place between 1870 and 1930 in the child world and in the adult world were demonstrably of a kind that are in accordance with the expectations of ætiological investigation in terms of psychosomatic medicine. This reconciliation of the ætiological conclusions with the facts of the prevalence satisfies "the ætiological principle of the prevalence" (Halliday 1943a). It may therefore be concluded that our notion of the causation of the psychosomatic affections has a correspondence with reality.

CLINICAL NOTE

Clinical experience suggests that, when early acquired predisposition is clearly marked, somatic illness may be precipitated in adult life by an external event so trivial in the objective sense that it may be regarded as the equivalent of the straw that broke the camel's back. In such instances the sickness appears in the nature of a "personality disorder" or, as it used to be called, a "disease of the constitution." If, however, early acquired predisposition is not so marked, somatic breakdown may not occur unless or until the life situation becomes very acutely upsetting, repeatedly disturbing, or chronically oppressive. In such instances the illness appears more in the nature of a reactive process—i.e., as a mode of response of "the life" to a readily recognisable environmental factor or set of circumstances.

General Discussion

Epidemiology, which takes account of the times and places of incidence, was founded and formulated mainly upon experience gained by the study of infectious diseases, but its use as a framework of interpretation is equally applicable to many modes of morbid behaviour that are manifestations of disturbances of emotional development—i.e., of "life" viewed psychologically, psychosomatically, and psychosocially. These modes of behaviour are by no means confined to the psychosomatic affections. Another example is the falling birth-rate, whose decline has interesting epidemiological correspondences with the rising incidence of the psychosomatic organic diseases (Halliday 1945a). Others of particular medical interest are poor working capacity, morale, delinquency, and crime. And others, often (but erroneously) supposed to be of no medical interest whatsoever, include the happenings and trends in art, literature, industry, economics, administration, religion, and international relationships. This extended usefulness of the allied disciplines of ætiology and epidemiology can, however, only be indicated and then immediately dismissed in a communication whose primary concern is the problem of the psychosomatic affections.

GUIDANCE FOR ACTION

The scope of the paper being limited to epidemiological considerations, only a superficial glance can be given to the guidance for action that it suggests; but it may be noted how the problem of preventing a high incidence of these diseases must depend on our ability to change either the "causal characteristics" of the persons comprising the group or the "causal factors" of the social environment, or both. The personality characteristics ætiologically relevant to the psychosomatic organic affections cannot, unfortunately, be altered by any simple form of mass prophylactic injection as in the infectious diseases. Also, because of the weight of numbers involved, it is clearly not feasible, even if it were possible, to alter the emotional "susceptibility" of the group by psychotherapy of individuals. An approach to the problem in terms of "life changing" (to use an expression of the evangelising Oxford Group), though theoretically sound, has therefore only a limited practical application for the purposes of prevention. We are therefore left with the alternative of changing those psychosocial aspects of communal life which investigation demonstrates to be "causal." Thanks mainly to psycho-analytic research, a considerable amount of knowledge now exists in respect of noxious influences operating during the earliest years. We know now that child welfare is a matter not only of applied hygiene and nutrition but also of applied psychophysiology. We know too that education is a problem not merely of instruction but also of securing personality development. Much is also known about the harmful effects of factors in adult life, such as mass unemployment, lack of housing, financial instability, and uncertainty of status in society, besides the absence of facilities for social contacts, recreation, and cultural activities. Recognition is also being accorded to the therapeutic implications of teleological ætiology—i.e., that the acquisition by a population of a vision, an end in view, can counterbalance many of the effects of frustrating psychosocial circumstances that are not immediately remediable.

These are some broad principles (by no means an exhaustive account) that can be regarded as well founded. But, generally speaking, much further investigation is still needed to obtain truly scientific guidance for appropriate and deliberate widespread interference with social customs, institutions, and natural evolutionary trends. A practical solution of the many problems of "the structure of society" may require not decades but generations.

A third and somewhat curious prescription has been suggested for "our present discontents." Unfortunately it is not based upon scientific ætiology but is a manifestation of psychopathology. Its plan is to scrap the whole modern industrial set-up and return to a pre-industrialised form of society. This was seriously put forward as a line of action some years ago by Gandhi in India and also found favour in the Irish Free State. Life, however, is set on a one-directional time-track. Neither in the individual nor in the group can it turn back, and in times of difficulty the impulse to "regress" may be attended by phantasy notions leading into even greater difficulty those who attempt to bring them into practice. For the road of life winds uphill all the way and it does so, as the poetess added, "to the very end."

IMPORTANCE OF PSYCHOSOMATIC MEDICINE TO PREVENTIVE AND SOCIAL MEDICINE

The growth of the industrial revolution in the 18th and 19th centuries was associated with medical consequences which no one had foreseen and whose tragic nature was only slowly appreciated. The concomitant and increasing overcrowding associated with the influx of the population into towns, the dirt, squalor, lack of sanitation, long working hours, &c., were attended by a great increase in mortality (especially from infectious iseases), a low expectation of life, and much physical npairment. The problem was first tackled empirically y sanitarians, many of whom were laymen; but radually, with the appearance and development of the ew technique of bacteriology, insight was provided into hy certain diseases happened or broke out as and when hey did. The discovery and application of appropriate techniques, the introduction of vital statistics, nd the development of sounder ætiological and epidemiological concepts all served to provide an ever-improving uidance for action in terms of demonstrable "causes"; ence preventive medicine gradually became a distinct ranch of knowledge in its own right.

In the 20th century, advances in biochemistry and its pplication to animals and human beings added a new rovince (nutrition) to preventive medicine. Before the utbreak of the war 1914–18 it had been established hat many deficiency diseases could be prevented, and efore the outbreak of the war 1939–45 it was known ot only that the provision of milk and meals at schools dded to the height, weight, and vigour of schoolhildren, but also that proper feeding of pregnant mothers, both animal and human, apparently reduced the incidence of miscarriages, premature births, and even deaths in early infancy. This new knowledge was demonstrated in practice on a national scale by the experiment imposed upon Britain by the rigidly controlled rationing of food introduced during the war.

Before 1940 there was also a spreading but somewhat vague realisation that "social" factors of the environment were somehow important as causes of inefficiency, unhappiness, and illness, and for the first time the term "social medicine" began to become current. At first this was mainly used as a synonym for preventive medicine in its applications of hygiene, nutrition, and industrial medicine. But, with the growing appreciation of the value of the psychological approach, it is now becoming evident that "social medicine" comprises also that further development of preventive medicine which takes account of the techniques and concepts of psychological, psychosomatic, and psychosocial medicine.

The medical repercussions of the advancing changes in the structure of society resembled the changes attending the industrial revolution in that they were neither foreseen nor was their true nature at first recognised. But their biological consequences were much more serious in that they involved the question of the survival of West European man, whether resident in Europe or in lands across the sea. Some of the problems thus arisen and now confronting modern medicine are indeed urgent. They include (1) the declining birth-rate; (2) the high level of the rates of "incapacity for work" occurring, and even rising, at a time when the "physical health" of the people is steadily improving; (3) the self-destructive tendencies, imposed both from without and within, to limit output and spontaneous creativity; and (4) the still lingering menace of another world war.

Modern medicine in the form of social medicine is now facing its responsibilities in pointing out that such problems exist; that they are of primary importance to the public health; and that their nature cannot be understood nor a truly scientific guidance for action be obtained in the absence of the application of the psychosomatic and allied concepts.

Summary

Changes in the world of the child and of the adult, viewed in respect of their psychophysiological effects, are described in relation to Britain between 1870 and 1930. Corresponding tendencies could be depicted in respect of many other countries of pre-war "western civilisation."

A definite effect of these changes was to increase the proportion of the population showing (1) an undue predisposition to physiological dysfunctions, and (2) obsessional trends in behaviour. A further probable effect was to decrease the proportion of the population showing histrionic personality characteristics.

These consequences are reflected, during the period, in the rising trend of many common psychosomatic affections and in the probable contemporaneous decrease in the incidence of gross hysteria.

The significance of these happenings is discussed, and it is suggested that the phenomena are related to the problems of the working efficiency, psychological health, and even the biological survival of a community.

By adopting the techniques and concepts of psychological, psychosomatic, and psychosocial medicine, preventive medicine is enabled to open up a new province of public health, which may suitably be referred to as that of social medicine.

For valuable criticism and helpful suggestions I am indebted to Dr. A. T. M. Wilson, of the Tavistock Clinic. I also wish to express my obligations to *The Century of Science* by F. Sherwood Taylor, which provided me with ready access to so many fundamental particulars concerning infancy as experienced in Britain in the Victorian era.

REFERENCES

British Medical Journal (1945) i, 913.
Department of Health for Scotland (1943) Infant Mortality in Scotland, Edinburgh.
Gillespie, R. D. (1942) Psychological Effects of War on Citizen and Soldier, London.
Halliday, J. L. (1943a) *Brit. J. med. Psychol.* 19, 367.
— (1943b) *Lancet*, ii, 692.
— (1945a) *Ibid*, i, 601.
— (1945b) *Psychosom. Med.* 7, 135.
— (1945c) *Ibid*, p. 240.
Stark, W. (1944) The History of Economics in its Relation to Social Development, London.
Taylor, F. S. (1941) The Century of Science, London.
Trevelyan, G. M. (1944) A Social History of England, London.
Weiss, E., English, O. S. (1943) Psychosomatic Medicine, Philadelphia.

other features of their incidence in Britain 1900–39 is given below.

Incidence Greater in Urban than in Rural Areas.—The rural milieu was not so instigatory of predisposition during infancy. Thus the proportion of artificially fed babies was, as already noted, much lower than in the cities, and the young growing life was more directly exposed to the emotional influences of Mother Nature. In adulthood the rural milieu allowed more individual self-expression (there are more "characters" in the country); the decline of religious faith was relatively less; intellectualism received little stimulation; and work was more in accordance with diurnal and seasonal rhythms. In short, the older mores prevailed to a greater extent than in the cities. The lower incidence of psychosomatic organic diseases in remote and rural areas may thus be collated with the alleged relative rarity of these diseases in "primitive races"—i.e., communities not influenced by "industrialised western civilisation." Admittedly no adequate statistical data exist for "primitive races," but the impression of many observers that the psychosomatic affections among them are either unknown or rare is in conformity with both ætiological and epidemiological expectation.

Well-marked Differences in Incidence between Various Social Classes and between Various Occupational Groups.—An interpretation of these differences would require to take account of the considerations illustrated in this paper.

Shift in Age-incidence.—With the rise in incidence, the maximal incidence tended to move towards the younger age-groups. This phenomenon is probably related, at least in part, to the increased piling-up of predisposed individuals, an effect resulting from the progressive changes in the social conditioning of infancy.

Shift in Sex-incidence.—The rate of rise (except in diabetes) was greater in males than in females. The changes in the milieu of infancy were the same for both sexes, but psycho-analytic theory suggests the possibility that the male infant, being in a closer and different emotional relationship to the mother, experienced the progressive increase in oral frustration more severely (or at least differently) from the female. But, irrespective of whether we reject or accept this suggestion, the changes in the milieu of adulthood did very clearly affect the two sexes differently. The alterations in the world of women saw the emergency of the "new woman" whose "emancipation," although providing her with access to many new interests and satisfactions, was not attended by the simultaneous withdrawal of the social sanctions which allowed her to retain her moods and modes of feminine behaviour, in virtue of which she continued to be able to liberate her emotional tensions in forms and expressions denied to the male. The influence of social changes on the psychological characteristics and bodily diseases of the female sex is a subject that has not yet been adequately studied.

Peculiarities of Particular Incidence-rates.—An epidemiological interpretation of the incidence-rate of each syndrome or disease would require to relate the "ætiology" of each affection to particular frustrations operating in infancy and particular social stresses operating in adulthood during different periods of historical time and in different social groups.

EPIDEMIOLOGICAL CONCLUSION

The changes which took place between 1870 and 1930 in the child world and in the adult world were demonstrably of a kind that are in accordance with the expectations of ætiological investigation in terms of psychosomatic medicine. This *reconciliation of the ætiological conclusions with the facts of the prevalence* satisfies "the ætiological principle of the prevalence" (Halliday 1943a). It may therefore be concluded that our notion of the causation of the psychosomatic affections has a correspondence with reality.

CLINICAL NOTE

Clinical experience suggests that, when early acquired predisposition is clearly marked, somatic illness may be precipitated in adult life by an external event so trivial in the objective sense that it may be regarded as the equivalent of the straw that broke the camel's back. In such instances the sickness appears in the nature of a "personality disorder" or, as it used to be called, a "disease of the constitution." If, however, early acquired predisposition is not so marked, somatic breakdown may not occur unless or until the life situation becomes very acutely upsetting, repeatedly disturbing, or chronically oppressive. In such instances the illness appears more in the nature of a reactive process—i.e., as a mode of response of "the life" to a readily recognisable environmental factor or set of circumstances.

General Discussion

Epidemiology, which takes account of the times and places of incidence, was founded and formulated mainly upon experience gained by the study of infectious diseases, but its use as a framework of interpretation is equally applicable to many modes of morbid behaviour that are manifestations of disturbances of emotional development—i.e., of "life" viewed psychologically, psychosomatically, and psychosocially. These modes of behaviour are by no means confined to the psychosomatic affections. Another example is the falling birth-rate, whose decline has interesting epidemiological correspondences with the rising incidence of the psychosomatic organic diseases (Halliday 1945a). Others of particular medical interest are poor working capacity, morale, delinquency, and crime. And others, often (but erroneously) supposed to be of no medical interest whatsoever, include the happenings and trends in art, literature, industry, economics, administration, religion, and international relationships. This extended usefulness of the allied disciplines of ætiology and epidemiology can, however, only be indicated and then immediately dismissed in a communication whose primary concern is the problem of the psychosomatic affections.

GUIDANCE FOR ACTION

The scope of the paper being limited to epidemiological considerations, only a superficial glance can be given to the guidance for action that it suggests; but it may be noted how the problem of preventing a high incidence of these diseases must depend on our ability to change either the "causal characteristics" of the persons comprising the group or the "causal factors" of the social environment, or both. The personality characteristics ætiologically relevant to the psychosomatic organic affections cannot, unfortunately, be altered by any simple form of mass prophylactic injection as in the infectious diseases. Also, because of the weight of numbers involved, it is clearly not feasible, even if it were possible, to alter the emotional "susceptibility" of the group by psychotherapy of individuals. An approach to the problem in terms of "life changing" (to use an expression of the evangelising Oxford Group), though theoretically sound, has therefore only a limited practical application for the purposes of prevention. We are therefore left with the alternative of changing those psychosocial aspects of communal life which investigation demonstrates to be "causal." Thanks mainly to psycho-analytic research, a considerable amount of knowledge now exists in respect of noxious influences operating during the earliest years. We know now that child welfare is a matter not only of applied hygiene and nutrition but also of applied psychophysiology. We know too that education is a problem not merely of instruction but also of securing personality development. Much is also known about the harmful effects of factors in adult life, such as mass unemployment, lack of housing,

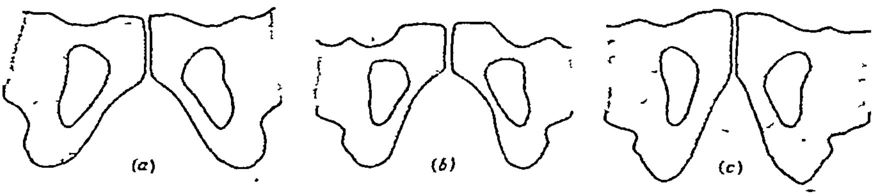


Fig. 3—Tracings of the pubic angle of three pelves: (a) average female angle (85°); (b) contracted female angle (67°); (c) male angle (53°).

me from all social strata of a edominantly rural population, ich has the advantage over e urban population served by larger hospital in that it tends be much more homogeneous th with regard to genetic origin d to general nutrition. This mogeneity is of great value in atistical work and has no effect n the conclusions to be drawn; e are indeed dealing with a fair unselected sample om healthy adult Englishwomen.

The method of radiographic measurement has been ublished by Nicholson (1943) with an estimate of the rror to which it is subject; this error is, if not negligible, t any rate so small as barely to affect statistical estima- ions based on the measurements. The measurements

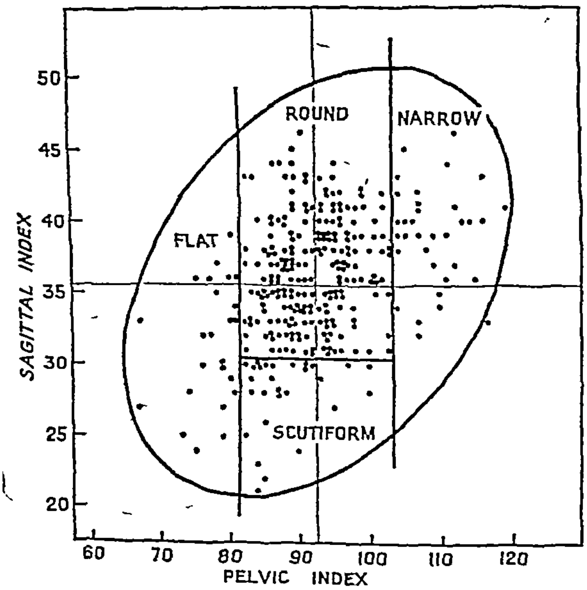


Fig. 2—Scatter diagram of 307 pelves distributed by pelvic and sagittal indices. The ellipse is expected to include 99% of all pelves.

dealt with in the paper quoted are (1) the conjugate (the obstetrical conjugate) and (2) the transverse diameters at the brim; (3) the diameter between the ischial spines and (4) the pubosacrococcygeal diameter at the plane of least pelvic diameter; and (5) the pubic angle. To distinguish between the round and the scutiform pelves a sixth measurement *must be added*—the *posterior* sagittal diameter, which is defined as that part of the conjugate diameter between the promontory of the sacrum and the point where it is crossed by the transverse diameter. As with other anatomical measurements, these six are normally distributed and their distribution is defined by the parameters given in table I. In this table it is worth noting that the mean of the conjugate diameter is $^1/_2$-1 in. greater than that given in textbooks of anatomy and obstetrics; it is also interesting to note that the amount of variation in the transverse diameter is much less than in the conjugate or indeed any of the other measurements.

The amount of association between these six measurements is given by the table of coefficients of correlation (table II). Here the slight positive correlation between the conjugate and transverse diameters is very important. It is a common misconception that the pelvis does not vary greatly in size, and that variation in shape is produced by the lateral or anteroposterior compression of a standard-size pelvis. If that were so, there would be a large degree of negative correlation. The positive correlation is proof that the size of the pelvis is even more variable than its shape. Again, there is a considerable degree of correlation between the transverse diameter and that between the ischial spines, showing that the factor which narrows the brim also narrows the plane of least pelvic diameter. Similarly there is a factor which narrows both the pubic angle and the plane of least pelvic diameter. But these are definitely not the same factor, because there is no correlation between the transverse diameter and the pubic angle.

TWO INDICES

From the given figures we can now deduce the parameters *for two indices or ratios, and we can predict that* these also will be normally distributed. The first is the pelvic index of Sir W. Turner (1886), the percentage ratio of the conjugate to the transverse diameter; this will be low in the flat pelvis and high in the narrow pelvis. The second we may call the sagittal index, the percentage ratio of the posterior sagittal to the conjugate diameter; this will be low in the scutiform pelvis and high in the round pelvis. Fig. 1 shows four pelves from the series to indicate this variation of the two indices. The parameters for these two indices are set out in table III; and, as these parameters are derived from the primary measurements, it would be as well to test whether the distribution of our 307 pelves by the two indices does in fact agree with the normal surface defined by these parameters. This is done in table IV, which shows that agreement is reasonably close.

Now, if the scutiform pelvis is indeed associated with a contracted pubic angle, this should show *itself* as a high positive correlation between the sagittal index and the angle. Six coefficients of correlation are given in table V, which shows that the flatness or narrowness of the brim is carried down to some small extent into the plane of least pelvic diameter, but that there is no other significant correlation between the shape of the brim and the lower levels of the pelvis. Quite *definitely*, then, the android and anthropoid pelves are not associated with contraction of the outlet of the pelvis.

TABLE II—CORRELATION COEFFICIENTS BETWEEN THE SIX MEASUREMENTS (ONLY THOSE IN HEAVY TYPE ARE SIGNIFICANT)

—	(1)	(2)	(3)	(4)	(5)	(6)
(1)	..	+0·1148	+0·7466	+0·2984	+0·0616	−0·0430
(2)	+0·1148	..	−0·0136	+0·1822	+0·4715	+0·0007
(3)	+0·7466	−0·0136	..	+0·1285	+0·0929	−0·0322
(4)	+0·2984	+0·1822	+0·1285	..	+0·1624	−0·0893
(5)	+0·0616	+0·4715	+0·0929	+0·1624	..	+0·4510
(6)	−0·0430	+0·0007	−0·0322	−0·0893	+0·4510	..

THE SHAPE OF THE PELVIS AND LABOUR

We are now in a position to lay down numerical criteria by which the different types of pelvis may be defined. We propose to call "flat" all pelves with a pelvic index of 81 and under, and "narrow" all pelves with a pelvic index of 104 and over, whatever the sagittal index may be. Of the remainder we propose to call "scutiform" all pelves with a sagittal index of 30 and

VARIATION IN THE FEMALE PELVIS

C. Nicholson
M.C., M.A., M.D. Glasg.
SURGEON, MORETON-IN-MARSH DISTRICT HOSPITAL

H. Sandeman Allen
O.B.E., M.A., M.B. Camb., F.R.C.S.
SURGEON, CHELTENHAM GENERAL HOSPITAL

It has always been recognised that the shape of the female pelvis varies a great deal. It is therefore not surprising that radiography of the pelvis in the living subject has led to attempts by obstetricians to associate the shape of the pelvis with obstetrical difficulties.

Of such schemes the classification of the pelvis propounded by Caldwell and Moloy (1938) has been accepted with such unanimity by British obstetricians that it now appears in most textbooks and is taught in medical schools. This classification accepts the older division of the pelvis into the flat pelvis, which they rename "platypelloid," and the narrow pelvis, which they rename "anthropoid," with the medium pelvis between these extremes; this last, however, they further divide into the round pelvis, which they name "gynæcoid," and the shield-shaped or scutiform pelvis, which they name "android." Caldwell and Moloy differ from the earlier anatomists in that, except for the flat pelvis, they have coined names which are not merely descriptive of the shape but also have much wider connotations; and in that they do not give numerical criteria by which the classes may be recognised but simply give "type" outlines of their classes. Classification may be a fine weapon in the armament of science, but classification without precise definition is simply the negation of science and can only lead to the multiplication of types (as Caldwell and Moloy have themselves found; they have now reached over 30 types) until every example has a type of its own.

The value of this classification for obstetricians appears to lie in three propositions:

(1) The android pelvis is, as its name implies, a male pelvis; it is caused by some abnormality in sex differentiation and is associated with other male stigmata in the female.
(2) The android pelvis and to some extent the anthropoid pelvis are associated with a narrowing of the outlet of the pelvis, particularly with contraction of the pubic angle.
(3) The android pelvis is associated with difficulty in labour.

These three propositions we believe to be untrue, and we here give evidence in support of our belief.

SEXUAL DIFFERENTIATION OF THE PELVIS

The female pelvis is a compromise; the male pelvis is architecturally designed for its main function of carrying the weight of the trunk; the female pelvis, besides being lighter in bony structure, has been compelled to sacrifice much of its architectural strength in extra width, so that it may also serve the function of a birth canal. It is possible, then, that the form of the pelvis is determined by two groups of genes—one group identical in male and female, and another group sex-controlled and peculiar to the female.

Now, if genetic abnormality is the explanation of the android pelvis, this pelvic shape would be a true pseudohermaphroditism; but pseudohermaphroditism is very rare in *Homo sapiens*, so rare as to be insufficient to explain the 19% of female pelves which Caldwell and Moloy classify as android. Again, as the pelvis is sexually differentiated subsequently to the differentiation of the gonads, the form of the pelvis may be determined by the gonadal hormones; and, if the android pelvis is to be regarded as due to hormonal causes, it would represent an error in development. Here again, it is well known that all such errors in development of the genital organs, from cryptorchidism through hypospadias up to the false hermaphrodite, occur in the male, and it is very unlikely that an error of development so common as the android pelvis should be the only example in the female. Lastly, the form of the pelvis is determined during fœtal life and cannot be regarded as though it were a secondary sex characteristic due to the development of the gonads at puberty.

On all these counts it is difficult to believe that there is any connexion between irregularity of sexual development and the android pelvis. It is not yet possible to furnish a rigid disproof of this theory of the origin of the scutiform pelvis, but it can at least be said that obstetricians who accept the theory hold views on genetics, embryology, and anatomy which would be regarded as unorthodox by the geneticist, the embryologist, and the anatomist. The scutiform pelvis is almost certainly a normal variation of the female pelvis.

TABLE I—PARAMETERS FOR SIX MEASUREMENTS OF THE PELVIS

—	Mean	Standard deviation	Coefficient of variation
Conjugate diameter (mm.) ..	120·97	9·48	7·83
Transverse diameter (mm.)	131·41	7·69	5·85
Posterior sagittal (mm.) ..	43·33	7·50	17·32
Pubosacrococcygeal (mm.) ..	132·91	10·38	7·81
Ischial spines (mm.) ..	104·89	7·93	7·56
Pubic angle (degrees) ..	86·25	6·90	8·00

MEASUREMENT OF THE PELVIS

The evidence in rebuttal of the other two propositions is drawn from the radiographical measurement of 307 women; pelvimetry was done on all primigravidæ presenting themselves for admission to Moreton-in-Marsh District Hospital, and the 307 measurements with which we are dealing are of those who were eventually delivered in the hospital at full term as vertex presentations during the years 1936–43 inclusive.* They

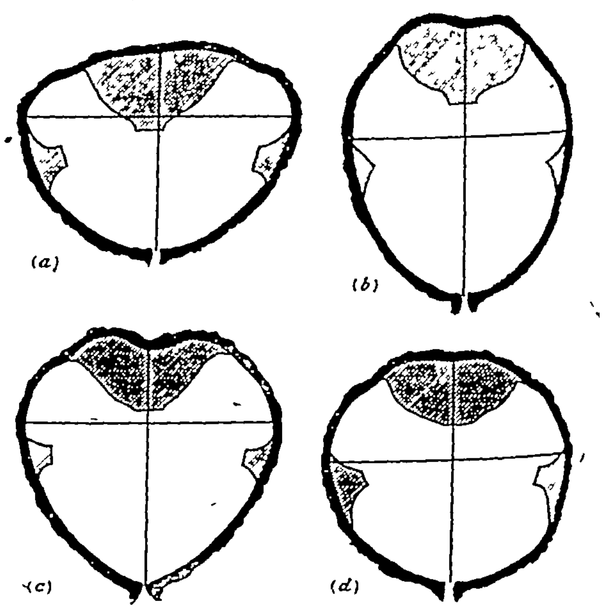


Fig. 1—Four tracings of the brim of pelves from the series of 307:

	Pelvic Index		Sagittal Index
(a) Flat	77	...	36
(b) Narrow	114	...	40
(c) Scutiform	95	...	28
(d) Round	95	...	42

---

* Part of the cost of this inquiry has been met by a grant from the Medical Research Council.

and a widening of the pubic angle; late rickets, on the other hand, and osteomalacia lead to approximation of the heads of the femora and contraction of the angle. Minor degrees of flattening of the pelvis do arise from defective nutrition apart from frank rickets. It has been shown (Nicholson 1945) that the length of the conjugate is even more susceptible to nutritional defects than the stature; it is then not unreasonable to argue that a great deal of narrowing of the angle is similarly produced later in childhood.

It follows that many of the difficulties of labour are directly due to defects in nutrition, and that, with a general improvement in the dietary of children, we can look forward with confidence to a lessening of one of the dangers of childbirth.

SUMMARY

Statistical proof is adduced to show that the android pelvis of Caldwell and Moloy is associated neither with contraction of the pubic angle nor with difficulty in labour.

It is argued that many of the deformities of the pelvis which lead to difficult labour are due to defective nutrition in childhood.

REFERENCES

Caldwell, W. E., Moloy, H. C. (1938) *Proc. R. Soc. Med.* 32, 1.
Nicholson, C. (1939) *J. Obstet. Gynæc.* 45, 950.
— (1943) *Ibid*, 50, 37.
— (1945) *J. Anat.* 79, 131.
Oldfield, C. (1920) Herman's Difficult Labour, London, 6th ed., p. 148.
Turner, W. (1886) Report on the Scientific Results of the Voyage of H.M.S. *Challenger*, London, vol. XVI, p. 47.

MASS IMMUNISATION
OF A FORCE IN THE FIELD AGAINST DIPHTHERIA

J. S. K. Boyd
O.B.E., M.B. Glasg., D.P.H. Camb., K.H.P.
BRIGADIER; DIRECTOR OF PATHOLOGY, THE WAR OFFICE

The Army Pathology Advisory Committee recently had under consideration the immunisation of a large field force against diphtheria. In normal conditions this would be done by carrying out a preliminary Schick test and thereafter immunising those who were Schick-positive, using for preference toxoid-antitoxin floccules (T.A.F.), as this antigen is known to cause less reaction than alum-precipitated toxoid (A.P.T.) or simple formolised toxoid. In the existing circumstances it was not a practical proposition to Schick-test the force, and the only antigen available in sufficient quantity was A.P.T. It was therefore decided to carry out a limited trial to determine if it was possible to eliminate those likely to develop severe reactions by observing the results of an initial dose of 0 01 c.cm. of A.P.T., and excluding from further immunisation any who showed an excessive response thereto. Such a scheme recommended itself because it is known that the majority of those who react to the diphtheria antigens belong to the Schick-negative category: Schick-positives normally show little reaction.

Volunteers were obtained from among the inmates of a convalescent depot. This unit was chosen partly because the facilities for carrying out the test and making careful observations were good and partly because the volunteers, drawn from a vast number of different units, constitute a representative cross-section of the Army as a whole. Schick-testing material and A.P.T. (diluted 1/20 and of normal strength) were supplied by the courtesy of the Wellcome Physiological Laboratories. Inoculations were carried out, and readings made, by me with the assistance of Major C. E. van Rooyen, R.A.M.C., and Captain A. R. T. Lundie, R.A.M.C. Assistance in the initial inoculations was also given by Major W. G. McDougal, R.A.M.C., and Major J. L. Cowan, R.A.M.C., and Colonel J. C. Sproule, C.B.E., helped in reading the results.

TABLE I—COMBINED SCHICK AND A.P.T. SUBCUTANEOUS TEST

Schick result	Reaction to 0·01 c.cm. of A.P.T.			
	(1)	(2)	(3)	(4)
	No obvious reaction	Tenderness without redness or swelling	Visible reaction (redness, swelling, tenderness)	Total
Schick-negative ..	41	22	4	67
Schick-negative plus pseudo-reaction..	1	4	16	21
Schick-positive plus pseudo-reaction..	..	..	4	4
Schick-positive ..	24	12	3	39

The procedure followed was to inject 0·2 c.cm. of A.P.T. diluted 1/20 (equivalent to 0·01 c.cm. of "neat" A.P.T.) subcutaneously over the insertion of the deltoid in the right arm. Simultaneously a Schick test was carried out on the left forearm, and a Schick control on the right forearm. Close observation was maintained for 48 hours, and results were read and recorded after 24, 48, and 120 hours. All who showed a visible reaction to the dilute A.P.T. were excluded from the further stages of the experiment; the remainder were given 0·2 c.cm. of "neat" A.P.T. subcutaneously over the insertion of the left deltoid on the 7th day, results being read 24 and 48 hours later.

PRELIMINARY TEST

The results of the preliminary test, which consisted of a combined Schick test and subcutaneous inoculation of 0·01 c.cm. of A.P.T. (diluted to a volume of 0·2 c.cm.) are given in table I, and show that, out of a total of 131, 88 (67·2%) were Schick-negative and 43 (32·8%) Schick-positive.[*] The more severe reactions (col. 3) amounted to 27 (20·6%), and 20 out of the 27 were associated with pseudo-reactions, the majority (16) in the Schick-negative group. Of the 27 visible reactions, 20 (15·3%) were in the Schick-negative group and 7 (5·3%) in the Schick-positive group. The cases recorded in col. 2 showed no visible evidence of reaction, but the patients complained of tenderness when the arm was handled. The degree varied considerably. In many it was obviously genuine; in some its existence was doubtful. It was felt that the personal factor played a considerable part in these cases, and assessment in some was difficult and uncertain.

TABLE II—REACTION TO 0·2 C.CM. A.P.T.

—	Result of preliminary test	Total cases	Reaction to 0·2 c.cm. A.P.T.					
			A	B	C	D	E	F
Schick-negative	N.R.	38	..	4	8	12	6	8
	T.	21	..	4	8	6	2	1
Schick-negative plus pseudo-reaction	N.R.	1	..	1	..	..	..	..
	T.	3	..	1	2	..	..	..
Schick-positive	N.R.	24	..	..	3	3	8	10
	T.	11	..	3	4	3	..	1

A, general reaction only; B, general (temp. of 100° F or over) and severe local reaction; C, severe local reaction; D, moderate local reaction; E, mild local reaction; F, nil; N.R., no obvious reaction; T., tenderness without redness or swelling.

RESULTS OF INOCULATION WITH 0·2 C.CM. A.P.T.

For the second part of the experiment all those in col. 3 were eliminated. Certain defections occurred in the other groups. The numbers injected with 0·2 c.cm. of A.P.T., together with the results, are shown in table II. The results were assessed according to agreed standards by me, Colonel Sproule, and Major van Rooyen, who together inspected each case and agreed on the category. In those classified as severe local reaction, an area the

---

[*] It is realised that these and other percentages quoted in this paper are subject to considerable sampling variation. This does not, however, affect the conclusions which are reached.

TABLE III—PARAMETERS FOR THE TWO INDICES

—	Mean	Standard deviation	Coefficient of variation
Pelvic index ..	92·32	8·49	9·23
Sagittal index ..	35·68	4·51	12·60

Correlation coefficient +0·4045

under; the rest will be "round." These limits are arbitrary but have not been chosen at random; they have been chosen so that approximately 10% of all pelves will lie in each of the three outlying classes, leaving 70% of round pelves. *Fig. 2 is a scatter diagram* of our 307 pelves distributed in accordance with the two indices and with these dividing lines drawn. From this diagram it can readily be appreciated why Caldwell and Moloy found their android anthropoid mixed type to be very rare, while the android platypelloid mixed type was comparatively common.

All the 307 patients in the series were delivered in the hospital at full term as vertex presentations; hence again we have a homogeneous population for statistical examination. The labours were classed as "assisted" or "unassisted." Assisted labour is defined as any labour in which there was interference of such a degree as to require a general anæsthetic; this definition must include, besides serious difficulties, all those simple cases where forceps were used to lift or merely to control the head over the perineum. In 188 cases (61%) the women delivered themselves unaided; the remaining 119 (39%) are classed as assisted labour.

TABLE IV—DISTRIBUTION OF 307 PELVES BY PELVIC AND SAGITTAL INDICES FITTED TO THE NORMAL BIVARIATE SURFACE

(Figures in parentheses are expected numbers)

—		Pelvic index				Total
		86·5	92·5	97·5		
Sagittal index	38·5	8 (8 3)	21 (16·6)	29 (19 8)	34 (36·9)	92 (81·6)
	35·5	16 (14·8)	22 (20·5)	16 (18·8)	18 (22·6)	72 (76·7)
	32·5	18 (20·8)	25 (22·0)	16 (16·6)	10 (15·4)	69 (74·8)
		34 (31·8)	21 (21·3)	12 (12·5)	7 (8·3)	74 (73·9)
Total ..		76 (75·7)	89 (80·4)	73 (67·7)	69 (83·2)	307 (307·0)

$\chi^2 = 10{\cdot}08$, n = 12, P = 0·61

The test, then, for the association of difficulty in labour with one of the pelvic types is a fourfold χ^2 test. These tests for each of the types are given in table VI. In each case *the answer is unequivocal; there is not the least suggestion* that any of the types has any influence on the course of labour whatsoever. As a contrast, the same test is carried out for two variables which definitely influence the course of labour—the pubic angle and the weight of the fœtus (tables VII and VIII). Here the answer is equally unequivocal; both of these variables have a profound effect on the course of labour.

TABLE V—CORRELATION COEFFICIENTS BETWEEN THE TWO INDICES AND THREE MEASUREMENTS AT THE OUTLET (ONLY THOSE IN HEAVY TYPE ARE SIGNIFICANT)

—	Pubosacro-coccygeal	Ischial spines	Pubic angle
Pelvic index ..	**+0·1378**	**−0·2686**	−0·0301
Sagittal index ..	−0·0089	+0·1053	−0·0175

DISCUSSION

It seems not a little absurd to expect that radiography could teach us anything really new either about the pelvis or about labour; the function of radiography in obstetrics is surely to give precision, to give a numerical value, to the impressions and estimations of the clinical obstetrician. Our forefathers were indeed painstaking clinicians who could neither put their responsibilities on the shoulders of the radiologist nor sidestep their difficulties by a cæsarean operation. In 1894 Herman, whose work is still published and read (Oldfield 1920), said: "The common kinds of slight deformity are the *flat pelvis* and the *generally contracted*, or, as I shall call it, the *small round pelvis*." The common factor in these pelves is that the area of the brim is reduced. It is the size and not the shape of the pelvis that matters; and the only information on the brim which the radiologist can supply and the obstetrician use is a value for the available area. It has been shown that this area is, to a close approximation, the area of the ellipse with the length of the transverse and conjugate diameters as its main axes (Nicholson 1939).

TABLE VI—TEST OF EFFECT ON LABOUR OF THE FOUR TYPES OF PELVIS

—	Assisted	Unassisted	Totals	Probability
Flat ..	9	15	24	$\chi^2 = 0{\cdot}0175$
Remainder ..	110	173	283	P = 0·896
Total ..	119	188	307	
Narrow ..	11	23	34	$\chi^2 = 0{\cdot}6611$
Remainder ..	108	165	273	P = 0·360
Total ..	119	188	307	
Scutiform ..	13	15	28	$\chi^2 = 0{\cdot}762$
Remainder ..	106	173	279	P = 0·357
Total ..	119	188	307	
Round ..	86	135	221	$\chi^2 = 0{\cdot}0077$
Remainder ..	33	53	86	P = 0·915
Total ..	119	188	307	

TABLE VII—TEST OF EFFECT ON LABOUR OF THE PUBIC ANGLE

—	Assisted	Unassisted	Totals	Probability
Angle under 78° ..	24	9	33	$\chi^2 = 17{\cdot}5608$
Angle over 78° ..	95	179	274	$P < 0{\cdot}001$
Total.. ..	119	188	307	

TABLE VIII—TEST OF EFFECT ON LABOUR OF THE WEIGHT OF THE FŒTUS

—	Assisted	Unassisted	Totals	Probability
Weight over 136 oz.	26	11	37	$\chi^2 = 17{\cdot}5951$
Weight under 136 oz.	93	177	270	$P < 0{\cdot}001$
Total.. ..	119	188	307	

Contraction at the outlet of the pelvis leading to interference with labour is always associated with narrowing of the pubic angle, and an accurate value for this angle is information which the radiologist can provide. Fig. 3 shows three tracings from radiograms of this angle. It is at once obvious that narrowing of the angle in the female pelvis is not of the same nature as the narrow male angle; on the contrary, it is produced by an excessive arching of the lower rami of the pubic bones. Now, the architectural function of these rami is to maintain the distance between the weight-bearing surfaces of the acetabula, and it seems reasonable to argue that a common cause of narrowing of the angle must be a weakness of the bones due to malnutrition which, on weight-bearing, permits approximation of the acetabula. It is certain that there is a high degree of correlation between the measurement of the angle and the distance between the heads of the femora. The flat pelvis of true rickets leads to a separation of the femora and acute bacterial endocarditis, but this is rare. The cutaneous form is by far the commonest.

SOURCES OF INFECTION

Infection by *Ery. rhusiopathiæ* results from contact —th organic matter, usually mammals, fish, shellfish, nes, flesh, or shells; but vegetable material and deed any form of nitrogenous product can also be a urce of the organism. In the present series of 115 cases fection arose from the following sources:

Source	*Cases*	*Source*	*Cases*
sh	29 (25·2%)	Thorn	3 (2·6%)
oultry ..	24 (20·9%)	Dog-bite ..	1 (0·6%)
eat	22 (19·6%)	Insect-bite ..	1 (0·6%)
ellfish ..	8 (7·0%)	Unknown ..	23 (20·0%)
ood splinter..	4 (3·5%)		

n most cases the lesion was caused through puncture f the skin by bone, scales, or shells of crustacea. A few ere derived from cuts inflicted by knives used for itting meat. An insect-bite and dog-bite accounted for 1 case ich. Puncture of the skin by horns gave rise to 3 cases, all of hich occurred in persons unconnected with catering: a fireman, a law clerk, and an usher. t is to be presumed that infection arose because either (1) the horn in each case was primarily nfected, or (2) the skin abrasion ame into contact with some ontaminated animal material ater. Wood splinters gave rise o 4 cases—in a market porter, a housewife, a miner, and a person of no occupation—and the remarks already made regarding infection hold good for these cases.

The cases in which the source of infection was unknown form 20% of the series; of these 23 cases, 14 were in persons associated with the catering trade (see below). Klauder (1926) stated that infection could invariably be traced to contact with animals, fish, shellfish, dead matter of plant or animal origin, or matter derived from animals. There is little doubt that, certainly in the case of those connected with catering, and probably in the case of the others, the exciting factor was covered by his definition. Support is given to this view by the fact that 85 of the 115 cases were directly attributable to an animal source, and 7 to organic plant matter.

THE LESION

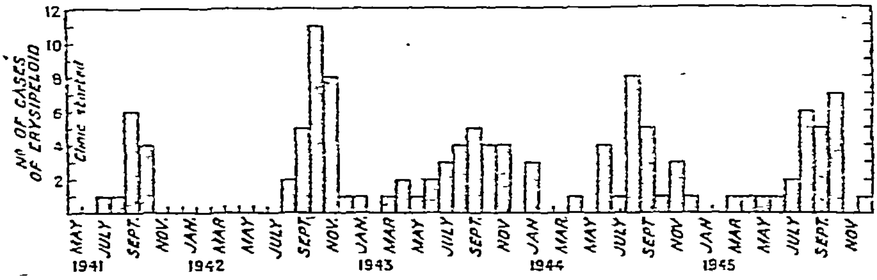
The lesion manifests itself from two to seven days after the initial injury, which may be a cut, scratch, or puncture of the skin. It is characterised by a dark purple-red zone, sharply defined and somewhat raised, in the centre of which the site of the injury is often found healed. It usually occurs on the fingers, and from about the third to the fifth day the lesion extends peripherally, the change being most noticeable towards the upper part of its distribution. After about a week the central part of the rash fades and desquamates, while the periphery continues to extend. It is common for the spread to reach (1) the palm or dorsum of the hand, (2) the neighbouring webs, (3) the adjacent sides of the neighbouring fingers, and (4) the proximal phalanges of the neighbouring fingers. The lesion appears to be commoner on the middle fingers and the thumb, particularly of the right hand.

The rash is accompanied by a sensation of heat, burning, and irritation of the part, which may become considerably swollen, giving rise to a feeling of local tightness. Stiffness of the interphalangeal joints is common, with resulting limitation of movement. Pain is common, especially in the early stages, and becomes worse where the lesion extends, while at the same time easing centrally. It is described variously as throbbing, burning, or smarting. Sometimes there is subcuticular extravasation of blood.

General symptoms are inconstant, though a few patients have sickness and nausea. There is no rise of temperature. Regional lymphangitis and lymphadenitis may develop but are not common. Of the 115 cases only 5 showed lymphangitis, and only 2 localised adenitis, the epitrochlear gland being affected in both cases, and the axillary glands in one. Arthritis of the interphalangeal joints is not unusual and may lead to articular stiffness.

Erysipeloid is characterised by regressions and relapses; for a few days the lesion appears to regress, only to flare up and extend after some days or even weeks. Relapses may occur after apparent cure.

The average duration of erysipeloid under treatment in this series was 17·4 days, but any time from 14 to 28 days is common. The longest case lasted 51 days; several lasted only 7–10 days. In the latter stages the lesion fades from the periphery inwards.



Monthly incidence of cases of erysipeloid

The lesion must be diagnosed from erysipelas. This should not present much difficulty in view of the dusky colour of the erysipeloid, its slow and limited spread, the absence of vesiculation, and the lack of constitutional disturbance. The history of the initial injury and the patient's occupation may also suggest the diagnosis.

DISTRIBUTION

Season.—It is not known for certain whence the organism comes or how it is transmitted. According to Bierbaum and Gottron (1929) the direct transmission of the disease from pigs with swine erysipelas is not common. Verge (1933) stated that actual infection of fish and crustaceans had not been demonstrated. Topley and Wilson (1940) believe that the organism may lead a saprophytic existence in favourable surroundings. Stefansky and Grunfeld (1930) described an epidemic of erysipeloid at Odessa, where about 200 people were infected who had been handling fresh-water fish brought by sailing ships from the Dnieper and the Bug.

The four and a half years under review here have shown a greater seasonal incidence of erysipeloid during the summer and early autumn (see figure). It is no mere coincidence that the incidence of erysipeloid should rise in the summer and autumn, for it is at those seasons that swine erysipelas is prevalent in this country. Since flies are the vectors of many diseases, it is feasible to suppose that they are also the vectors of *B. erysipelatis suis*, carrying the organism from the fæces of infected pigs or from any contaminated organic material; Klauder et al. (1943) cite Kondo and Sugimura (1935) to the effect that the organism has been recovered from house-flies.

Occupation.—Of the 115 cases, 95 occurred among persons connected with catering, including housewives. The incidence is made up as follows:

Occupation	*Cases*	*Occupation*	*Cases*
Cooks	45 (39·1%)	Butchers ..	3 (2·6%)
Housewives ..	13 (11·7%)	Poulterers ..	3 (2·6%)
Fishmongers ..	5 (4·3%)	Others in catering	26 (22·6%)

It will be seen that the highest incidence falls on cooks, size of the palm of the hand or larger was involved, being red, swollen, and tender. Axillary tenderness was present in some of these cases. Many, classified as C and D, had an evening temperature between 99° and 100° F.

DISCUSSION

Taking this group as a representative cross-section of the Army, 67·2% are immune.

The elimination of those who give a visible reaction to 0·01 c.cm. of A.P.T. (table I, col. 3) cuts out 5·3% of Schick-positives and 15·3% of Schick-negatives. By immunising the remainder and assuming 100% success, the percentage of immunes will be raised to 94·7%. This will be done at an expense of approximately 15% of general and severe local reactions, plus 20% of severe local reactions. Of these, about 8·5% will be in Schick-positives, which may be regarded as justifiable, and about 21·5% will be in Schick-negatives, in whom the procedure is entirely unnecessary. To translate these figures into terms of an army of 100,000, and working to approximate round figures, 20,000 will be rejected as the result of the preliminary test. Of the remaining 80,000 who are inoculated with 0·2 c.cm. of A.P.T., 30,000 are liable to have reactions of the type labelled severe. Of these, 8500 will be Schick-positives, and 21,500 Schick-negatives who stand to gain nothing thereby.

TABLE III—SCHICK REACTION IN RELATION TO YEARS OF SERVICE

—	Totals	Years of service							
		1	2	3	4	5	6	7	Over 7
Cases investigated	128	11	16	14	13	11	41	10	12
Schick-positive ..	37	3	7	5	1	3	12	2	4
Schick-positive (%)	28·9	27·3	43·8	35·7	7·7	27·3	29·2	20·0	33·3
Schick-positive (%) in groups ..	..	36·6			24·6			27·3	

If it be decided also to eliminate those in col. 2, this will cut out a further 9·2% of Schick-positives and 19·7% of Schick-negatives. Assuming 100% success in immunisation, the immunity-rate of the community will then be raised to 85·5%. This will be done at the expense of 2·3% of severe reactions in Schick-positives and 10% of severe reactions in Schick-negatives. Expressed in terms of an army of 100,000 the immunity-rate will be raised from 67·2% to 85·5% (assuming 100% success) at the expense of 2300 severe reactions in Schick-positives and 10,000 severe reactions in Schick-negatives.

It must not be overlooked that this test was carried out by experienced workers under ideal conditions for asepsis, careful observation of results, aftercare of cases with severe reactions, &c. Such conditions could rarely be reproduced in the field, and in inoculating large numbers under field conditions a considerable increase in the number of severe reactions, together with occasional cases of septic arm, must be anticipated. Further, there is the by no means remote possibility of cases with late nervous symptoms—deltoid paralysis, &c.—such as are occasional sequelæ of severe reactions from the injection of foreign protein.

In estimating the increase in immunes, it was assumed that the procedure adopted would be 100% successful. This is not at all certain where an adult population is concerned. It is generally accepted that natural immunity to diphtheria, as shown by a negative Schick reaction, is acquired by repeated exposure to subinfective doses of diphtheria bacilli, and for this reason urban communities show a relatively higher immunity-rate than do rural communities. In the Army opportunities for acquiring immunity through natural channels must approximate to those in urban communities, and it is of interest to analyse the Schick reaction in terms of years of service. This is done in table III, but unfortunately the samples are too small to give a steady curve. The general trend, however, suggests that a certain amount of natural immunisation takes place in the first years of service, but that after 3 or 4 years the position becomes stabilised. Whether the injection of toxoid will produce lasting immunity in adults in whom natural methods have failed is a point which calls for further investigation.

It is considered that, in the case of a force living under active-service conditions, mass immunisation with A.P.T., without previous Schick-testing, is likely to cause more harm than good, and the amount of disability inflicted on those who can in no way benefit from it cannot be lightly disregarded.

The approach to the diphtheria problem in the Army seems rather to lie in the immunisation of entrants shortly after enlistment. While in the training centre under conditions which permit of adequate control and aftercare, recruits can be Schick-tested to exclude those who are already immune as well as those who, by the development of a pseudo reaction, show undue susceptibility to the action of the prophylactic. Thereafter Schick-positives can be immunised, and in such circumstances, judging from experience of the procedure in probationer nurses of a more or less similar age-group, reactions are likely to be of minor importance.

SUMMARY AND CONCLUSIONS

1. Schick-testing a field force under active-service conditions, as a preliminary to immunising against diphtheria, is not a practical proposition.
2. An attempt has been made to assess the value of a small dose—0·01 c.cm.—of A.P.T. given subcutaneously as a screening test to exclude those likely to react severely to immunising doses of this prophylactic.
3. This did not achieve its purpose, and left undetected a considerable number of reactors. The majority of these were Schick-negatives, with nothing to gain from immunisation.
4. Mass immunisation with A.P.T. without previous Schick-testing is considered to be unjustifiable.
5. Schick-testing of recruits on enlistment, followed by the immunisation of susceptibles, is considered to be the solution of the Army problem.

ERYSIPELOID

SURVEY OF 115 CASES

PETER F. KING
M.R.C.S.
LATE HOUSE-SURGEON, SEPTIC HAND CLINIC, CHARING CROSS HOSPITAL

THE material for this survey has been obtained from 115 unselected cases of erysipeloid out of 2300 cases of all types seen in the septic hand clinic at Charing Cross Hospital from its inception in May, 1941, until the end of December, 1945.

Erysipeloid is better known to dermatologists than to surgeons. Morrant Baker first described it in 1873, and called it erythema serpens. In 1884 Rosenbach renamed it erysipeloid. The older writers also called it erythema migrans and chronic erysipelas, and it is sometimes known as fish-handler's disease. It is by no means uncommon, since it occurred in 5% of the septic hands at our clinic, and it is almost restricted to people connected with catering, thus being an occupational disease.

The causal organism is the gram-positive bacillus *Erysipelothrix rhusiopathiæ* (Topley and Wilson 1940), which causes erysipelas in pigs. This organism was first described by Rosenbach (1887, 1909). Verge's (1933) opinion is that, besides a cutaneous form, erysipeloid may be intestinal and general. Klauder et al. (1943) published a case in which death was due to septicæmia

DIRECT TEST FOR BLOCKING ANTIBODY IN TREATED HAY-FEVER *

KATE MAUNSELL
M.D. Kiel, L.R C.P.E.
MEDICAL OFFICER, SOUTH LONDON BLOOD SUPPLY DEPOT

IT was shown by Coca and Grove (1925) and Clarke and Gallagher (1926) that an urticarial reaction developed in normal skin when a mixture of serum of a hay-fever subject and the corresponding allergen was injected. The transferred allergic antibodies (reagins) were believed to have sensitised the normal skin quickly, thus enabling those areas to respond to the allergen. However, other workers (Foran and Lichtenstein 1931, Gay and Chant 1927) reported negative results with this method. The clue to these discrepancies was found by Cooke et al. (1935), Stull and Sherman (1939), and Sherman et al. (1940), who noted that the results depended on whether the sera in those mixtures were obtained from untreated or treated hay-fever subjects. When the sera were taken from untreated patients (A sera) the serum-pollen test in normal skin produced urticarial weals. When, on the other hand, the sera were taken from treated hay-fever subjects (P sera), the serum-pollen tests gave no visible reactions. Further, when the sites were retested forty-eight hours later with pollen, the areas which had reacted before (A sites) were found negative, but those which had given no response (P sites) now reacted.

To explain this, it was assumed that neutralisation of the transferred reagins by pollen took place in the A sites but was prevented in the P sites. This inhibition was believed to be due to the development of a new immune-body, which interfered with the neutralisation of the reagin by the antigen. It was termed "blocking substance," and the method, the principle of which has just been described, became known as the "neutralisation test."

By using heated and unheated sensitive sera, Loveless (1940a) proved the theory of two coexisting antibodies to be right. She demonstrated in a large series of experiments that, unlike reagin, the induced antibody showed no loss of its antigen-binding capacity after being heated to 56° C for as long as five hours, or to 60° C for half to one hour. Thus in the serum of treated pollen-sensitive persons the heat-labile reagin and the more heat-resistant blocking substance coexisted. Furthermore, it was shown that, in contradistinction to the reagin, the blocking antibody, as well as pollen, was removed quickly from the site of the injection. Therefore, after some time, the fixed reagin could cause a reaction if pollen was again introduced.

It seemed of interest to study the development of the blocking antibody in specifically and in non-specifically treated hay-fever patients. Cooke's neutralisation test, however, was not used. Instead of injecting mixtures of isoserum and pollen into non-sensitive skin, the skin of the hay-fever subjects was tested with mixtures of their own serum and pollen. A "direct" blocking test with autoserum was thus worked out with the object of detecting and titrating the inhibiting substance.

SELECTED PATIENTS

Twenty-four allergic subjects who were sensitive to pollen only or to pollen and house-dust were divided into two groups according to the treatment they received.

In *group I* (11 cases) specific desensitisation was carried out. The sensitive subjects received the routine course of 30–50 subdermal 'Pollaccine' injections, ranging from 20 to 100,000 Noon units (N.U.) per c.cm.† Injections were given every second or third day, and the doses were increased by 15–30% at each injection. A total dose of 4000–710,000 N.U. was administered.

In *group II* (13 cases) non-specific desensitisation was attempted by the administration of unpooled human isoserum. The subjects received from three to six intravenous injections of 10–30 c.cm. at intervals of a week. The serum was derived from non-allergic group-A donors and given as individual serum to the allergic recipients irrespective of their blood-group. After pulp and Seitz-filtration it had been kept frozen solid for four months. No serum was administered unless it could be ascertained that the donor had not developed any symptoms of hepatitis during that period. This precaution was taken in the hope of reducing the risk of transferring the agent of homologous serum jaundice.

TECHNIQUE

Before any tests were performed on the hay-fever subject a blood sample was taken (sample A). When treatment was completed a second sample was obtained (sample P). After the blood had clotted at 37° C for 30 min. the samples were centrifuged and the serum was taken off under sterile conditions.

Pollaccine solution was made up to the strength of 2000 N.U. per c.cm. with 0·5% carbol-saline. From that solution eleven serial double dilutions with 0·5% carbol-saline were then made, and the twelve pollaccine dilutions were used for preparing two corresponding sets. The first set of twelve tubes contained the twelve serial dilutions mixed in twelve test-tubes with equal volumes of the serum to be tested (serum A or serum P). The second set contained mixtures of the twelve pollaccine dilutions with equal volumes of carbol-saline. The pollaccine in these mixtures in both corresponding sets thus ranged from 1000 to 0·49 N.U. per c.cm. The tubes were allowed to stand at room temperature for $^1/_2$–1 hour before use.

The injections were carried out, on the day of venepuncture, in the skin of the hay-fever subject from whom the blood had been taken. Duplicate injections of 0·05 c.cm. of each tube were given intradermally into the back, starting with the weakest pollaccine solutions. Care was taken not to increase the pollaccine concentration beyond that giving a +++ reaction, to avoid a general reaction. Control injections of carbol-saline and of carbol-saline and serum in equal quantities were also made.

The titrations in the skin were read at the height of the reaction, usually after 15 min. A slight increase of the weal, with a surrounding erythema, was regarded as +, a weal of 1·5 c.cm. diameter as ++, and a weal of more than 2 c.cm. diameter as +++. The strength of the weakest solution of pollaccine, expressed in units per c.cm., which gave a positive reaction was noted as "the threshold value." The ratio of the threshold value of the pollaccine-serum mixture to that of the pollaccine and carbol-saline mixture was termed the "blocking titre."

RESULTS

Table I shows the results on all patients tested in the two groups. Table II is a typical example of the skin-titration carried out on one subject.

Group I.—Before the course of pollen injections, 10 out of 11 pollen-sensitive subjects showed no blocking substance, and only 1 (case 6) had a blocking antibody of a low titre (4). This patient had received six series of pollen injections in previous years. After treatment the inhibiting substance was demonstrated in the serum of all 11 persons. The blocking titre ranged between 8 and 128, and in the patients observed it was highest in those who had received the largest total dose of pollaccine.

Group II.—Initially the 13 patients in this group, like those in the previous group, showed no blocking sub-

---

* A report to the Medical Research Council from the South London and Home Counties Blood Supply Depot.

† A Noon unit is the active substance contained in 0·000001 g. of pollen.

and if one considers each housewife as a cook the percentage becomes 50·8. Barmen, waiters, kitchen hands, &c., account for another 22·6%, and fishmongers, poulterers, and butchers for a further 9·5%. Klauder (1938) reported 100 cases, of which 88 were due to occupational infection, principally among butchers and slaughter-house workers.

In the present series, of the 20 cases not connected with the catering trade 6 were infected from an animal source, 6 from a plant source, and in 8 the source was unknown.

Age and Sex.—All age-groups appear to be susceptible to the disease, and the sexes are equally affected. The youngest patient in the series was an apprentice cook aged 14, and the oldest was a male kitchen hand aged 72.

NON-IMMUNITY

Second attacks do occur. Cutler (1942) states that a *relative* immunity exists in man, but that immunity is not conferred by one attack of the disease. Of the present 115 cases, 2 had second attacks. In the first case an infection of the palm of the right hand was followed four months later by infection of the palmar surface of the left thumb. In the second case a lesion on the right index finger was followed eight months later by a lesion on the right thumb. In both of these cases the source of infection was different for each attack.

TREATMENT

The treatment of the condition is medical; surgery has no place in it. The fundamental principle is rest of the affected part, best obtained by putting the patient off work and using a high sling to keep the hand and forearm relatively immobile. Apart from rest, the cases in this series were treated in various ways, and it is instructive to note that in the 4 cases which had no other treatment the lesions lasted for an average of 12·75 days—a figure lower than with any other form of treatment tried.

The accompanying table shows the various treatments given and the average duration of the lesion. For the sake of comparison the results obtained by Barber et al. (1946) with intramuscular penicillin are added.

Treatment	Cases	Av. duration (days)	Treatment	Cases	Av. duration (days)
None	4	12·75	Sulphathiazole cream	2	17·0
Hot Boric fomentations ..	7	14·0	Kaolin and calamine	7	18·0
Ung. hyd. ammon. dil.	1	14·0	Sulphathiazole cream and glycerin and ichthyol ..	1	24·0
Penicillin cream ..	13	15·0	Sulphathiazole 20 g.	1	33·0
Ung. zinci et picis	1	15·0	*Intramuscular penicillin* (Barber et al. 1946)	3	2·0
Glycerin and ichthyol ..	14	15 4			
Calamine	8	15·9			
Liq. iodi fort. ..	4	16 0			
Saline soak and kaolin	33	16·2			
Brilliant green ..	13	17·0			

It will be noticed that the average duration of the erysipeloid is very much the same whichever treatment (except intramuscular penicillin) was tried. It is striking that results were bad in all the 4 cases treated with sulphathiazole preparations—in fact, the case treated (by his own doctor) with a course of sulphathiazole 20 g. by mouth lasted the longest time. Klauder et al. (1943) and Klauder and Rule (1944) report that erysipeloid does not respond to sulphonamides; but Schoch and Shelmire (1940) report success with sulphanilamide.

Other treatments have been recommended from time to time, such as radiotherapy, 15–20% of an erythema dose being given (Buzello 1935). Serum therapy has its advocates. An immune serum was first prepared in 1898 by Leclainche by inoculating horses with the causal organism. Ritchie (1931) advocated injecting 0·25–0·5 c.cm. round the advancing edge of the lesion. Of Klauder's (1938) 100 cases, 48 were treated with serum in an average dose of 1–2 c.cm. per kg. of body-weight; 18 of these developed serum sickness, and Klauder subsequently gave up using serum, as those developing serum sickness had their period of incapacity prolonged. Cutler (1942) recommends the use of 10–20 c.cm. of serum only in severe or chronic cases, admitting the risk of serum sickness. Because of the risk of serum sickness, serum was not used at this clinic.

Penicillin cream of low concentration was used in 13 cases in the series, and these showed the fair average recovery time of 15 days. Penicillin was not used systemically, being reserved for more deserving cases, but Barber et al. (1946) report an average recovery time of two days in 3 cases treated with systemic penicillin. Except with penicillin, the best and simplest form of treatment for erysipeloid is rest of the part, preferably in a sling, and the application of hot wet boric dressing Now that penicillin is more plentiful, however, it wi probably be used in all but the mildest cases.

SUMMARY

Of 2300 cases attending a septic hand clinic, 115 (5% were of erysipeloid.

Erysipeloid has a seasonable incidence concurrent wit epidemics of swine erysipelas.

Erysipeloid is an occupational disease of the caterin trades.

Immunity is not conferred by one attack.

Treatment is entirely medical. Rest of the affected par is of primary importance. Of the various medicament used, sulphathiazole gave the worst results. Systemi penicillin, which in cases reported by others has led t rapid recovery, was not used.

I am indebted to Mr. R. A. Fitzsimons for permission t publish these cases.

REFERENCES

Baker, W. M. (1873) *St Bart's Hosp. Rep.* 9, 198.
Barber, M., Nellen, M., Zoob, M. (1946) *Lancet*, i, 125.
Bierbaum, K., Gottron, H. (1929) *Derm. Z.* 57, 5.
Buzello, A. (1935) *Int. Congr. industr. Accidents.*
Cutler, C. W. jun. (1942) The Hand: its Disabilities and Diseas London.
Klauder, J. V. (1926) *J. Amer. med. Ass.* 86, 536.
— (1938) *Ibid*, 111, 1345.
— Kramer, D. W., Nicholas, L. (1943) *Ibid*, 122, 938.
— Rule, A. M. (1944) *Arch. Derm. Syph.* 49, 27.
Kondo, S., Sugimura, K. (1935) *J. Jap. Soc. vet. Sci.* 14, 111.
Ritchie, E. B. (1931) *Arch. Derm. Syph.* 23, 1069.
Rosenbach, A. J. F. (1884) Mikro-organismen bei den Wund Infections-Krankheiten des Menschen, Wiesbaden.
— (1887) *Arch. klin. Chir.* 36, 346.
— (1909) *Z. Hyg. InfektKr.* 63, 343.
Schoch, A. G., Shelmire, B. (1940) *Arch. Derm. Syph.* 41, 570.
Stefansky, V. K., Grunfeld, A. A. (1930) *Zbl. Bakt.* 117, 376.
Topley, W. W. C., Wilson, G. S. (1940) Principles of Bacteriolog and Immunity, London.
Vergo, J. (1933) *Rev. gén. Méd. vét.* 42, 65.

"... no large nation has nearly succeeded in evoking an using the full potentialities of intelligence, leadership, energ or skill in the mass of its people. This *hitherto undevelope* reserve forms one of our greatest assets. But we have com to a time when we can no longer afford to allow it to remai idle. The latent qualities must be developed, and onc developed, must be distributed and employed to the bes advantage.... Work which has been done in testing relativel small groups of university and college students provides a indication of the proportion of the population with an intell gence equal to those at the universities and training colleges This evidence shows that about 2% of the population are a least as intelligent as the upper quarter of the university stu dents and graduates tested, and about 5% are as intelligen as the upper half. The proportion of the population wh actually reach the universities at present is rather less tha 2%. The result of testing women non-graduate students a teachers' training colleges in Scotland suggests that abou 10% of the population are as intelligent as the upper quarte of the students, and about 21% are as intelligent as the uppe half."—*Planning* broadsheet no. 253, issued by P.E.P. 16, Queen Anne's Gate, London, S.W.1.

I wish to thank Mr. Terence Cawthorne and Miss Edith Whetnall for selecting the patients for this work and for their interest in the investigations.

REFERENCES

Clarke, J. A. jun., Gallagher, M. G. (1926) *J. Immunol.* 12, 461.
Coca, A. F., Grove, E. F. (1925) *Ibid*, 10, 445.
Cooke, R. A., Barnard, J. H., Hebald, S., Stull, A. (1935) *J. exp. Med.* 62, 733.
Foran, F. L., Lichtenstein, M. R. (1931) *J. Allergy*, 2, 444.
Frank, D. E., Gelfand, H. H. (1943) *Ibid*, 14, 273.
Gay, L. N., Chant, E. H. (1927) *Bull. Johns Hopk. Hosp.* 40, 270.
Harley, D. (1937) *J. Path. Bact.* 44, 589.
Loveless, M. H. (1940a) *J. Immunol.* 38, 25.
— (1940b) *Sth. med. J., Alabama*, 33, 869.
— (1943) *J. Immunol.* 47, 165.
aunsell, K. (1944) *Brit. med. J.* ii, 236.
ully, M. A., Rackemann, F. M. (1941) *J. Allergy*, 12, 549.
erman, W. B., Stull, A., Cooke, R. A. (1940) *Ibid*, 11, 225.
ull, A., Sherman, W. B. (1939) *Ibid*, 10, 130.

REY HAIR IN ILL-NOURISHED CHILDREN

LUCIUS NICHOLLS
C.M.G., M.D. Camb.
COLONIAL OFFICE NUTRITIONIST, MALAYA

GREYING of the hair in ill-nourished children was ecognised several years ago. It is not uncommon in fants weaned on cereal gruels; in this case there is ome loss of hair, and the hairs grow wavy and grey nd are finer than normal. But much loss of pigment older children, however ill-nourished they may be, very uncommon.

Recently I have seen several cases in Malaya in hildren aged 5–12 years. Two were of the Malay race, nd the others were Tamils.

CASE 1.—A Tamil girl, aged 12 years, had been for some ime in a refugee camp. When first seen her hair, which had een cut short, was almost white (fig. 1). Her eyelashes were light rusty grey; her eyebrows also had lost pigment; and the ine hairs of the body were very light.

She had many other signs of malnutrition: phrynoderma typically distributed over the greater part of her body, but ot on her face, neck, hands, and feet; thickening and pigmentation of the bulba conjunctivæ of the outer and inner quadrants of the eyes; patches of erosion on the tongue; great enlargement of the liver; and emaciation. The spleen was enlarged, reaching to four finger-breadths below the costal margin; this was due to malaria. The bulba conjunctivæ probably became pigmented during years of chronically poor diet, and it was later, when the malnutrition became more severe, that the hair lost its pigment.

On a good diet, including eggs, milk, and fruit, improvement soon started, and three weeks later the pigmentation was returning to the proximal part of the hairs, and the tips of the eyelashes were a light rusty grey, the rest being black. This girl had a very dark skin, and there was no indication of loss of dermal pigment.

CASE 2.—Another girl in the camp, aged 10 years, was a less striking example, though the light appearance of the hair was sufficiently notable to render her conspicuous among other children of the same race.

CASE 3.—A boy, aged about 7 years, recovering from malnutrition, had the tips of his hairs and eyelashes of a light rusty colour, in contrast to the rest of the length of the hairs, which was black. The only other sign of malnutrition in this boy was that all his deciduous teeth were decayed, the upper incisors being reduced to blackened stumps.

CASE 4.—A girl, aged about 8 years, was an example of an earlier stage. The proximal part of each hair was white, grading in degree of pigmentation into the black distal part (fig. 2). The eyelashes showed a similar condition. This girl was emaciated, and her skin was dry and rough, with a well-marked mosaic pattern over the shins.

Many other cases have been seen, though the loss of pigment has been less than in the cases mentioned above. Usually only part of the hair is rusty, depending on whether the malnutrition is of the present or was of the past. In none of these children could any change in the texture of the hair be found; it was not finer or wavier than normal, as is the case in some ill-nourished infants. It may be that there are two types of greying of the hair due to malnutrition.

The hair of all the races of the tropics is black or nearly black; hence the diagnosis presents no difficulty, especially as the loss of pigment is seldom distributed evenly throughout the length of the hairs. It may be difficult or impossible to diagnose the condition in persons whose hair is naturally fair.

Greying of the hair has been produced in feeding experiments with animals. Pantothenic-acid deficiency in black rats is followed by loss of pigment in the fur. Necropsies on these rats reveal necrosis of the suprarenal glands, and the greying appears to be due to a loss of activities between one or more hormones and this vitamin. Some degree of greying of the fur of animals can be produced by other deficiencies than that of pantothenic acid from the diet; a deficiency of copper is an example.

Most of these children had been living largely on manioc root, and the vitamin deficiencies were multiple.

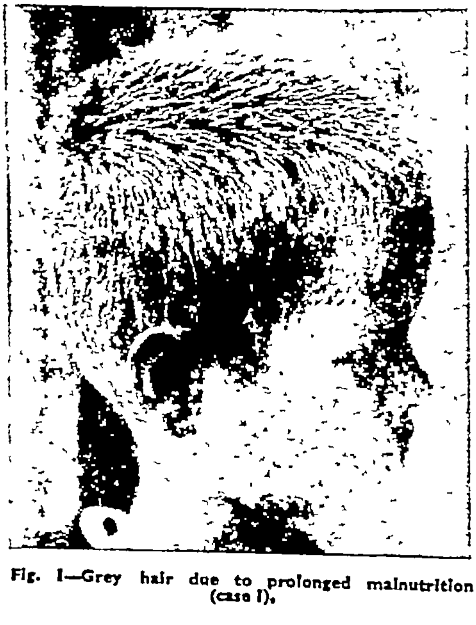


Fig. 1—Grey hair due to prolonged malnutrition (case 1).

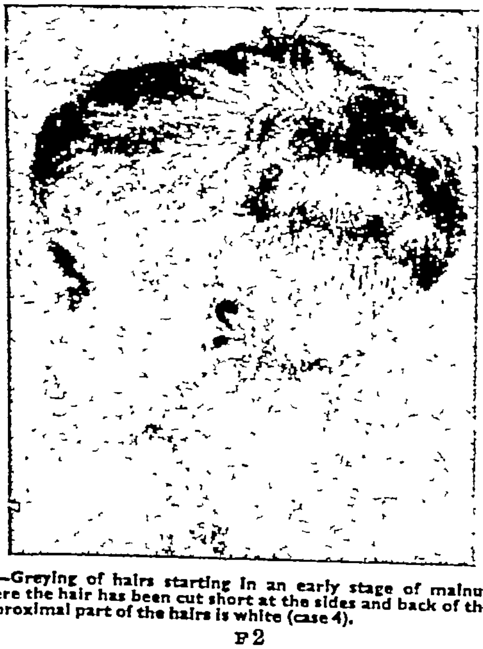


Fig. 2—Greying of hairs starting in an early stage of malnutrition. Where the hair has been cut short at the sides and back of the head, the proximal part of the hairs is white (case 4).

stance. However, the treatment, which consisted here of non-specific injections of human serum, had the contrasting result of not producing a blocking substance.

The skin-sensitivity, as measured by the threshold test, showed only a slight increase, or none, in both groups after treatment.

DISCUSSION

All published experiments on the blocking substance were done by testing the skin of non-allergic persons with mixtures of reaginic isoserum and pollen (Cooke et al. 1935, Stull and Sherman 1939, Harley 1937, Scully and Rackemann 1941, Loveless 1940a and b, Frank and Gelfand 1943). The failure of Cooke and his collaborators to demonstrate the blocking substance in *naturally* sensitive skin may be attributed to the high *test doses of* pollen used. Loveless (1940a) achieved *it readily*, but in her experiments she *did not use the skin of naturally* sensitive subjects for testing. The "direct" test, as applied in this paper, has some advantage over Cooke's indirect method. First, it was unnecessary to use volunteers for the skin titrations, as the tests were carried out in the patients. Secondly, injection with isoserum, which often produces a weal and erythema readily confused with a pollen reaction, was avoided. *Autoserum lacks that property.*

TABLE I—RESULTS OF DIRECT BLOCKING TEST IN A AND P SERUM OF POLLEN-SENSITIVE SUBJECTS

Case no.	Previous pollen or serum treatment	Total dose of pollaccine (units per c.cm.)	Threshold (units per c.cm.) * A		P		Blocking titre†	
			Poll. & saline	Poll. & serum	Poll. & saline	Poll. & serum	A	P
		GROUP I: SPECIFIC DESENSITISATION WITH POLLACINE						
1	Pollaccine 1944	710,000	0·97	0·97	1·95	125	ND	64
2	Nil	86,000	0·97	0·97	0·97	62·50	0	64
3	*Pollaccine 1942, 1943, 1944*	*100,000*	*3·90*	*3·90*	*3·90*	*62·50*	*0*	*16*
4	Nil	210,000	1·95	1·95	3·90	125	0	32
5	*Nil*	*17,500*	*1·95*	*1·95*	*1·95*	*15·62*	*0*	*8*
6	Pollaccine for 9 yr	150,000	3·90	3·90	15·62	2000	4	128
7	Nil	4000	31·25	31·25	31·25	250	0	8
8	Nil	120,000	3·90	3·90	3·90	125	0	32
9	Pollaccine for 3 yr	250,000	1·95	1·94	3·90	250	0	62
10	Nil	2500	31·25	31·25	31·25	500	0	8
11	Nil	240,000	0·49	0·49	0·97	15·62	0	16
		GROUP II: NON-SPECIFIC INJECTIONS OF ISOSERUM						
		Doses of isoserum (c.cm.)						
1	Nil	4 × 20	3·00	3·90	7·81	7·81	ND	0
2	Nil	4 × 30	0·49	0·49	0·49	0·49	0	ND
3	Nil	2 × 20 2 × 30	0·49	0·49	0·97	0·97	0	0
4	Nil	2 × 30	3·90	3·90	3·00	3·90	ND	0
5	Nil	60 30 60	1·95	1·95	1·95	1·95	0	0
6	Nil	20 30	0·49	0·49	0·97	0·97	0	0
7	Nil	20 30	31·25	31·25	31·25	31·25	0	0
8	Nil	20 30 30	500	500	1000	1000	0	0
9	Nil	10 10	500	500	500	500	0	0
10	Nil	30 30	0·97	0·97	1·95	1·97	0	0
11	Nil	30 30	0·07	0·97	0·97	0·07	0	0
12	Nil	5 × 30	1·95	1·95	3·90	3·90	0	0
13	Nil	6 × 30	125	125	125	125	0	0

* The "threshold" value is the strength of the weakest solution of pollaccine which gave a positive reaction.

† The "blocking titre" is the ratio of the threshold value of the pollaccine-serum mixture to that of the pollaccine and carbol-saline mixture. ND = not done.

TABLE II—TYPICAL RESULTS OF DIRECT BLOCKING TEST IN A AND P SERUM OF A POLLEN-SENSITIVE SUBJECT

Intradermal tests (0·05 c.cm.) with equal amounts of pollaccine and saline; pollaccine and serum A; and pollaccine and serum P. (Pollaccine used in serial dilutions.)

Pollaccine (units per c.cm.)		Feb. 20, 1945, A		June 4, 1945, P		Blocking titre	
Total for treatment 1945	Test dose	Poll. & saline	Poll. & serum A	Poll. & saline	Poll. & serum P	A	P
710,000	0·49	–	–	–	–	0	64
	0·97	+	+	–	–	..	..
	1·95	+	+	+	–	..	..
	3·90	++	++	++	–	..	..
	7·81	++	++	++	–	..	..
	15·62	++	++	++	–	..	..
	31·25	+++	+++	++	–	..	..
	62·50	..	..	+++	–	..	..
	125	..	..	+++	+	..	..

The results in group I confirmed the observation that a blocking substance develops in specifically treated hay-fever subjects, and its relation to the dosage of pollen (Loveless 1943). Whether the induction of an inhibiting substance is the cause of the clinical improvement has not yet been decided. In this small series the titre of the blocking antibody and clinical improvement were parallel.

The results in group II showed the failure to induce an inhibiting antibody in hay-fever subjects treated non-specifically by injections of human isoserum. It may seem surprising to have chosen for immunisation a "homologous" protein. However, there is some reason to believe that autoserum only lacks antigenic properties. In previous experiments (Maunsell 1944) I showed that hay-fever subjects and other persons with a similar type of allergy tended to react to their first transfusion of pooled human serum with an urticarial rash, but that they did not respond in the same way after repeated serum transfusions. This was looked on as a desensitisation. It was hoped that the induced protective mechanism would be directed not only against the reintroduction of human serum but also against the offending allergen—e.g., pollen. Clinical improvement in patients treated in such a way gave further support to that hypothesis. The failure to produce a blocking antibody in hay-fever patients treated with serum need not necessarily mean that the assumption was wrong. It may mean that the stimulation of a blocking antibody is not the only mechanism by which protection can be induced in hay-fever subjects.

SUMMARY

A direct blocking test was worked out with the object of detecting and titrating the blocking antibody of Cooke.

The development of a blocking antibody in the serum of specifically treated hay-fever subjects was confirmed by this method. The blocking titre may be used as a guide for assessing clinical protection.

No blocking antibody was detected in hay-fever subjects treated with non-specific injections of human isoserum.

In Pruritus Ani, Anal Fissure, Neuritis, Lumbago, etc.

Proctocaine (procaine, 1·5; butyl-*p*-aminobenzoate, 6; benzyl alcohol, 5; vegetable oil to 100) is a non-toxic local anæsthetic with immediate effect which may last 28 days. It prevents all reflex movement during the critical period after operations such as those for piles and for anal fissure. It is valuable in pruritus ani, anal fissure, anal spasm, minor rectal operations, hæmorrhoidectomy and the pain afterwards, fibrositis (muscular rheumatism, including lumbago), sciatica, trigeminal neuralgia, eye pain, and crushed limbs.

Ampoules of

2 c.c in boxes of 6 at 5/- 5 c.c in boxes of 6 at 9/5½
2 ,, ,, 12 ,, 9/5½ 10 ,, ,, 3 ,, 9/5½

PROCTOCAINE

LOCAL ANÆSTHETIC – ANALGESIC

ALLEN & HANBURYS LTD · LONDON · E2
PHONE BISHOPSGATE 3201 (12 LINES) WIRES "GREENBURYS BETH, LONDON"

Reviews of Books

Treatment of Peptic Ulcer

GEORGE J. HEUER, M.D., professor of surgery, Cornell University, and surgeon, New York Hospital; with the assistance of CRANSTON HOLMAN, M.D., and WILLIAM A. COOPER, M.D., assistant professors in clinical surgery in the university. London: J. B. Lippincott. Pp. 120. 18s.

IN no field of medical practice is it more difficult to judge the efficacy of alternative forms of treatment than in peptic ulcer. The various geographical, social, and personal aspects of this disease are complex enough to daunt most statisticians, but Dr. Heuer, by a careful study of peptic-ulcer cases admitted to the wards of New York Hospital between 1932 and 1942, has made one more attempt to draw conclusions from a statistical analysis of 1139 cases. He shows the work of a modern hospital in a direct pleasant style, in spite of the burden of figures, and offers an unbiased criticism of his results and those of his staff.

Though this is essentially a follow-up record, the period is often much too short, generally only 2–5 years; but no doubt we shall hear more of these cases during the next decade. At present it is doubtful whether a statistician would accept some of the conclusions that are drawn. Perhaps it is a pity that Dr. Heuer has restricted himself so rigidly to his figures, for it is refreshing to discern between the lines his own personal views —for instance on the value of gastro-enterostomy. The value of statistical analysis of a disease in which the human element plays so large a part is necessarily limited; but, as he insists, the figures are a necessary basis on which to form an opinion.

What People Are

A Study of Normal Young Men. CLARK W. HEATH in collaboration with L. BROUHA, L. W. GREGORY, C. C. SELTZER, F. L. WELLS, and W. L. WOODS. Cambridge, Massachusetts: Harvard University Press. Pp. 135. $2.

THERE is, unfortunately, no adequate long-term inquiry on record in which competent investigators have determined, by a sufficient variety of methods and with as little prejudice as possible, their physiological and psychological findings in a group of healthy young people for comparison with the subjects' subsequent history: hence the need for a study of the kind here reported. The first task of the Grant Study investigators was to decide what they understood by "normal": as they point out, it has often been conceived as meaning "free from abnormality." They were too well aware of the disproportionate amount of attention given to the abnormal to be content with so negative an idea of normality for their study, which was designed to throw light on the nature of the people who are successful doing the world's work. For the investigators a "normal" individual is a balanced person whose combination of traits allows him to function effectively; therefore in the first instance they decided to take carefully selected Harvard students as their normal subjects. The approach was clinical, from the standpoint of medicine, physiology, psychiatry, psychology, anthropometry, and sociology. In the description of personality (which was entrusted to psychiatrists) categories and technical terms borrowed from psychopathology were strictly eschewed in favour of plain English: the investigators held that psychiatric illness represents disruption and disorder of function, not mere exaggeration of personality traits; consequently its language could not serve their purpose. Their abstention works to the advantage of the reader, who is relieved of any suspicion that the observations have passed through a distorting medium of interpretation before being presented to him.

The findings given in the book are preliminary but valuable, and in several respects in conflict with accepted beliefs. They cover personality traits; socio-economic data; athletic and other achievements; many physiological measurements taken before, during, and after work; diet; medical history; and performance in psychological tests. Because of its intention and method, this early report has something to teach, as well as to promise, those who wish to know about normal people.

A Short Practice of Surgery

(7th ed.) HAMILTON BAILEY, F.R.C.S.; R. J. MCNEILL LOVE, F.R.C.S., surgeons to the Royal Northern Hospital, London. London: H. K. Lewis. Pp. 1097. 40s.

THE 7th edition of this book will retain its place as the most popular manual of surgery for students in this country. It contains an additional 141 illustrations, bringing the total up to 1063, and it is slightly longer than the 6th edition. The illustrations are superb, clear, always apposite, and often in colour. A glossary of anatomical terms has been added which translates the picturesque old names into Birmingham terminology. The historical footnotes are good. A small book which covers so wide a field must necessarily be dogmatic but the views expressed are up to date. Small criticisms are that fig. 817, a coloured scheme of the pathology of the breast, is too compressed to be useful, and that tannic acid is advocated as the treatment of choice for burns.

New Inventions

ZYGOMATIC TRACTION FOR FRACTURE OF CERVICAL SPINE

SKULL callipers are now widely used for the application of traction in cases of fracture and fracture-dislocation of the cervical spine, but in some circumstances zygomatic traction is a useful alternative. This form of traction is, however, difficult to employ without suitable apparatus, and I have therefore had made for me by Messrs. Down Bros. a pair of hooks and a crossbar (fig. 1) which make its application a very simple matter.

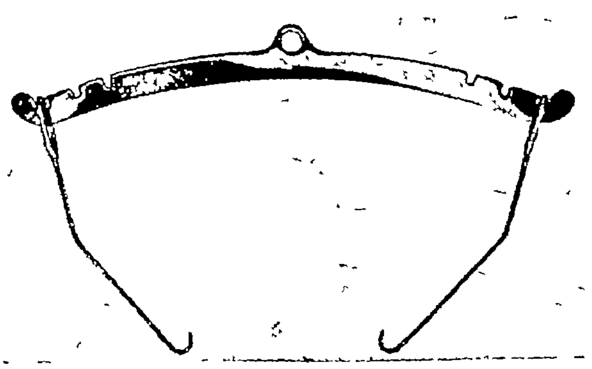


Fig. 1

The hooks can be slipped beneath the zygomatic arches (fig. 2) in a few seconds, and they are therefore particularly useful when the presence of a paraplegia makes it desirable to disturb the patient as little as possible. The slight degree of extension of the cervical spine produced by the direction of the pull sometimes helps to effect complete reduction, and I have found that heavy traction can be employed without causing the patient any undue discomfort. The hooks can, of course, be used in the first place as a temporary or first-aid measure and may, if thought desirable, be replaced later by skull callipers.

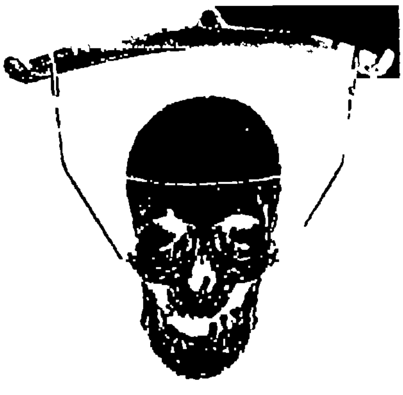


Fig. 2

J. S. BATCHELOR, F.R.C.S.

In Pruritus Ani, Anal Fissure, Neuritis, Lumbago, etc.

Proctocaine (procaine, 1·5; butyl-*p*-aminobenzoate, 6; benzyl alcohol, 5; vegetable oil to 100) is a non-toxic local anæsthetic with immediate effect which may last 28 days. It prevents all reflex movement during the critical period after operations such as those for piles and for anal fissure. It is valuable in pruritus ani, anal fissure, anal spasm, minor rectal operations, hæmorrhoidectomy and the pain afterwards, fibrositis (muscular rheumatism, including lumbago), sciatica, trigeminal neuralgia, eye pain, and crushed limbs.

Ampoules of

2 c.c in boxes of	6 at 5/-	5 c.c in boxes of	6 at 9/5½
2 ,, ,,	12 ,, 9/5½	10 ,, ,,	3 ,, 9/5½

PROCTOCAINE

LOCAL ANÆSTHETIC – ANALGESIC

ALLEN & HANBURYS LTD · LONDON · E2
PHONE BISHOPSGATE 3201 (12 LINES) WIRES "GREENBURYS BETH, LONDON"

'Benadryl'

A New Anti-allergic
and Antispasmodic
Agent for Oral Use

Benadryl is a synthetic compound which belongs to a new and distinct pharmacological group having a specific antihistamine action.

Extensive clinical studies have shown that Benadryl affords relief in a variety of allergic manifestations, including hayfever, urticaria, contact dermatitis and serum reactions. It is also effective in relieving the spasm of smooth muscle, such as may occur in dysmenorrhœa, etc.

Benadryl is administered orally and, in responsive conditions, it exerts a beneficial effect within a few hours. The most striking results reported have been in the control of symptoms associated with hayfever and urticaria.

Benadryl is issued in bottles of 50 *capsules each containing* 50 *mgm., but at present supplies are strictly limited*

A booklet describing Benadryl will be sent on request

Parke, Davis & Co., 50 Beak Street, London, W.1
Inc. U.S.A., Liability Ltd.

THE LANCET

LONDON: SATURDAY, AUGUST 10, 1946

Physiology of Convalescence

WE still know remarkably little about the physiological and biochemical changes which take place during convalescence after trauma, though some of them seem disproportionately great. These changes have been studied intensively here and in the U.S.A. in the last few years, and at the Royal College of Surgeons on July 9 Prof. JOHN BEATTIE described some observations made on patients undergoing routine operations, after accidents, or with healing wounds, in an attempt to throw more light on the fundamental processes involved.

In a group of children between 9 and 12 years old, observed in hospital for a week before and 4 weeks after tonsillectomy, the weight fell steadily in the first 10 postoperative days and did not return to normal for a month, and the fall was appreciably greater than could be accounted for by reduction in food intake. Of the possible reasons for this very constant finding some may be dismissed at the onset. It is true that normal adults lose weight merely through being confined to bed—a sort of disuse atrophy—but this does not apply to children to any great extent. Nor do the effects of anæsthesia seem to be significant. It is the action of the surgical trauma on the body's protein metabolism that is the cause; the nitrogen balance shows a deficit, due to an increased loss in the urine which corresponds closely to what would be expected if the weight-loss was entirely a loss of protein. Similar findings were obtained in a group of young soldiers submitted to appendicectomy. Whether the trauma is an accident or an operation there is a nitrogen-loss which reaches its maximum around the middle of the second week after the incident. These observations agree with those of CUTHBERTSON and colleagues[1] in experimental fractures.

It is reasonable to ask if this increased breakdown of protein is due to a need for extra energy during the recovery period. But the administration of enough added sugar to supply the energy which the lost protein would provide made no difference to the negative nitrogen balance; even when ten times this quantity was given, so that glycosuria followed, there was no significant falling off in the outpouring of nitrogen in the urine. Another possibility is that the protein is broken down to yield an agent needed for healing. A pointer in this direction is that as the nitrogen output rises, in the early days, so the urinary content of adrenal cortical hormone reaches relatively enormous levels; and the provision of methyl groups, from certain protein breakdown products, is a necessary part of its synthesis. It is possible that a particular amino-acid with a labile and readily available methyl group, such as methionine, is required to build up the level of cortical hormone. Methionine constitutes only some 3% of the body proteins, so if this amino-acid is needed for synthesis some 97% of the body proteins would have to be metabolised away in the process. The adrenal cortical hormone in the urine would, however, account for only half the lost protein, so there must be some other cause or causes.

Though we do not know why the protein-loss occurs, or why it continues for so long, BEATTIE has confirmed the observations of CROFT and PETERS[2] that it can be affected by dietetic means. During the first fortnight after trauma an increase in first-class protein intake up to 150 g. a day has no effect on the loss in the urine; but this amount of added protein does accelerate the return to a positive nitrogen balance in the second and third fortnights. The practical lesson of this work is that, though in the first fortnight after an accident or operation the nitrogen-loss cannot be influenced except by forcing the protein intake to impossible heights, in the succeeding four weeks the recovery process can be assisted by a moderate increase in dietary protein. In experimental work on Service patients the duration of treatment, and the occupation of hospital beds, fell as the protein intake rose; and the shortening of convalescence is of particular value now when the greatest number of patients must be put on the road to recovery in the shortest time because of lack of bed space. The standard King Edward Hospital Fund diet contains not much more than 60 g. of first-class protein a day; and at this level large sterile granulating wounds may make no progress to epithelisation and healing. Biopsy of the wound edge then shows a complete absence of mitosis, and skin-grafting fails though the surgical technique is above reproach. When the daily protein intake is stepped up to 150 g. mitosis begins, grafting operations are successful, and the wounds heal rapidly. Fracture union is entirely comparable, for it is a form of repair by growth, with ossification occurring in a protein matrix, and this also is held up by an inadequate protein intake.

WHIPPLE has classed the body proteins into those which are labile and can leave the cell without harm, and those essential to cell life, deprivation of which leads to coma and death. Severe trauma may cause an almost complete exhaustion of the labile reserves without any overt alteration in plasma-protein levels. This is in contrast to the chronic protein deficiency in such conditions as œsophageal carcinoma, where the blood-level does eventually fall. It is in these conditions, where there is preoperative emaciation, that successful operation is often followed by fatal coma because the reserve of labile protein is already exhausted, so that to balance the nitrogen-loss produced by operative trauma the body draws on the essential tissue-protein, with irreversible consequences American work has demonstrated the value of a high preoperative intake of protein or amino-acids in lowering mortality in these cases. The intravenous administration of amino-acids may be of great value in cases of excessive vomiting or œsophageal obstruction, when no other route is available, but in Professor BEATTIE's view it is sufficient, and perhaps better in most cases, to give them slowly by mouth or by stomach-tube. As he pointed out, it is a mistake to give too much of them—75 g. a day given in 5% solution is enough—and it is important to remember that this will all be burnt away and lost if enough sugar is not given at the same time. In most cases milk

---

[1] Cuthbertson, D. P., McGirr, J. L., Robertson, J. S. M. *Quart. J. exp. Physiol.* 1939, 29, 13.

[2] Croft, P. B., Peters, R. A. *Lancet*, 1945, i, 266.

‘Benadryl’

A New Anti-allergic and Antispasmodic Agent for Oral Use

Benadryl is a synthetic compound which belongs to a new and distinct pharmacological group having a specific antihistamine action.

Extensive clinical studies have shown that Benadryl affords relief in a variety of allergic manifestations, including hayfever, urticaria, contact dermatitis and serum reactions. It is also effective in relieving the spasm of smooth muscle, such as may occur in dysmenorrhœa, etc.

Benadryl is administered orally and, in responsive conditions, it exerts a beneficial effect within a few hours. The most striking results reported have been in the control of symptoms associated with hayfever and urticaria.

Benadryl is issued in bottles of 50 *capsules each containing* 50 *mgm., but at present supplies are strictly limited*

A booklet describing Benadryl will be sent on request

Parke, Davis & Co., 50 Beak Street, London, V
Inc. U.S.A., Liability Ltd.

THE LANCET

LONDON: SATURDAY, AUGUST 10, 1946

Physiology of Convalescence

We still know remarkably little about the physiological and biochemical changes which take place during convalescence after trauma, though some of them seem disproportionately great. These changes have been studied intensively here and in the U.S.A. in the last few years, and at the Royal College of Surgeons on July 9 Prof. John Beattie described some observations made on patients undergoing routine operations, after accidents, or with healing wounds, in an attempt to throw more light on the fundamental processes involved.

In a group of children between 9 and 12 years old, observed in hospital for a week before and 4 weeks after tonsillectomy, the weight fell steadily in the first 10 postoperative days and did not return to normal for a month, and the fall was appreciably greater than could be accounted for by reduction in food intake. Of the possible reasons for this very constant finding some may be dismissed at the onset. It is true that normal adults lose weight merely through being confined to bed—a sort of disuse atrophy—but this does not apply to children to any great extent. Nor do the effects of anæsthesia seem to be significant. It is the action of the surgical trauma on the body's protein metabolism that is the cause; the nitrogen balance shows a deficit, due to an increased loss in the urine which corresponds closely to what would be expected if the weight-loss was entirely a loss of protein. Similar findings were obtained in a group of young soldiers submitted to appendicectomy. Whether the trauma is an accident or an operation there is a nitrogen-loss which reaches its maximum around the middle of the second week after the incident. These observations agree with those of Cuthbertson and colleagues[1] in experimental fractures.

It is reasonable to ask if this increased breakdown of protein is due to a need for extra energy during the recovery period. But the administration of enough added sugar to supply the energy which the lost protein would provide made no difference to the negative nitrogen balance; even when ten times this quantity was given, so that glycosuria followed, there was no significant falling off in the outpouring of nitrogen in the urine. Another possibility is that the protein is broken down to yield an agent needed for healing. A pointer in this direction is that as the nitrogen output rises, in the early days, so the urinary content of adrenal cortical hormone reaches relatively enormous levels; and the provision of methyl groups, from certain protein breakdown products, is a necessary part of its synthesis. It is possible that a particular amino-acid with a labile and readily available methyl group, such as methionine, is required to build up the level of cortical hormone. Methionine constitutes only some 3% of the body proteins, so if this amino-acid is needed for synthesis some 97% of the body proteins would have to be metabolised away in the process. The adrenal cortical hormone in the urine would, however, account for only half the lost protein, so there must be some other cause or causes.

Though we do not know why the protein-loss occurs, or why it continues for so long, Beattie has confirmed the observations of Croft and Peters[2] that it can be affected by dietetic means. During the first fortnight after trauma an increase in first-class protein intake up to 150 g. a day has no effect on the loss in the urine: but this amount of added protein does accelerate the return to a positive nitrogen balance in the second and third fortnights. The practical lesson of this work is that, though in the first fortnight after an accident or operation the nitrogen-loss cannot be influenced except by forcing the protein intake to impossible heights, in the succeeding four weeks the recovery process can be assisted by a moderate increase in dietary protein. In experimental work on Service patients the duration of treatment, and the occupation of hospital beds, fell as the protein intake rose; and the shortening of convalescence is of particular value now when the greatest number of patients must be put on the road to recovery in the shortest time because of lack of bed space. The standard King Edward Hospital Fund diet contains not much more than 60 g. of first-class protein a day; and at this level large sterile granulating wounds may make no progress to epithelisation and healing. Biopsy of the wound edge then shows a complete absence of mitosis, and skin-grafting fails though the surgical technique is above reproach. When the daily protein intake is stepped up to 150 g. mitosis begins, grafting operations are successful, and the wounds heal rapidly. Fracture union is entirely comparable, for it is a form of repair by growth, with ossification occurring in a protein matrix, and this also is held up by an inadequate protein intake.

Whipple has classed the body proteins into those which are labile and can leave the cell without harm, and those essential to cell life, deprivation of which leads to coma and death. Severe trauma may cause an almost complete exhaustion of the labile reserves without any overt alteration in plasma-protein levels. This is in contrast to the chronic protein deficiency in such conditions as œsophageal carcinoma, where the blood-level does eventually fall. It is in these conditions, where there is preoperative emaciation, that successful operation is often followed by fatal coma because the reserve of labile protein is already exhausted, so that to balance the nitrogen-loss produced by operative trauma the body draws on the essential tissue-protein, with irreversible consequences. American work has demonstrated the value of a high preoperative intake of protein or amino-acids in lowering mortality in these cases. The intravenous administration of amino-acids may be of great value in cases of excessive vomiting or œsophageal obstruction, when no other route is available, but in Professor Beattie's view it is sufficient, and perhaps better in most cases, to give them slowly by mouth or by stomach-tube. As he pointed out, it is a mistake to give too much of them—75 g. a day given in 5% solution is enough—and it is important to remember that this will all be burnt away and lost if enough sugar is not given at the same time. In most cases milk

---

1. Cuthbertson, D. P., McGirr, J. L., Robertson, J. S. M. *Quart. J. exp. Physiol.* 1939, 29, 13.
2. Croft, P. B., Peters, R. A. *Lancet*, 1945, i, 266.

and milk products are just as valuable as the amino-acids themselves.

Professor BEATTIE's work emphasises once again the therapeutic importance of a hospital diet which is ample in all nutrients, but especially in protein, and is so chosen, prepared, and served that the convalescent patient will eat it with relish.

Sickle-cell Trait and Anæmia

HERRICK's discovery in 1910[1] of sickle-cell anæmia in a coloured medical student at Chicago revealed, almost by chance, a hereditary blood disorder at the very periphery of its world distribution. It seems clear that the sickle-cell gene originated in Africa and was carried by slaves to North and South America, but there was little precise knowledge until HUCK[2] in 1923 showed that it behaves as a mendelian dominant. As long as the diagnosis rested on the presence of sickle cells in stained films, the condition was rarely identified; for although such cells are usually present in severely anæmic patients with the disease, they may be absent from the stained film or may be confused with poikilocytes. The wide prevalence in the African races and their descendants went unrecognised until it was discovered that cells appearing normal in the stained film might show sickling under the influence of anoxæmia or alterations of pH or temperature—the change being reversible. DIGGS[3] demonstrated that sickling results from the anoxæmia produced by sealing a drop of blood under a coverslip or by placing blood mixed with 10% formalin in saline under oil. The time taken for this change to appear can be reduced by constricting the finger with a tourniquet for five minutes before the blood is withdrawn. The anoxæmic blood must be left for twenty-four hours at 37° C before sickling can be excluded; the phenomenon appears more slowly at a lower temperature, and BEET[4] has shown that sickling is not always apparent at room temperature in Northern Rhodesia at the end of twenty-four hours. Severely anæmic blood always sickles far more readily than blood which is not anæmic.

The sickle-cell gene manifests itself in two ways. Most of those whose cells sickle only when the blood is anoxæmic have no symptoms, and have a normal red-cell count, with no sickle cells in the stained film. These are examples of the "sickle-cell trait," and it is not yet clear whether a person with the trait will always remain symptom-free. It has been estimated that the trait is present in 7·3% of American negroes[5]; but the highest figure comes from the true Negroes of West Africa, among whom sickling was found in 15·5%.[6] Less commonly, the condition takes the form of a hæmolytic anæmia, and the proportion of affected persons that develop anæmia has been variously put at from 1 in 40 to 1 in 7, which means that between 22,000 and 130,000 negroes in the United States become anæmic from this cause. The fact that many patients with the anæmia do not survive to adult life may explain why this dominant mendelian gene has not become almost universal in Africa and among the American negroes. Like Cooley's anæmia (a familial disorder of the eastern Mediterranean peoples and their descendants) and acholuric jaundice (a disease largely of the Caucasoid races), sickle-cell anæmia is generally found in the children of certain families, other members of which show only the trait. The normal or increased resistance of sickle cells to hypotonic saline, and the absence of spherocytes, distinguish it clearly from acholuric jaundice, but clinically the two diseases have much in common. Fluctuating anæmia is punctuated by hæmolytic crises, with fever, splenomegaly, hepatomegaly, jaundice, and reticulocytosis and normoblasts are found in the peripheral blood. Even leucocytosis may occur; so the disease may simulate the von Jaksch syndrome or leuco-erythroblastic anæmia. The patient may complain of severe rheumatic pains, and cardiac murmurs and congestive failure may cause confusion with rheumatic carditis. Cholelithiasis may also develop. Chronic leg ulcers are common, and in Africa this anæmia may sometimes be a factor in tropical ulcer. There is often a hæmorrhagic tendency, especially to epistaxis, and thrombosis may produce symptoms in any part of the body. Abnormalities of somatic and endocrine development have been described. In Africa the condition is commonly confused with malaria, and differentiation may be impossible clinically.

Confusion of sickle cells with the demilune remains of red cells and with elliptical red cells has led to erroneous reports of sickle-cell anæmia in whites. Though the genuine condition has been reported in white Americans, it is very rare, and OGDEN[7] is convinced that all such cases have arisen from miscegenation with African stock. It has also been recorded in Canada, Mexico, South America, and other countries where African negroes have settled, but so far no case has been reported in Britain or any other part of Europe, except Portugal. The possibility of the gene accounting for obscure hæmolytic anæmias might perhaps be borne in mind; and if the test for sickling were adopted as a routine procedure whenever a coloured person had a blood-count, it is probable that the condition would be detected in many countries which have not yet reported the anæmia or the trait.

Breeding Out Intelligence

IN this year's Galton lecture to the Eugenics Society[8] Prof. GODFREY THOMSON made a disquieting statement on the trend of national intelligence. Having been particularly interested in the selection of children for prolonged school and university courses, he is fearful of the end-result of this lengthy training and the delay or failure in marriage or procreation that it entails. "The educational system of the country," he said, "acts as a sieve to sift out the more intelligent and destroy their posterity. It is a selection which ensures that their like shall not endure." Intellectuals tend to marry late, if at all, and to have small families. The general consensus of psychological opinion suggests that 50–80% of one's intellectual capacity is inherited: much less than half the differences between intelligence-test results in different individuals can be explained on

---

1. Herrick, J. B. *Arch. intern. Med.* 1910, 6, 517.
2. Huck, J. B. *Bull. Johns Hopk. Hosp.* 1923, 34, 335.
3. Diggs, L. W., Pettit, V. D. *J. Lab. clin. Med.* 1940, 25, 1106.
4. Beet, E. A. *E. Afr. med. J.* 1946, 23, 75.
5. Diggs, L. W., Ahmann, C. F., Bibb, J. *Ann. intern. Med.* 1933, 7, 769.
6. Evans, R. W. *Trans. R. Soc. trop. Med. Hyg.* 1944, 37, 281; *Ibid*, 1945, 39, 207.
7. Ogden, M. A. *Arch. intern. Med.* 1943, 71, 164.
8. *Eugen. Rev.* 1946, 38, 9.

vironmental or educational grounds. The diminhed fertility which accompanies late marriage comines with the pressure of economic circumstance to mit the families of the university-trained section of e nation, who mostly think they should have nly as many children as they can afford to educate their own standard. Hence the average level of telligence is lower in each succeeding generation ecause the more intelligent have failed to contribute heir proper quota to it.

The significance of such a statement needs no mphasis, and its basis deserves close examination. n a survey of the results of intelligence tests in a roup of nearly 3000 school-children, THOMPSON and UTHERLAND found that there was a negative correation (r=−0·25) between intelligence quotient and ize of family. This means that, in 60% of the amilies studied, smallness of family was associated with mental ability above the average. There is a onsistent trend from the 66% above-average intellects n only children to the 39% above-average intelligence-test results in families of over seven. That this was not wholly due to differences in home environment was shown by subsequent demonstration of a similar association in the children of miners on the same social level. Further, a similar survey of intelligence among children whose parents were moving from slum to new housing areas, and for whom all the relevant social and environmental data were available, showed precisely the same association, even when these social factors had been taken into account in the statistical analysis. This earlier work was strikingly confirmed by a very comprehensive study, by FRASER ROBERTS and his associates, of intelligence among an entire age-group of the children of Bath. They too showed this definite negative association between the children's intelligence quotient and the size of the family to which they belonged.

Attempts have been made by LENTZ and R. B. CATTELL to estimate the decline in the average intelligence level, from one generation to the next, which may be expected from the difference in reproduction-rate between the more and the less intelligent families. These attempts were open to serious statistical criticism, but recently R. A. FISHER has evolved a particularly neat method of estimating, from the results of intelligence tests on children of the present generation, the average level of intelligence in the previous one. When this technique was applied to THOMSON's data it became clear that there was a decline of 2 points in the Binet intelligence scale between one generation and the next. At least some of this deterioration is due to what is in effect a partial sterilisation of the more intelligent section of the nation. Before positive measures are taken to diminish this adverse trend, however, the practical men of affairs responsible for these measures will need even more striking proof of the menace to the national future which these results imply. Professor THOMSON himself thinks that a more direct experiment involving 50,000 children over a period of five years might be enough to show the downward trend. He has no faith himself that there has been any change in the essential nature of intelligence, from ability to appreciate abstract conceptual relationships to a more practical sort of ability stimulated by the increasing mechanisation of life. As he points out, it is on men possessing the former type of intelligence —the designers and inventors—rather than on the technicians that we depend for progress in the modern world. In framing measures of social and economic policy such as family allowances, this country cannot afford to consider merely the quantity of the succeeding generation. We are faced with the question how its intellectual quality can be improved by encouraging —by economic means or otherwise—an increased birth-rate among the more intelligent.

Annotations

UNIVERSITY EXPANSION

IN the past two years the Exchequer grant to the universities has been raised from £2 million to £9 million. Now by extending their terms of reference (see p. 217) Mr. Dalton has given the University Grants Committee elbow room to make the most of the opportunity he is offering them. To the committee's present duties of inquiring into the needs of the universities and advising the Government on the application of grants has been added the further charge of helping in the preparation and execution of plans to develop the universities so that they are fully adequate to national needs. The Barlow [1] and Clapham [2] reports have already shown that the need is real, and in the *Times* of Aug. 1 Sir Ernest Simon, chairman of the council of the University of Manchester, suggests that in the next ten years the universities will probably be asked to double their output of students, and at the same time greatly expand the amount of research they undertake. Medicine has always claimed from the universities a large proportion of each year's graduates. In the future it is likely to become still more exigent, and the profession will welcome these parliamentary preliminaries to academic expansion.

LABORATORY DIAGNOSIS OF SMALLPOX

WHILE the clinical diagnosis of typical smallpox is not difficult, the return of infected soldiers from endemic areas has emphasised again that atypical cases may tax the skill of the most experienced observer. In partially immune subjects smallpox, like other diseases, is often mild, but the virus may still be highly virulent and produce severe lesions in susceptible people. Downie,[3] in a timely review of the laboratory methods now available for identifying smallpox, points out that diagnosis may be made either by detecting the variola virus or by serological tests. Of the older methods Paul's test is no longer thought reliable, and with other animal tests the result may take three or four days. Inoculation of the chorio-allantoic membrane of the developing hen's egg has the same disadvantage, though this technique may be useful in distinguishing smallpox from generalised vaccinia. A more valuable approach is the direct microscopical examination of early lesions as employed by van Rooyen and Illingworth.[4] Preparations are made by scraping the base of papules and vesicles, and, after transferring to a clean glass slide, staining by Paschen's method. Rapid results are obtained but it requires skill to identify the elementary bodies, and the test loses reliability as the disease progresses. Most of the serological methods now in use depend on a reaction between antigenic material collected from the patient and a potent antivaccinial serum prepared in rabbits. The ordinary serological method of detecting antibody in the patient's serum is not so satisfactory, because it cannot be demonstrated in the first week of the disease and because recently vaccinated people may give a

---

1. See *Lancet*, June 8, p. 859.
2. *Ibid*, July 27, p. 141.
3. Downie, A. W. *Month. Bull. Min. Hlth & E.P.H.L.S.* 1946, 5, 114.
4. van Rooyen, C. E., Illingworth, R. S. *Brit. med. J.* 1944, ii, 526.

positive test. Undoubtedly the best available method is the complement-fixation test in which the antigen is obtained from the contents of six vesicles or a similar *number of crusts from a suspected patient.* With this test Downie got positive results in all of 22 confirmed cases of smallpox in 12 different outbreaks in this country, and he has yet to get a false positive from cases of chickenpox, zoster, or other skin conditions clinically suspect. According to W. J. Tulloch, who has had considerable experience of the test in Scotland, the complement-fixation test in smallpox is more satisfactory than the examination of throat swabs in the diagnosis of diphtheria. The value of the test lies not only in its reliability from the early vesicular stage to the later crusting stage of the disease but in the fact that a definite report can usually be given within 24 hours. With vaccination against smallpox no longer a national custom, accurate and rapid diagnosis has become more important than ever.

DIPHTHERIA IN SCANDINAVIA

QUITE a crop of articles on various aspects of diphtheria has appeared in the Scandinavian medical press *during the past year, and several of them mark an* advance in knowledge. Vogelsang and Kryvi[1] give an account of Schick's reaction carried out on adults during an epidemic of diphtheria in Bergen, and Hognestad[2] reports on diphtheria vaccination in Bergen between 1940 and 1944. Böe[3] discusses diphtheria in the first year of life, and Kahrs[4] retails his experiences of laryngeal diphtheria in a hospital in Stavanger.

More recently Ipsen,[5] of Copenhagen, has made a detailed statistical analysis concerning diphtheria *immunity of adults in that city. He points out that diphtheria immunisation,* which in 1944 was extended to more than 90% of the children in Copenhagen between the ages of 4 and 15, had greatly reduced the diphtheria morbidity among children. But to judge by the great diphtheria morbidity among adults, "the bacillus of diphtheria is more prevalent in 1944–45 in the population of Copenhagen than it has ever been in the last 25 years." A report by Lassen[6] (in charge of the Blegdams Fever Hospital in Denmark) and his associates shows that in the autumn of 1941 the health authorities in Copenhagen set an intensive campaign on foot in favour of immunisation, and this measure was held responsible for a remarkable decline in diphtheria admissions in 1942 to this hospital, the number (50) being the lowest since it was opened in 1879. However, next year, 1943, brought an ominous change in the virulence of diphtheria bacilli; the gravis type, hitherto quite rare, was introduced by the invading Germans. During the winter of 1943–44 a total of 403 cases were treated at the Blegdams Hospital. But as over 90% *of Copenhagen's school-children had been vaccinated* against diphtheria since 1941, no less than 70% of the patients were adults. Not one of the 36 who died had been immunised, but among the unprotected the death-rate was high and in them the course of the illness seemed to be the same whether they had had a previous attack or not. As 73% of the patients had never been immunised there is evidently still much room for improvement in this direction.

Mortensen,[7] of Denmark, also makes a powerful plea for immunisation. His study deals with 573 cases of diphtheria covering a six-year period, 1939–45. While the fatality-rate was 9·3% for the unprotected, it was 1·1% for the protected, among whom complications were comparatively rare and the illness comparativ mild. In the first part of his period the intermed type predominated, whereas in the latter part mitis a gravis were most prominent. The last-named was c and away the most common find in "carriers." A b gish rise in the diphtheria morbidity in 1944–45 could t traced to several different factors, one of which was th among the immunised there were a considerable numb of carriers, and slight cases of diphtheria were oft overlooked. This shows the desirability of extend protection to every member of the community; wit also the fact that in this study there were nine patie over the age of 60, all of whom had not been vaccinat and three of whom died.

TOMORROW'S BREAD

BY a series of improvisations the worst ills of famin that threatened to beset two continents have so far bee averted. The question in Central Europe has been, ca rations be maintained, until the harvest is gathered, at th new low levels adopted in the spring? If they are maintained, then widespread famine and unrest can probably be avoided; if, on the other hand, they fall appreciably the consequences will rapidly be disastrous. It is now believed that the position can in fact be held until the harvest now being gathered brings relief. But it will ta some time for the year's wheat to be transported a distributed, and even then not all the peoples of Euro are likely to be sure of the daily 2000 calories which the minimum aim of the Food and Agriculture Organi tion (F.A.O.).

In the *Second Review of the World Food Shortage*,[1] t present situation and the outlook for 1946–47 are co sidered. In the United Kingdom existing scales will, seems, be at least maintained. The only doubt of t ability to continue the meat-ration of recent months raised by the increasing prices charged by some exporti countries. Milk-production, now at about pre-war lev may fall slightly through decrease in feeding-stuffs; co sumption of milk is a third greater than before the w but it may be possible to equalise the balance by impo ing milk preparations. There is little hope of improv distribution of oils and fats, since the world shorta will probably remain acute for at least a year, and th improve only slowly. World supplies of sugar will, is thought, rise in the coming twelve months; but t need to re-establish stocks may delay increased co sumption. The general outlook is still sombre, but h and there the clouds are broken.

The introduction of bread-rationing is discussed some length. Since the beginning of the year vari measures have been taken to reduce the requireme of flour. The extraction-rate has been increased p gressively from 80% to 82½%, 85%, and, on May 12, 90%. In April the weight of the 2 lb. loaf was diminish to 1¾ lb., and biscuit production was reduced by 25 An economy campaign was launched, and the use bread in restaurants was restricted. It was calculat nevertheless, that by the end of August the stock wheat and flour would fall to 800,000 tons. This is eig weeks' supply, which might appear, with the promise the harvest, to be enough to tide the country over. B this was working stock, with no allowance for the rese essential if local shortages and breakdowns are to avoided. Local shortages, it was argued, would ha soon become generally known, and this would have l to the purchase by consumers of more flour than w needed, and thus to the widening of the area of shorta and finally to a complete breakdown in distributio Some critics have pointed to the larger bread-rations, a to the better food in general, that can be procured on t Continent, as arguments against this further restrictio

---

1. Vogelsang, T. M., Kryvi, B. O. *Nord. Med.* Oct. 5, 1945, p. 2021.
2. Hognestad, H. *Ibid*, p. 2026.
3. Böe, J. *Ibid*, p. 2030.
4. Kahrs, T. *Ibid*, p. 2034.
5. Ipsen, J. *Ibid*, March 22, 1946, p. 630.
6. Lassen, H. C. A. *Ugeskr. Laeg.* May 23, 1946, p. 499.
7. Mortensen, V. *Ibid*, June 27, 1946, p. 629.

---

1. Cmd. 6879. H.M. Stationery Office. Pp. 35. 6d.

t where the visitors' food is best, there the black market most flourishing, and there also the poorer people are sest to starvation. The ration of bread is not, in self, a guide to a country's nourishment, for some of the untries that have the highest ration of bread are faring orst in total calories. Because of more-or-less even dis- ibution, supplies of food in Britain may seem austere ; t in fact they approximate more closely to those in e food-exporting countries than to those in Europe.

The report records a progressive fall in stocks of food d feeding-stuffs in this country from 5·4 million tons the end of June, 1945, to 3·7 million tons at the end of une, 1946 ; and they are expected to fall to about ·4 million tons by the end of this month. The United ingdom, it is concluded, can make no further sacrifices bridge the gap between world import requirements and xportable supplies.

THIOURACIL

THREE years have passed since Astwood's paper[1] rought hope that thyrotoxicosis might be controlled y swallowing tablets. Clearly thiouracil is no more he final answer than is thyroidectomy ; but though the eal cause of the trouble—the *causa causans*—still emains a mystery, most reports on its clinical use ave been favourable, and the alarming accounts of granulocytosis which tempered early enthusiasm have een followed by mass statistics and individual papers howing that the risk is slight, though sufficient perhaps o discourage the general use of thiouracil outside ospitals where patients can be properly supervised.

Since our last review of the position in this country nd the United States[2] Professor Meulengracht and his olleagues have described their experience in Denmark.[3] Opportunity was enhanced for them by an " epidemic " of thyrotoxicosis which began in 1941, reached its peak in 1944, and now seems to be subsiding.[4] Altogether, 144 patients have been treated over a period of three years, including 100 primary goitres, 23 secondary goitres, and 10 postoperative relapses. Thyroidectomy was carried out in 10 cases for various reasons, sometimes in order to study the effect of thiouracil as a preoperative measure. The aim of treatment was permanent cure and not merely control of the disorder until a natural remission set in or the patient was fit for operation. Dosage was essentially the same as that in general use, and was varied according to individual needs. Methyl thiouracil, the form adopted by Meulengracht, is easier to produce, and therefore less expensive, than thiouracil ; it is at least equally effective, and toxic reactions are probably less common. The patients, who were not strictly confined to bed, were given phenobarbitone as a general sedative. The average stay in hospital was one month, and thereafter treatment was continued at home. The usual follow-up clinics were held and the patients were told that should fever, sore throat, or a rash develop they must stop taking the tablets and report at once. Meulengracht prefers this to repeated blood-counts. Some physicians in this country have reached the same conclusion, since the blood may be normal one day and severely leucopenic the next; and in any case leucopenia may cease spontaneously even though the drug is continued.

Immediate results were uniformly good, no case failing to respond. The average duration of treatment was 8–9 months and of follow-up 9–10 months. Early relapses sometimes followed premature discontinuance of the drug, but in 60 cases where treatment was stopped altogether there were only 5 relapses, all mild. Exophthalmos, in time, almost always disappeared, or nearly so. The goitre was usually unaffected, but in 15 cases it diminished or disappeared. Occasionally the swelling increased, especially when the basal metabolic rate had fallen to about normal.

Complications were few : 3 patients who developed drug fever were referred for operation ; occasional rashes and mild conjunctivitis did not interfere with treatment ; and agranulocytosis was not seen at all. Meulengracht points out that an operative mortality of 2% must be considered minimal, whereas deaths from agranulocytosis after treatment with methyl thiouracil were under 0·5% in an American series of 5745 cases,[5] and this is probably a maximal figure since it covers early days when experience was being gained. Moreover, major complications such as thyrotoxic crises, tetany, and injury to the recurrent laryngeal nerve may follow operation, and relapses are quite common. There is no doubt that the results achieved by surgery are impressive ; but most patients prefer medical treatment. They can return to work once control has been achieved, and in some clinics mild cases are treated as outpatients from the beginning. It is true that supervision is more difficult and takes longer ; but patients rarely object to this, and those in a hurry can still take the short-cut offered by surgery.

Meulengracht's results are in keeping with those obtained in this country, though some physicians and surgeons still remain sceptical of thiouracil's value. The all-important requirement for safety is cooperation between patient and doctor ; the natural history and variable course of thyrotoxicosis must be remembered, and an effort must be made to understand the whole patient and her environment, as well as those personal problems which so often seem to act as precipitating factors in predisposed individuals. It is useless to deal with the thyroid and ignore the chronic vague ill health of which the thyroid disorder may be but a part. As a preoperative remedy there is little doubt that thiouracil is valuable, especially if iodine is given during the last 2–3 weeks to diminish the gland's vascularity. Ten years ago Sir Thomas Dunhill[6] emphasised that some patients cannot be made safe for operation, even with the help of iodine; but this group may now be reduced or even eliminated, especially as patients are nowadays rarely left untreated until they are seriously ill.

It is still far too soon to dogmatise or to speak of permanent cure with thiouracil. It seems, however, that the ideal case for the drug is probably the patient with early primary thyrotoxicosis. Nodular goitres take longer to respond, and there is some evidence that they are more likely to relapse[7] ; so, even apart from cosmetic considerations or pressure symptoms, it may be better for the patient to undergo thyroidectomy ; and Beierwaters and Sturgis[8] recommend the operation in any case because of the risk of malignant change, though this view is debatable. Relapses following discontinuance of the drug are most likely to occur within two months if the drug has been given for less than about six months. Remissions after lengthier treatment are much more likely to be permanent, according to follow-up reports so far published.[8, 9]

DENTAL RESEARCH UNIT FOR LONDON

THE Medical Research Council have arranged with the medical school of King's College Hospital for the establishment of a dental research unit there, under the direction of Mr. J. D. King, PH.D., L.D.S., of their scientific staff.

---

1. Astwood, E. B. *J. Amer. med. Ass.* 1943, 122, 78.
2. *Lancet*, 1946, i, 508.
3. Meulengracht, E., Kjerulf-Jensen, Kai Schmith. Paper read at 20th Scandinavian Congress for Internal Medicine, Gotenburg, Sweden, June 27–29, 1946.
4. Meulengracht, E. *Acta med. scand.* 1945, 121, 446.
5. Van Winkle, W., et al. *J. Amer. med. Ass.* 1946, 130, 343.
6. Dunhill, T. *Brit. med. J.* 1935, ii, 1034.
7. Palmer, M. V. *Ann. intern. Med.* 1945, 22, 335.
8. Beierwaters, W. H., Sturgis, C. C. *J. Amer. med. Ass.* 1946, 131, 735.
9. Barr, D. P., Schorr, E. *Ann. intern. Med.* 1945, 23, 754.

Special Articles

SHORT-CUT METHOD IN APPLYING NUTRITIONAL PRINCIPLES

THE Preparatory Nutrition Committee of the Food and Agriculture Organisation of the United Nations has adopted (in a report dated May 20, 1946) proposals made by two of their members for a short-cut method of applying nutritional principles to the international distribution of foodstuffs. These principles are applicable to the long-term policy of the F.A.O. as well as to short-term practice during the world food emergency, but they should be of special value in this emergency as simplifying administration.

The need for applying nutritional principles was emphasised in a statement by the British Food Minister in September, 1945, and the authors quote it as expressing their views. The Minister said: "If there is to be any equity in the distribution of limited food-supplies between different countries, it is necessary that we should be able to assess for each country its essential human needs, and to know the extent to which these needs can be met from home production or from existing stocks. Only by having this information available are we able to assess fairly the claims of each country for a share in the world supplies or, in the case of the exporting countries, the shares which they may reasonably be expected to contribute to the common pool. . . . It is dangerous to consider meat or fats or grain in isolation. We must also consider the total supplies and dietary of each country. Advances in nutritional science have enabled us to estimate, in a way which was not possible before, the food requirements of a population."

The fact that there are, in practice, other considerations than nutritional needs which influence allocations of foods (for instance, transport) does not decrease the necessity for this nutritional background. To work out everything de novo and apply physiological principles of nutrition separately to each case under consideration is a lengthy business.

The short-cut method tackles the problems of applying nutritional criteria so as to meet "practical operators" half-way (or more than half-way) and find a means of bridging the gap between principles and practice. It must fulfil three indispensable requirements: (1) it must be in commodity terms rather than in terms of nutrient elements; (2) it must group commodities in the categories that are most significant from the nutritional point of view, but which are, at the same time, convenient for the allocating authorities; and (3) the amount of supporting data must be kept to a minimum.

The authors of the plan squarely face the difficulties, the first of which is that in some countries the necessary data about food conditions are not available. They concede this but say it is also true that "there are many countries for which reasonably good food-supply estimates do exist, and in all cases better information could be obtained if the requisite steps were taken to secure it." There must be an improvement in fact-finding services and the development of closer working relations between research-workers and the officials responsible for policies and programmes. There are real difficulties; but, as the authors of the plan say, "War-time experience in dealing with food estimates, as with other problems, has shown that where there's a will there's a way."

TECHNIQUE

The technique of the short-cut method depends on the application of two simple sets of tables called "ready reference tables" and "ready reckoning tables."

These tables allow for the fact that neither "imp requirements" nor "exportable surpluses" are on absolute quantities. The more urgent the needs o the deficit countries, the greater should be efforts supplying countries to expand their exports. Conversel the larger the volume of imports that can be provid for deficit areas, the less urgent will become t needs which still remain unsatisfied. Many of the facto to be considered in the allocation of food-supplies a interdependent variables. A practical system f examining them in their relations to one another m therefore make use of sliding-scales rather than of rig predetermined standards. For that reason the requir-ments analysis tables which are given show the relativ levels of consumption that would result from impor and exports of varying volumes.

The short-cut method focuses attention on th balancing of needs and supplies for a twelve-mon period. It is necessary to plan ahead for the whole of t time between one harvest and the next.

Analyses resulting from the use of these tables gi appropriate weight to each of the two most importa considerations in the appraisal of food requirements (1) basic physiological needs; and (2) customary foo habits as reflected in pre-war diets.

In the interests of simplicity, products are dea with in four major commodity groups that are importa in international shipments:

(1) Cereals.
(2) Fats and oils (visible).
(3) Protein-rich foods, comprising milk and milk produc except butter (in terms of their content of solids, fat a non-fat), meat, poultry, fish, eggs, pulses, and nuts.
(4) Sugar.

Though cereals rank first in importance among t foods required for relief, it is analytically convenient consider them last. A distribution of cereals can th be made which takes into account the contribution th will be made to the diets of the different countries b non-cereal imports. Accordingly, needs in relati to supplies will first be considered for fats and oi protein-rich foods, and sugar. Among the protein-ri foods, separate analyses should be made: for mi because of its special combination of nutritive value for other animal products, because of the preferen consumers have for them; and for pulses and nu because they provide an economical means of meeti protein requirements.

When allocations of these non-cereal foods have be actually or tentatively established, the additio calories thus provided per head per day for consum in deficit countries can be quickly calculated by usi the coefficients in reference table IV. These would added to the calories which, it is estimated, will obtained from indigenous supplies (see reckoning table Corresponding adjustments for supplying countries c be similarly made. When this has been done, the resulti calorie-consumption levels for the various countr can be used directly as a basis for the allocation available cereal supplies. (See reference table V a reckoning table 5.)

This simple treatment of cereals, as a balancing fac in making up calorie deficits, does not indicate a disregard for their importance as sources of prote iron, thiamine, and other nutrients. On the contra it is because of the general nutritional value of cer foods, as well as because of the special importa of calories in low-level emergency diets, that t short-cut method of requirements analysis can recommended for adoption.

PRINCIPLES ADOPTED IN DESIGNING THE TABLES

In these tables the minimal physiological requireme (related to the "temporary maintenance" level in t rt of the Preparatory Nutrition Committee of .O.) which have been taken to represent needs so nt that they must be given a top-priority claim on plies are as follows. They are calculated in terms of ional per-caput average supplies at the retail stage.

ereals.—No minimum is set in commodity terms. Quantities ld depend on the calorie deficit.

ats and Oils (*Visible*).—The amount allowed per head year in terms of net fat-content is 10 kg., which would vide about 28 g. per head per day and supply approximately 10% of the calories in the "emergency subsistence iet." In cases where the average pre-war consumption was ss than 10 kg. this is taken as the minimum. It would e met but not exceeded.

REFERENCE TABLE I—FATS AND OILS *

ountry	Population (millions)	Pre-war consumption (kg./head yr.)	Annual supplies (in 1000 metric tons) needed to provide a minimum (10 kg. per head per year or pre-war level if lower) or the indicated percentages of pre-war consumption if they are higher				
			60 %	70 %	80 %	90 %	100 %
minaria	40	14	400†	400†	448	504	560
rvania	3	23	41	48	55	62	69
ngerland	15	7	105‡	105‡	105‡	105‡	105‡
rplustate	140	20	1680	1960	2240	2520	2800

* Fat-content basis. † Established by minimum of 10 kg.
‡ Established by pre-war level less than 10 kg.
A metric ton = 1000 kg. = 2204 lb. avoirdupois.

Protein-rich Foods.—The amount allowed is 30 kg. per head er year in commodity terms. This quantity of these foods, easonably assorted, would provide about 15 g. of protein er head per day. Where pre-war consumption was less than 30 kg. this would be taken as the governing level. It would be met but not exceeded.

REFERENCE TABLE IV—CALORIE COEFFICIENTS * FOR NON-CEREAL GROUPS

Country	Cals./head/day from 1000 metric tons of supplies per year		
	Fats and oils	High-quality protein group	Sugar
aminaria ..	0·61	0·2	0·28
tarvania ..	8·0	2·66	3·67
Hungerland ..	1·6	0·53	0·73
Surplustate ..	0·17	0·06	0·08

* Approximations only for protein group.

Sugar.—The amount allowed is 10 kg. per head per year, or the pre-war level if that was lower.

When once the minimal requirements, as suggested, have been met, the distribution of additional supplies should be determined on a basis that gives recognition to the importance of established food habits and customary patterns of consumption. The most practical means of doing this is to relate allocations to the pre-war consumption levels in the different countries concerned. A ready and flexible method for doing this is provided in the requirements analysis tables.

REFERENCE TABLE V—PRE-WAR CALORIES AND CEREAL COEFFICIENTS

Country	Pre-war calorie levels	Cereals per year providing 100 cals./head/day* (metric tons)
Faminaria ..	2850	493
Starvania ..	2700	37
Hungerland ..	2700	185
Surplustate ..	3080	1943

* Assuming 90 % extraction in Europe and 80 % in U.S.A.

RECKONING TABLE 1—FATS AND OILS *

Country	Estimated indigenous supplies for consumption, 1946–47	Deficits and excesses, for 12 months, at indicated levels (1000 metric tons)									
		60 %		70 %		80 %		90 %		100 %	
		Def.	Exc.	Def.	Exc.	Def.	Exc.	Def.	Exc.	Def.	Exc.
Faminaria	250	150	..	150	..	198	..	254	..	310	..
Starvania	20	21	..	28	..	35	..	42	0	49	..
Hungerland	105	0	0	0	0	0	0	0	0	0	0
Surplustate	2500	..	820	..	540	..	260	20	..	300	..
Total ..		171	820	178	540	233	260	316	0	659	0

* Fat-content basis.

RECKONING TABLE 4—CALORIE LEVELS WITHOUT CEREAL IMPORTS

Country	Estimates of cals./head/day obtained from indigenous supplies plus or minus non-cereal imports or exports				Total
	Indigenous supplies	Fats and oils imported*	High-quality protein foods imported†	Sugar imported‡	
Faminaria	1900	121	130	32	2183
Starvania	1000	280	250	261	1771
Hungerland	2000	0	131	4	2135
Surplustate	3300	(−40)	(−58)	(−15)	3187

* Assuming level of 80 % of pre-war
† Assuming level of 90 % of pre-war
‡ Assuming level of 70 % of pre-war
} indigenous supplies for receiving countries.

The following data are necessary for the preparation of the tables:

(1) current population estimates;
(2) pre-war per-caput consumption estimates for the three major commodity groups (fats and oils, protein-rich foods, and sugar) and for total calories;
(3) calorie coefficients for these three groups; and
(4) current estimates of consumption from indigenous supplies in terms of the same three commodity groups and in terms of calories.

RECKONING TABLE 5—CEREALS

Country	Cereal imports needed on an annual basis to bring consumption in deficit countries to indicated numbers of cals./head/day (1000 metric tons)					
	1800 cal.	2000 cal.	2200 cal.	2400 cal.	2600 cal.	2800 cal.
Faminaria ..	0	0	83	1069	2055	3041
Starvania ..	11	85	159	233	307	381
Hungerland ..	0	0	324	694	1064	1434
Surplustate ..	0	0	0	0	0	0

The reference tables, once prepared, would require revision only if populations changed or new estimates of pre-war consumption levels had to be introduced. The reckoning tables would have to be adjusted quarterly to the latest estimates of indigenous production, and the cereals table would have to reflect changes in non-cereal allocations. The way in which these tables would be made up is shown in the accompanying hypothetical reference and reckoning tables compiled for four imaginary countries.

Reconstruction

ONE THOUSAND BEDS?

FROM A CORRESPONDENT

Mr. ANEURIN BEVAN made one of his most penetrating remarks when, in the standing committee, he declared that the quality of a hospital service is determined not only by the way in which it is financed but also by the quality of the people who work in the hospital, and on their freedom from bureaucratic interference. But it is fair to ask Mr. Bevan, what does he mean by "hospital"? If he means, instead of the common connotation, a 1000-bed unit comprising many hospitals, will such a "hospital" be free of bureaucratic interference? The headquarters of this 1000-bed unit could easily become itself a focus of bureaucracy, in relation to the individual hospital.

There is grave danger that the conception of the 1000-bed unit may come to be embodied in the new hospital service *without adequate examination.*

ADVANTAGES AND DISADVANTAGES

First, then, what can be said in favour of the idea? It has been suggested that 1000 beds are needed to constitute a complete unit for hospital purposes, providing staff and facilities sufficient for all the various specialties to be found in a complete hospital service. It is true, too, that from most of the surveys—the South Wales survey is an instructive example which may well have had a special influence on the Minister—there emerged a clear case for grouping under one control a family of hospitals of varying sizes. The Welsh valleys need a hospital *of some consequence in the principal town,* with a group of smaller units strung out along the valley. There is in fact a strong case here for unified management, with proper delegation of responsibility for the smaller units to house-committees. In other parts of the country there are further examples which support the view that grouping under a single management committee is a natural and logical development of hospital organisation, leading to economical grouping of consultant staff and special departments.

But from the premise that in many cases, and from some angles, grouping is desirable, and that 1000 beds provide the most convenient unit, it does not necessarily follow that division of the country into 1000-bed units ought to be regarded as an overriding objective. Can it seriously be suggested that the principle of aggregation of units to make up 1000 beds ought to be pressed as against all other considerations, including convenience of management? For many small towns and for many suburban areas a hospital of 200–250 beds (including provision for chronic cases and for maternity wards), with perhaps one or two satellite cottage hospitals acting under its control, is much to be preferred. If units of this kind are grouped with anything and everything that may happen to be handy, or if two or three such units are grouped together merely for the sake of securing a 1000-bed unit, no advantage can be expected sufficient to offset the very real loss of convenience of management on the spot by local people.

It is one thing arbitrarily to decide what constitutes a complete unit for hospital purposes, but it is quite another thing to assert that this is the only satisfactory unit for purposes of management, irrespective of the difference in conditions in different parts of the country, and of the fact that in the great majority of cases various special functions must, for a long time to come, be provided where the facilities are at hand.

WH ED

What is undoubted ensuring that the hospital se s to a plan, that services and departments are not unwisely duplicated, and that *patients find their way into that* hospital which is best fitted to deal with them.

To achieve this it is not essential to group hospitals arbitrarily into 1000-bed units regardless of all other considerations. Admittedly smaller units may not be able to offer all the services, but the exercise by a regional board of an effective control of function (as distinct from management) will surely bring about the desired result. The size of the groups should be determined by practical considerations, in which geography and convenience of management must plainly be regarded as all-important. The provision of 1000-bed units need not be given undue weight if regional control of function *is accepted as an alternative. It is the less drastic* alternative, and it leaves the way open for a subsequent merger of groups if such proves desirable. It does not involve, at the outset, disturbance of personnel; and it does not involve all the friction that is bound to follow if chairmen and medical superintendents, house-governors and matrons, drawn from different hospitals, have to be thrown together in a single set-up and the one subordinated to the other.

The new service establishes conditions in which it is reasonable to hope that, given time, all will work easily together; but time is essential, and it would be disastrous to suppose that a stroke of the pen is all that is necessary to realise what must often be a slow process of approximation and unification. The circumstances will vary widely, and unification which in some cases can be achieved from the outset may in others require years before fusion is possible.

Hence the regional board, in pursuing its object of grouping hospitals into units, should proceed by persuasion rather than by coercion. It should be content to start by providing a management committee for smaller groups or even for each of the existing hospitals —rather than for what might prove to be an artificial unit based on a paper plan. The powers and duties of the regional boards in delegation to local management *committees should be drafted accordingly.* Against a background of regional control of finance, and regional participation in the appointment of personnel, both of the management committee and of the medical staff, there need be no fear that the Minister will lack the powers needed to bring about a complete fusion wherever such is proved, by experience of working the scheme, to be in the general interest.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JULY 27

Notifications.—Smallpox, 0; scarlet fever, 994; whooping-cough, 2468; diphtheria, 308; paratyphoid, 14; typhoid, 8; measles (excluding rubella), 3741; pneumonia (primary or influenzal), 363; cerebro-spinal fever, 41; poliomyelitis, 18; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 90; puerperal pyrexia, 145; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on July 24 was 1155. During the previous week the following cases were admitted: scarlet fever, 48; diphtheria, 29; measles, 86; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 4 (0) from measles, 8 (1) from whooping-cough, 2 (0) from diphtheria, 38 (1) from diarrhœa and enteritis under two years, and 1 (0) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 285 (corresponding to a rate of 31 per thousand total births), including 37 in London.

Sir Comyns Berkeley from his estate of £123,000 has made a residual bequest to Gonville and Caius College, Cambridge, *for the provision of medical fellowships.*

Public Health

Milk in Schools

FROM Aug. 6 free milk will be provided for children grant-aided schools, including special schools, and lso for full-time students under the age of 18 attending rant-aided courses of further education. The Minister f Food has asked distributors to return, at the beginning f the autumn term, to the use of $^1/_3$-pint bottles supplied ith straws, and though it may not be possible to rovide enough bottles and straws at the outset, measures re being taken to overcome the shortage. The amount f $^1/_3$ pint daily for each child will be increased as soon as nilk-production allows. At boarding and special schools or delicate children the amount will be $^2/_3$ pint daily. The milk will be sold by the dairyman to the local education authority, and will be charged to the Ministry of Food. To avoid waste, suppliers are to be told of day-to-day variations in quantities required; and when, despite careful ordering, there is a surplus, it is to be given to children who seem likely to benefit from it. "All concerned will recognise that school milk is provided for the children; it may not be disposed of to anyone but school-children without express instructions from the Food Office." Milk may be provided during holidays and at weekends if it is drunk at school or at a centre approved by the local education authority. Milk may also be carried home to sick children. The Ministry of Food will authorise a change of dairyman if the medical officer of health withdraws his approval of the source and quality of milk supplied, or where a change is necessary to get heat-treated or T.T. milk.

Welfare Foods

The Government has decided to continue the supply of welfare foods, with some slight modifications, as a supplement to family allowances, though the foods will not be restricted to those who are entitled to allowances. The Minister of Health asks welfare authorities to encourage a larger take-up. The foods offered remain the same—milk (either liquid, or national dried milk), orange juice, and cod-liver oil, and vitamin A and D tablets for pregnant women. Since July 21 fresh milk has been supplied at 1½*d.* a pint instead of 2*d.*, and dried milk at 10½*d.* a tin instead of 1*s.* 2*d.* Cod-liver oil, and vitamin A and D tablets, are provided free; and free milk and orange juice are allowed automatically to people receiving public assistance. Applications for free supplies from others will be decided by the Assistance Board. When an applicant for free milk and orange juice says that her husband is receiving public assistance the local food office is to accept her statement and provide the foods at once; and the public-assistance officer will then be asked to confirm the facts.

The Government are anxious to ensure that the welfare foods are eaten by those for whom they are intended. When foods go into the common larder it may be by thoughtlessness as much as by intentional misuse of them. The welfare authorities are asked to do all they can to secure the proper use of foods, through the educational work of medical officers at welfare centres, and of midwives, district nurses, and health visitors. Any known cases of misapplication of foods should be reported to the Ministry.

Outbreak of Typhoid Fever

At Aberystwyth by Tuesday 58 patients had been admitted to hospital suspected of typhoid, and the diagnosis had been confirmed in 31. These figures do not include visitors who have become ill since returning home, and the circumstances suggest that an appreciable number of these, widely scattered over the country, will be notified during the coming week.

The conjectured date of infection of the initial cases in the outbreak was July 11. The first patient was admitted to hospital on the 27th. The food histories of the first 22 patients implicated ice-cream and exonerated other aliments. The manufacturer and vendor of the ice-cream gives a history of typhoid fever in 1938 and his Widal titre (Vi 1/80) strongly suggests that he is still excreting *Bact. typhosum.* This source of infection was stopped on July 29; further cases from it may therefore occur until the middle of August.

In England Now

A Running Commentary by Peripatetic Correspondents

IT would be a good thing if members of the medical staff or governing body of a hospital were occasionally to attend as outpatients or be admitted as inpatients—of course incognito. Only in this way can they gain a real insight into the working of the admission procedures and realise their shortcomings. Sometimes they might have a pleasant surprise. There is an authentic story told of a well-known millionaire who, wandering alone round the outpatient department of a hospital in which he was interested, asked the lady in charge of the patients' canteen how much he would have to pay for a bun. She replied compassionately: "A penny each, but if you can't afford a penny you can have it for nothing."

Outpatients usually have to wait long hours before being seen by a member of the staff, for the appointment system has not yet been generally adopted and is often difficult to arrange. And patients still do not always receive that politeness and consideration to which the sick person is entitled. So many junior officials, "drest in a little brief authority," exercise that authority in a Hitlerian manner. The same criticism, mutatis mutandis, applies to the reception of inpatients at some of the larger hospitals. I speak feelingly because recently a friend of mine, suffering from pneumonia, had to be admitted to the wards of a well-known hospital. On arrival at the hospital the patient was made to wait for a considerable time in a dark, cramped, and very ill-furnished and forbidding room without a word of comfort being offered. The apparent neglect to deal promptly and kindly with one who was gravely ill made a very bad impression on this patient. Surely every hospital should have proper rooms and suitable persons to receive and welcome the arriving patient. It is unfortunate that the human and humane touch is so often lacking at the hospital entrance. Just compare this with the account given me by one who has recently visited one of the modern Swedish hospitals:

> "On entering the hospital there is an information bureau where all directions are given and questions answered. The reception hall is superb. Patients' and visitors' hats and coats are taken on entering and a ticket given. A delightful fountain in the centre of the hall is intended to give an inviting impression, and there is a lunch counter where an all-day service is provided."

It is perhaps too much to hope that this method of reception will be equalled in this country for some years to come; but something should be done, and done quickly, to improve the method of reception of patients. Why not have a few trained and kindly receptionists to welcome patients and conduct them to their destination. Absurd and impracticable? Of course, but most necessities of today were impracticable yesterday.

* * *

If you, gentle reader, have ever visited cases in a smallpox hospital, and then twelve days after the last visit, when staying with relatives, developed a P.U.O. with backache, you will understand my mental anguish.

The first reaction was to search anxiously for a harmless cause. A sore throat, neck rigidity, abdominal pain, or dysuria were all wished for. Never could a rusty sputum or dyspnœa be so desired. Acute leukæmia would have been welcome.

Their absence caused a feeling of doom. A Service vaccination would give me some protection, but a *doubtful take* on my wife would leave her scarred and pitted. An unhappy fate for both of us. Perhaps I would even be thought to blame, and would have to hide the mirror for the remainder of our lives.

The death of the unvaccinated host and hostess, their daughter and small child, seemed a small cloud in the sky compared to the reproaches my feverish brain saw so distinctly in the future from their bereaved. Was it my duty to attend the cremation?

The fourteenth day was spent in papule-hunting. The normal soles and palms are made of incipient papules for those who have the eyes to see. Each inspection made my near ones' doom seem closer. All was however to end well; what was thought to be the mere catch in the throat of a potential murderer developed, aided by the doctor's and patient's prayers, into a pharyngitis, responsive to sulphathiazole.

The Minister of Health is abolishing compulsory vaccination; but even if he makes it illegal, I shall procure black-market lymph with the utmost regularity.

* * *

One has only to glance at any newspaper headlines of recent weeks to realise that there are many battles in progress in the name of nationalism—battles of words only, fortunately, although occasional armed clashes have taken place. It all seems rather ridiculous when one knows from experience that individuals of diverse nationality can live together peaceably—as in America, for instance, or, on a smaller scale, in this hospital, with its staff of English, African (West, East, and South), Arab, German, and Italian, and with Polish, French, and Indian patients (among others), in addition to those already mentioned. No conflicts occur, because all have a common object, aside from selfish interests, which is the welfare of the patients. People are easily inflamed by real or imaginary injustices to their persons or beliefs. Would not people be better off if their minds were not constantly inflamed by the stressing in newspapers of crimes done in the name of nationalism? This trait is very pronounced in newspapers in the English language in India and the Middle East. A newspaper editor should have a sense of responsibility to the public; but ideals of duty seem to have disappeared with the end of the war. Very odd.

* * *

I quite appreciated the physiology and significance of binocular vision when I was lectured on it. But nobody ever told me about binaural hearing. Its existence has been brought home to me by a violent otitis externa. With my left external auditory meatus bunged up (sorry, occluded) either by the torrential discharge or by the combative medicaments, I have found the world a changed place. Pitch and timbre are strangely altered qualities. The Beethoven Violin Concerto isn't Beethoven any more—except perhaps a very old recording on an even older gramophone. Voices can no longer be identified and are differentiated into two categories only—the soft and the inaudible. The tendency to turn the good ear towards any source of sound extends itself, when one is not listening to anything in particular, to an almost irresistible impulse to maintain a slow, continual rotation like those big batteries of tuba-shaped hoojahs used by the Ack-Ack listening posts.

I have always been quite smug at being able to shave without a mirror if necessary. So I was sadly shaken when I found myself carving slices off my left cheek. Evidently I have been shaving by ear all these years. Localisation is a great problem, particularly where conversation is concerned. At best I would have time to look round and see whose lips were moving. At worst I would be too late and would have to sit among unmoving faces, afraid to ask who had spoken, wondering indeed if I were at last hallucinating. The deaf are notoriously suspicious and full of ideas of reference. And I am in the throes of a rather unique psychiatric entity—a unilateral paranoia. Stand by my right and you are my friend. Move round to the other side and you become sinister in both senses of the word—a plotter, a schemer, one of the gang, mouthing signs and whispering instructions to bring about my ruin. Only one boon has this trouble brought me. If I sleep with my good ear next to my pillow I get a full night's sleep. The wardmaids can kick buckets up and down the corridors at any hour of the dawn for all I care.

* * *

Arthur Hugh Clough's *Decalogue* must be the most biting satire on humanity's interpretation of the Ten Commandments that has ever been written. But medical authors persist in quoting the sixth couplet, "Thou shalt not kill: but need'st not strive officiously to keep alive," as a warrant for relaxing attempts to prolong life in distressing and incurable disease. The latest offender is the author of an otherwise admirable lecture on the Art of Medicine in Relation to the Progress of Thought. It is requested, as we say in the Army, that future authors will not use this particular quotation until they have read, marked, learned, and inwardly digested the spirit of the poem.

Letters to the Editor

HOMOLOGOUS SERUM HEPATITIS

SIR,—To the many causes of jaundice is now added *acute or subacute hepatic necrosis* due to parenteral therapy, by toxic agents in needles, syringes, homologous serum, and plasma. Tracing cases due to this cause will be easier when practitioners are alert to its consideration in all cases of jaundice, and take a history of the case with parenteral therapy in mind, covering a period of 50–150 days before the first symptoms of an illness which includes jaundice.

This aspect emphasises one of the valuable points in the letter from Dr. W. H. McMenemey in your issue of June 29—i.e., the value of notification of jaundice of doubtful origin, including infective hepatitis. Notification should be a useful supplement to the statistical surveys of the sequelæ of parenteral therapy which may be made. That the results of such surveys may sho appreciable mortality is suggested by necropsies Preston on six such cases.

The six patients left hospital normally convalesce from their primary disability. Four were readmitte many weeks later and a few days before death. Tw died at home and were reported to H.M. coroner primaril because of accidental injuries which caused their previou admission to hospital.

Unless the mortality of this disorder is unexpectedl high, these six deaths may indicate 200–300 non-fat cases in the same area, of which there is no record.

Case	Year	Sex	Age	Reason for giving plasma	"Incubation" period (days)	Final illne (day
1	1942	M	22	Partial gastrectomy, peptic ulcer	69	4
2	1944	F	33	Shock after manual removal of placenta	125	2
3	1945	M	46	Partial gastrectomy, peptic ulcer	64	20
4	1945	M	73	Traumatic shock, multiple fractures	67	26
5	1946	M	42	Partial gastrectomy, peptic ulcer	45	22
6	1946	F	35	Traumatic shock, multiple fractures	76	20

Only the last 3 cases came to inquests. The grou again shows that, as in epidemic hepatitis, the illness ca be very short. In the same period of time 7 necropsie have been done on cases of epidemic hepatitis, in further fatal cases of which disease necropsy was refuse

Preston.

F. B. SMITH.

OUR HOUSES

SIR,—I should like to say "thank you" for you leader of July 27, entitled The Cult of the Obsolet which was sadly needed.

It is true to say that in the matter of building con struction, and domestic and sanitary fittings, this countr is a good fifteen years behind the times, and shows n signs of catching up. We also appear to be complete incapable of creating beauty. I make these statement as a result of two years in France, Belgium, Holland, an Germany with the R.A.M.C. The last three countri are a long way ahead of us in housing, especially Hollan

A typical pre-war Dutch house is finely proportioned with large and long windows, and, more likely than not a balcony. It is pleasant to look at, colourful, yet no vulgar. Dutch architects can do what ours cannot—they can create beauty. The inside of the house has al been very much the architect's concern. Here are well proportioned and well-lit rooms, fitted cupboards, and modern kitchen and bathroom. An inviting stairca curves up from the spacious, square-shaped hall. Ther are always central heating and pipe-insulation, and nearly always cavity walls.

Perhaps the difference between our approach and their is best illustrated by taking a small point—the wa washbasins and baths are fitted in Holland and Germany

In this country, as you know, two holes are knocked in the wall for the hot and cold water, from which two serpentine pipes writhe up to the respective taps. The waste-pipe with its out-of-date U trap looks like a switchback. If we wish to hide this, we must go to the expense of a pedestal basin—a thing unknown on the Continent. Contrast this with the position in even the cheapest houses in the above two countries. Here the hot and cold come through the wall and end in two little chromium-plated unions, each with a tiny stopcock of its own. From these, two plated or copper pipes run up in a straight line to the taps. A modern chromium or porcelain bag-trap replaces the unsightly U. The whole effect is neat and pleasing; there is no need to cover it up. This design is almost unused here; even our most modern London hotels cannot show plumbing as neat as a German workman's pre-war house. Baths in Holland and Germany are never fitted, even in hurriedly built military hospitals, without being built in, usually with a tiled surround. There is *always* some sort of a shower. This usually takes the form of a simple mixing faucet fixed in the middle of the far side of the bath. From the upper side of this a flexible pipe runs with a rose on the end which is hooked to the wall when not in use. It is simple, mass-produced, and effective, and costs a few shillings.

The reason for our backwardness lies, I think, in two national failings.

1. We will *not* bother ourselves over what we think are unimportant details. We cannot grasp that the way a basin is fitted or pipes insulated *is* important.

2. We are still afraid of beauty. Those who live in beautiful houses with colourful rooms, well-designed furniture, and gay pictures are still regarded as a little odd. For a long time they were even thought to be not respectable.

So we continue to put up with shoddy plumbing, inefficient heating, and no insulation. We also fill our houses with unbecoming furniture, dull pictures, nightmare lampshades, fantastically ugly ornaments, and the rest of the trash to be seen in furniture stores today.

Are we afraid of being thought "different"? Poor fools that we are—we are already "different" by fifteen years of progress from the rest of Europe!

London, S.W.7. PETER NASH.

ANOXIA AND RENAL FUNCTION

SIR,—In his letter of March 9, Professor McCance questioned our inclusion of the renal failure associated with alkalosis within what we have called the syndrome of "renal anoxia." He criticised our contention that there may be "alterations in renal hæmodynamics . . . and a redistribution of blood-flow through the kidney" in such conditions and finds it "difficult anatomically to visualise such changes in the mammalian kidney, in which the tubules have no separate blood-supply." He also expressed the view that it is not yet time to find a single explanation for "this interesting and widespread syndrome" and that it would be better for the present to "concentrate on the collection of facts." May we crave a little more of your space to restate our case?

In our original paper on renal anoxia[1] we pointed out that in many otherwise differing conditions—for example, blackwater fever, surgical shock, and cholera—there may develop a common picture of renal failure usually accompanied by oliguria or anuria. We suggested the collection of such renal syndromes within the term "renal anoxia" (as an alternative to the term "tubulovascular syndrome" previously suggested by one of us[2]) because we thought that the kidney changes involved were produced by lack of oxygen, resulting in most instances from changes in the renal blood-flow. We believe (1) that in these conditions there is a reduction in the total blood-flow through the kidney, (2) that this is accompanied by a redistribution of the blood-flow within its component parts, and (3) that in consequence the cortex of the kidney suffers from anæmia and therefore from anoxia, which may be either relative or absolute.

1. *Reduction in Total Renal Blood-flow.*—We emphasised in our paper that a "diminished renal circulation is probably a constant factor" in the production of the syndrome. In this respect we have the support of Cournand[3] and Lauson et al.,[4] who investigated, by means of renal clearances, the renal blood-flow in cases of non-crushing surgical shock, and deduced from their experiments that there occurred in these conditions a reduction of renal blood-flow much greater than could be accounted for by any change in hydrostatic blood-pressure. Lauson et al. sum up the position as follows: "This investigation confirms the hypothesis that the urinary findings in shock, i.e., oliguria or anuria and loss or impairment of concentrating power" (the syndrome of renal anoxia) "are the result of decreased circulation through the kidney." Such reduction in total blood-flow through the kidney has been postulated by other writers. For example, Darmady and his co-workers[5] suggest that renal failure in traumatic shock may arise from anoxia resulting from vascular spasm or from hypotension, or both. Trueta[6] attributes traumatic anuria to reduction in the blood-supply of the cortex "due to overstimulation of vascular nerves," and also suggests that this diminution of renal flow may be brought about by arterial spasm. Scarff and Keele[7] found that a general tubular lesion histologically resembling that seen in crush injury could be produced in rabbits by total obstruction of the renal flow for an hour or more, and in a series of experiments designed to study the action on the kidneys of circulating blood pigments, Yuile and others[8] noted that a non-specific "functional abnormality of individual nephrons," indicated histologically by lesions of the tubules, could be produced in rabbits either by renal ischæmia or chemical poisoning.

What has been said provides good evidence that there is a reduction of total renal flow in traumatic anuria (which we consider an example of the wider syndrome of renal anoxia) and that experimental interference with renal blood-flow in rabbits can produce renal changes similar to those found in man.

2. *Redistribution of Blood-flow within the Kidney.*—We admit that such redistribution has not yet been clearly demonstrated in patients suffering from the renal syndrome under discussion. Our present experimental techniques are probably not sufficiently delicate to show this in the living patient. Nevertheless, the usual histological picture seen at necropsy is consistent with the view that the cortical blood-flow has been mainly diverted from the cortex to the medulla.[9] The pale cortex with relatively anæmic glomeruli and the engorged medullary vessels often described in these conditions,[2,10] together with the type of degenerative lesions seen in the tubules, support this contention. Moreover, the changes observed in renal clearances of diodone and inulin in dogs rendered hypotensive by bleeding led Corcoran and Page[11] to the view that under these circumstances the blood-flow was probably distributed *irregularly* through the renal vascular bed.

We believe that the evidence outlined above favours our view that, in the renal anoxia syndrome, there occurs some redistribution of the blood-flow within the kidney. The mechanism by which such redistribution is brought about is a more controversial matter. There is evidence to suggest however that the blood-flow to portions of the renal cortex may differ to some extent from that of the rest of the cortex, both anatomically and functionally. The information available regarding the minutiæ of the renal blood-flow is very largely based on the study of fixed tissue and it is unlikely that the dynamics of the renal circulation will be elucidated until better techniques enable us to study the living functioning organ, in much the same way, for example, as Knisely[12] examined the splenic flow. Nevertheless, there are suggestive indications in the published work. Bowman's dogmatic teaching that all blood must traverse the glomeruli to reach

---

1. Maegraith, B. G., Havard, R. E., Parsons, D. S. *Lancet*, 1945, ii, 293.
2. Maegraith, B. G. *Trans. R. Soc. trop. Med. Hyg.* 1944, 38, 1.
3. Cournand, A., et al. *Surgery. Chicago*, 1943, 13, 964.
4. Lauson, H. D., Bradley, S. E., Cournand, A., Andrews, V. V. *J. clin. Invest.* 1944, 23, 381.
5. Darmady, E. M., Siddons, A. H. M., Corson, T. C., Langton, C. D., Vitek, Z., Badenoch, A. W., Scott, J. C. *Lancet*, 1944, ii, 809.
6. Trueta, J. *Ibid.* 1945, ii, 415.
7. Scarff, R. W., Keele, C. A. *Brit. J. exp. Path.* 1943, 24, 147.
8. Yuile, C. L., Gold, M. A., Hinds, E. G. *J. exp. Med.* 1945, 82, 361.
9. Maegraith, B. G., Findlay, G. M. *Lancet*, 1944, ii, 403.
10. Witts, L. J. *Ibid*, 1929, i, 1279.
11. Corcoran, A. C., Page, I. H. *J. exp. Med.* 1943, 78, 205.
12. Knisely, M. H. *Proc. Soc. exp. Biol., N.Y.* 1934, 32, 212.

the tubules and so be distributed from the glomerular efferent vessels has been often challenged—e.g., by Ludwig and Isaacs, both of whom claimed that non-glomerular vascular twigs, arising from the interlobular arteries or from the glomerular afferents, also supply the tubules. The presence of these vessels has recently been confirmed in animals, but their direct functional importance in man has not been settled. Other small vessels arising from the glomerular afferent arterioles and running either to the stellate plexus or directly into the medulla (true arteriæ rectæ) have been described in rabbits.[13] In this connexion it has been shown that hypertension in rabbits resulting from constriction of the renal artery can be abolished by the establishment of collateral circulation developing from the perirenal tissue. Such circulation could be established only through non-glomerular vessels connecting the stellate plexus with the main renal circulation. A more important non-glomerular supply to the tubules has been described by Spanner,[14] who demonstrated arteriovenous anastomoses in the human renal pelvis, cortex, and subcapsular plexus. According to Smith [15] these "anastomoses in the pelvis are so connected as to shunt blood from the interlobular arteries directly into the corresponding veins . . . they afford a mechanism for the direct perfusion of the tubules at a time when glomerular circulation is largely arrested." They may also form a mechanism for shunting blood across the medulla, so by-passing the cortex.

These and similar observations, though perhaps not individually convincing, collectively provide evidence of a non-glomerular circulation in the renal cortex. There thus exists the possibility of differential adjustments of the flow within the kidney, either through specialised vascular channels, such as those referred to above, or as the result of active variation in the calibre of the vessels concerned.

The manner in which such variations in renal flow can be initiated and sustained has not yet been determined. Lauson and colleagues [4] interpreted their observations in traumatic shock in terms of increased renal vascular resistance. As mentioned above, Darmady et al.[5] and Trueta [6] have also suggested that vascular spasm may be concerned in the general reduction of renal flow in such conditions. Trueta believes that such spasm may arise reflexly from overstimulation of the renal vasoconstrictor nerves, with which the kidney is richly supplied.[15] Darmady et al. have also pointed out that reduction in renal flow in traumatic shock may result in part from hypotension within the organ. Such hypotension is not always present in clinical states in which the renal anoxia syndrome may develop, so that it is more likely that some active vascular change, such as described above, occurs in the kidney in these conditions.

3. *Anæmia and Anoxia of Renal Cortex.*—The evidence in favour of the view that the functional and pathological changes accompanying the renal anoxia syndrome are related mainly to anoxia of the cortex has been set out in detail elsewhere.[1,2,9] In the clinical development of any individual case of the renal anoxia syndrome, the redistribution of the intrarenal flow will determine the onset or otherwise of anuria (i.e., the failure of glomerular flow) and the degree of cortical anoxia will determine the degree and permanency or otherwise of the interference with tubular function. In most examples of the syndrome we believe the changes in renal flow are initiated by extrarenal conditions—for example, the general peripheral collapse seen in shock and blackwater fever. Here the renal functional failure supervenes on vascular failure. In some cases, however, the process may be reversed and changes developing within the kidney may reflexly initiate alterations in renal flow.[13] The renal failure in alkalosis is a case in point. In the early stages we picture [16] an increase in glomerular flow unaccompanied by corresponding reduction in total renal flow, and brought about possibly by constriction of glomerular efferent vessels. As the alkalosis develops the total renal flow is reduced, and in this stage the tubules may suffer from shortage of oxygen which is not so much absolute as relative. If, for instance, during the excretion of excess alkali, the demand for oxygen by the tubular epithelium is increased at a time when the blood-supply is being reduced, a state of relative anoxia will arise, resulting in tubular inefficiency and thus explaining the noxious effects of alkalosis on tubular function.

The development of anuria (as distinct from renal *tubular* failure) in alkalosis is more difficult to explain, as Professor McCance points out. We believe that anuria, in all forms of the renal anoxia syndrome, results primarily from failure of glomerular flow. Such failure in the case of alkalosis may possibly arise as follows: As the normal blood-supply of the tubules is cut down (by constriction of either non-glomerular arterioles or the efferent glomerular vessels, or both) the condition of anoxia in the tubules worsens. The result of this is to bring into action such mechanisms as those described by Spanner for the direct perfusion of the tubules by the opening up of arteriovenous anastomoses. Such opening up of anastomoses might itself, by a process of over-compensation, precipitate anuria by diverting blood from the already restricted glomerular circulation.

CONCLUSION

We are sensible of the deficiencies in the evidence we have presented here and elsewhere in our attempt to find a common factor in such a widespread and complicated syndrome as that of renal anoxia. We agree with Professor McCance that the further collection of facts is necessary, particularly with regard to tests of kidney function in clinical examples of the syndrome. We believe, however, that our attempted simplification of the problem will make such factual collection easier and give some direction to it.

BRIAN MAEGRAITH.
R. E. HAVARD.

Department of Tropical Medicine, Liverpool.

NEW WORDS ABOUT OLD AGE

SIR,—Diseases of old age and the care of the aged have recently become subjects of increased interest to the medical profession. There is, however, a certain vagueness as to the meaning of some of the words used in this connexion. For example, the author of a book on medical aspects of growing old has confused "gerontology" (the science of old age) with "geriatrics" (the care of the aged) in his very first sentence. Both these terms originated in America. The former has been popularised by the writings of Stieglitz; the latter coined by Nascher in 1909, has spread owing to its propagation by Thewlis. Of course, the parent of both words was used in 1724 when Sir John Floyer published his *Medicina Gerocomia.* "Gerocomy" (defined in the *Shorter Oxford English Dictionary* as "the science of the treatment of the aged") seems too good a term to be abandoned and might be employed technically for those aspects of the care of the aged which are not strictly medical, such as accommodation, clothing, and other social or administrative activities. In this way a gap would be filled in the nomenclature of old age.

Purley, Surrey. TREVOR H. HOWELL.

DESOXYCORTONE AND ARTHRITIS

SIR,—I must apologise to Professor Selye (June 22, p. 942) for having omitted to mention the weights of the rats used in my experiments. As stated in my article, however, his corresponding experiment was repeated "in detail," which was intended to indicate that animals of the same weight *(30–50 g.)* were used. *It is explicitly* stated in my paper that "subcutaneous injections were started in the selected rats." Professor Selye claims that my results do not lend themselves particularly well to statistical analysis. The primary object of my experiments was to determine the relation of desoxycortone to arthritis, and for this purpose two groups of 5 rats, one injected and the other non-injected, were used. The incidence of arthritis in Professor Selye's corresponding experiment was 3 out of 8 (more than 1 out of 3). *If, then, 1 : 3 is the chance of* procuring arthritis, there are 211 out of 243 chances that at least 1 out of 5 rats will get it, and only 32 out of 243 chances that none will get it. Hence the incidence of arthritis in my experiment (0 out of 5) is suggestive compared

---

13. Maegraith, B. G., McLean, F.L. *Brit. J. exp. Path.* 1942, 23, 239.
14. Spanner, R. *Verh. anat. Ges. Jena,* 1938, 45, 81.
15. Smith, H. W. *Harvey Lect.* 1939–40, 35, 166.
16. Army Malaria Research Unit, *Lancet,* 1945, ii, 701.

with that in Professor Selye's experiment. The protein content of the diet used in my experiments was approximately 20%.

Dr. Denys Jennings (July 20, p. 101) is, I feel, confusing the issue by a misapplication of statistical procedure to a perfectly valid statistical analysis. I quite agree that the adrenalectomy +D.C.A. group of Selye's experiment I, when arranged in a 2 × 2 contingency table, at first appears to be significant. But Dr. Jennings states that the numbers of animals used in Selye's xperiments are small. Because they are small many of he expected or theoretical numbers obtained from he contingency tables are less than 5. Therefore the value of P determined from such a chi square test is open to doubt, for the tendency is for the test to make the esult appear more significant than it really is (D. Mainand: *Treatment of Clinical and Laboratory Data*, 1938, p. 91). The obviation of this difficulty is by grouping of results, the procedure which I adopted. Apart from his fact, however, the data of experiment II cannot be gnored, and should be considered in conjunction with those of experiment I.

Dr. Jennings claims that the results of experiment I are significant even when a more accurate mathematical technique is employed. If the first two groups of experiment I are combined as in the following contingency table—

	Arthritis	*No arthritis*	*Total*
D.C.A.+adrenalectomy and D.C.A.+thyroidectomy	8	12	20
D.C.A. only	1	7	8
Total	9	19	28

then the method mentioned by Kendall (*Advanced Theory of Statistics*, 1943, vol. I, p. 304) can be applied. This is an exact method not depending on the chi square test, and shows that, given the marginal totals of 9, 19, 8, and 20 shown in the table, there would be a probability of 0·17 that the incidence of arthritis among the 8 "D.C.A. only" rats should have been 1 or 0. The conclusion suggested is that "there is nothing here to reject the hypothesis that adrenalectomy and thyroidectomy exert no influence on the incidence of arthritis." This conclusion is greatly reinforced by the results Professor Selye gives for experiment II. I am also dubious of the criticism Dr. Jennings makes of my experiments on biological grounds. The rats I used were of the Wistar strain, which are probably the same as those used by Professor Seyle.

I must thank Mr. D. G. Champernowne, of the Institute of Statistics, Oxford, for his help in the statistics of the original paper and of this communication.

Department of Human Anatomy,
University Museum, Oxford.

R. G. HARRISON.

NURSING

SIR,—The proposed health services will call for thousands upon thousands of nurses, and the question which perturbs many of us is, can we get these men and women by offering large salaries and good conditions? I contend that of all the occupations, that of nursing calls for "something" quite unrelated to wages and conditions; Mr. Cohen's inquiries endorse this fact. Unfortunately the evidence is that the more rapidly we move to the practice of so-called equalitarianism, the more materialistic and the less spiritual or vocational we get. With good conditions and wages we shall get all the lay staff needed to run the hospitals, but it is most doubtful if we shall get half the nurses needed. Of course many more women will be attracted to the profession, but of the entrants too many will give up before completing their training, through finding out that they just can't stick it, or through marriage. Before and between the wars there was no particular difficulty in staffing hospitals and municipal institutions, even though conditions and wages were awful, because there were many more people with the vocational and spiritual content; today this spirit is as dead as the dodo and we are all looking for and advocating more wages and less work; and nursing is hard and often disagreeable work.

St. Osyth.

R. E. CLARKE.

AVOIDABLE CANCER

SIR,—In connexion with your annotation of July 27 the following facts may be of interest to your readers. (1) Mineral oil can be, and is being, produced which is non-carcinogenic. (2) A non-carcinogenic mule spindle mineral oil known commercially as white oil is on the market. (3) Exhaustive tests on the skin of mice indicate that it is no more likely to cause tumours in mice than olive or sperm oil. (4) Coal as such is not carcinogenic, but some of its products will be if it is destructibly distilled above a certain temperature. (5) So far as is known, any organic matter will yield carcinogenic products if destructibly distilled at a high enough temperature. It cannot, therefore, be considered odd that the products of coal and petrol which have lain under the earth for centuries should have carcinogenic properties.

Southwick, Sussex.

J. M. TWORT.

UREA-FORMALDEHYDE RESINS IN ORTHOPÆDIC SURGERY

SIR,—When used in setting fractures plaster-of-paris suffers from many defects, including impermeability to X rays, lack of resistance to water, and an inherent brittleness. Urea-formaldehyde synthetic resin adhesive has none of these failings, but much remains to be done to make it a practical contribution to orthopædic surgery. Preliminary trials have been carried out as described here, and it is hoped that from these data further development will be possible.

The urea-formaldehyde resin 'Casco-Resin P' was selected because it has a viscosity suitable for impregnation and a low free-formaldehyde value, and is fairly highly condensed, thus requiring relatively low acidity to harden it at room temperature. The solids content is 60%. Urea-formaldehyde resins may be hardened at room temperature by the use of acid or acid-developing catalysts or hardeners; but they are fundamentally thermo-setting, and full condensation is best obtained by the application of heat, either by direct conduction, infra-red radiation, or high-frequency induction.

The first experiment was the preparation of a bandage for a supposedly fractured wrist. The wrist was treated with an anti-dermatitis cream, and two or three turns of a 2-in. white open-wove bandage were put round it. Another 2-in. bandage was immersed in a beaker containing casco-resin P 100 parts by weight and hardener 'M-1' 10 parts by weight. The bandage was unrolled in the liquid and drawn out between two glass rods to remove the surplus resin. It was next wound on the wrist and baked in front of an electric fire for half an hour, at the end of which the outer layers of the bandage had hardened, thus giving support and rigidity. Next morning the bandage was hard and rigid throughout and, though only $^1/_8$ in. thick, gave as firm support as a much thicker and more cumbersome plaster-of-paris bandage.

Several of these bandages were prepared, and in some cases the "patients" took hot baths, immersing the bandage without any special precautions, and there was no softening or reduction in strength. The bandages were easily cut off with shears, and there was no sign of skin irritation or dermatitis.

Casco-resin P requires an acid medium in which to harden and become rigid, a pH lower than 5·5 being usually needed. This acidity tended to destroy the cellulose of the cotton bandage at the edges, where thin layers became very brittle. To overcome this, experiments were carried out with thin flannel bandages, and the protein nature of the wool was much more resistant to acid. A notable feature of these bandages was their resilience, coupled with strength and rigidity.

The results of this work were shown to a doctor, who suggested the production of light-weight rigid jackets or spinal ailments.

One of his patients had collapse of the spine due to a malignant growth and had recently been fitted with a support made of steel and leather. This support was rigid, heavy, and in no way moulded to the patient, and the discomfort of wearing such a support was accentuated by scars of operations for kidney trouble. It was decided to mould a back support to the shape of the patient, leaving slight hollows the tubules and so be distributed from the glomerular efferent vessels has been often challenged—e.g., by Ludwig and Isaacs, both of whom claimed that non-glomerular vascular twigs, arising from the interlobular arteries or from the glomerular afferents, also supply the tubules. The presence of these vessels has recently been confirmed in animals, but their direct functional importance in man has not been settled. Other small vessels arising from the glomerular afferent arterioles and running either to the stellate plexus or directly into the medulla (true arteriæ rectæ) have been described in rabbits.[13] In this connexion it has been shown that hypertension in rabbits resulting from constriction of the renal artery can be abolished by the establishment of collateral circulation developing from the perirenal tissue. Such circulation could be established only through non-glomerular vessels connecting the stellate plexus with the main renal circulation. A more important non-glomerular supply to the tubules has been described by Spanner,[14] who demonstrated arteriovenous anastomoses in the human renal pelvis, cortex, and subcapsular plexus. According to Smith [15] these "anastomoses in the pelvis are so connected as to shunt blood from the interlobular arteries directly into the corresponding veins . . . they afford a mechanism for the direct perfusion of the tubules at a time when glomerular circulation is largely arrested." They may also form a mechanism for shunting blood across the medulla, so by-passing the cortex.

These and similar observations, though perhaps not individually convincing, collectively provide evidence of a non-glomerular circulation in the renal cortex. There thus exists the possibility of differential adjustments of the flow within the kidney, either through specialised vascular channels, such as those referred to above, or as the result of active variation in the calibre of the vessels concerned.

The manner in which such variations in renal flow can be initiated and sustained has not yet been determined. Lauson and colleagues [4] interpreted their observations in traumatic shock in terms of increased renal vascular resistance. As mentioned above, Darmady et al.[5] and Trueta [6] have also suggested that vascular spasm may be concerned in the general reduction of renal flow in such conditions. Trueta believes that such spasm may arise reflexly from overstimulation of the renal vasoconstrictor nerves, with which the kidney is richly supplied.[15] Darmady et al. have also pointed out that reduction in renal flow in traumatic shock may result in part from hypotension within the organ. Such hypotension is not always present in clinical states in which the renal anoxia syndrome may develop, so that it is more likely that some active vascular change, such as described above, occurs in the kidney in these conditions.

3. *Anæmia and Anoxia of Renal Cortex.*—The evidence in favour of the view that the functional and pathological changes accompanying the renal anoxia syndrome are related mainly to anoxia of the cortex has been set out in detail elsewhere.[1 2 3] In the clinical development of any individual case of the renal anoxia syndrome, the redistribution of the intrarenal flow will determine the onset or otherwise of anuria (i.e., the failure of glomerular flow) and the degree of cortical anoxia will determine the degree and permanency or otherwise of the interference with tubular function. In most examples of the syndrome we believe the changes in renal flow are initiated by extrarenal conditions—for example, the general peripheral collapse seen in shock and blackwater fever. Here the renal functional failure supervenes on vascular failure. In some cases, however, the process may be reversed and changes developing within the kidney may reflexly initiate alterations in renal flow.[13] The renal failure in alkalosis is a case in point. In the early stages we picture [16] an increase in glomerular flow unaccompanied by corresponding reduction in total renal flow, and brought about possibly by constriction of glomerular efferent vessels. As the alkalosis develops the total renal flow is reduced, and in this stage the tubules may suffer from shortage of oxygen which is not so much absolute as relative. If, for instance, during the excretion of excess alkali, the demand for oxygen by the tubular epithelium is increased at a time when the blood-supply is being reduced, a state of relative anoxia will arise, resulting in tubular inefficiency and thus explaining the noxious effects of alkalosis on tubular function.

The development of anuria (as distinct from renal *tubular* failure) in alkalosis is more difficult to explain, as Professor McCance points out. We believe that anuria, in all forms of the renal anoxia syndrome, results primarily from failure of glomerular flow. Such failure in the case of alkalosis may possibly arise as follows: As the normal blood-supply of the tubules is cut down (by constriction of either non-glomerular arterioles or the efferent glomerular vessels, or both) the condition of anoxia in the tubules worsens. The result of this is to bring into action such mechanisms as those described by Spanner for the direct perfusion of the tubules by the opening up of arteriovenous anastomoses. Such opening up of anastomoses might itself, by a process of over-compensation, precipitate anuria by diverting blood from the already restricted glomerular circulation.

CONCLUSION

We are sensible of the deficiencies in the evidence we have presented here and elsewhere in our attempt to find a common factor in such a widespread and complicated syndrome as that of renal anoxia. We agree with Professor McCance that the further collection of facts is necessary, particularly with regard to tests of kidney function in clinical examples of the syndrome. We believe, however, that our attempted simplification of the problem will make such factual collection easier and give some direction to it.

BRIAN MAEGRAITH.
R. E. HAVARD.

Department of Tropical Medicine, Liverpool.

NEW WORDS ABOUT OLD AGE

SIR,—Diseases of old age and the care of the aged have recently become subjects of increased interest to the medical profession. There is, however, a certain vagueness as to the meaning of some of the words used in this connexion. For example, the author of a book on medical aspects of growing old has confused "gerontology" (the science of old age) with "geriatrics" (the care of the aged) in his very first sentence. Both these terms originated in America. The former has been popularised by the writings of Stieglitz; the latter, coined by Nascher in 1909, has spread owing to its propagation by Thewlis. Of course, the parent of both words was used in 1724 when Sir John Floyer published his *Medicina Gerocomia.* "Gerocomy" (defined in the *Shorter Oxford English Dictionary* as "the science of the treatment of the aged") seems too good a term to be abandoned and might be employed technically for those aspects of the care of the aged which are not strictly medical, such as accommodation, clothing, and other social or administrative activities. In this way a gap would be filled in the nomenclature of old age.

Purley, Surrey. TREVOR H. HOWELL.

DESOXYCORTONE AND ARTHRITIS

SIR,—I must apologise to Professor Selye (June 22, p. 942) for having omitted to mention the weights of the rats used in my experiments. As stated in my article, however, his corresponding experiment was repeated "in detail," which was intended to indicate that animals of the same weight (30–50 g.) were used. It is explicitly stated in my paper that "subcutaneous injections were started in the selected rats." Professor Selye claims that my results do not lend themselves particularly well to statistical analysis. The primary object of my experiments was to determine the relation of desoxycortone to arthritis, and for this purpose two groups of 5 rats, one injected and the other non-injected, were used. The incidence of arthritis in Professor Selye's corresponding experiment was 3 out of 8 (more than 1 out of 3). If, then, 1 : 3 is the chance of procuring arthritis, there are 211 out of 243 chances that at least 1 out of 5 rats will get it, and only 32 out of 243 chances that none will get it. Hence the incidence of arthritis in my experiment (0 out of 5) is suggestive compared

---

13. Maegraith, B. G., McLean, F.L. *Brit. J. exp. Path.* 1942, 23, 239.
14. Spanner, R. *Verh. anat. Ges. Jena,* 1938, 45, 81.
15. Smith, H. W. *Harvey Lect.* 1939–40, 35, 166.
16. Army Malaria Research Unit, *Lancet,* 1945, ii, 701.

with that in Professor Selye's experiment. The protein content of the diet used in my experiments was approximately 20%.

Dr. Denys Jennings (July 20, p. 101) is, I feel, confusing the issue by a misapplication of statistical procedure to a perfectly valid statistical analysis. I quite agree that the adrenalectomy + D.C.A. group of Selye's experiment I, when arranged in a 2 × 2 contingency table, at first appears to be significant. But Dr. Jennings states that the numbers of animals used in Selye's experiments are small. Because they are small many of the expected or theoretical numbers obtained from the contingency tables are less than 5. Therefore the value of P determined from such a chi square test is open to doubt, for the tendency is for the test to make the esult appear more significant than it really is (D. Main- and : *Treatment of Clinical and Laboratory Data*, 1938, p. 91). The obviation of this difficulty is by grouping of results, the procedure which I adopted. Apart from his fact, however, the data of experiment II cannot be gnored, and should be considered in conjunction with hose of experiment I.

Dr. Jennings claims that the results of experiment I are significant even when a more accurate mathematical echnique is employed. If the first two groups of experiment I are combined as in the following contingency able—

	Arthritis	*No arthritis*	*Total*
D.C.A. + adrenalectomy and D.C.A. + thyroidectomy	8	12	20
D.C.A. only	1	7	8
Total	9	19	28

then the method mentioned by Kendall (*Advanced Theory of Statistics*, 1943, vol. I, p. 304) can be applied. This is an exact method not depending on the chi square test, and shows that, given the marginal totals of 9, 19, 8, and 20 shown in the table, there would be a probability of 0·17 that the incidence of arthritis among the 8 "D.C.A. only" rats should have been 1 or 0. The conclusion suggested is that "there is nothing here to reject the hypothesis that adrenalectomy and thyroidectomy exert no influence on the incidence of arthritis." This conclusion is greatly reinforced by the results Professor Selye gives for experiment II. I am also dubious of the criticism Dr. Jennings makes of my experiments on biological grounds. The rats I used were of the Wistar strain, which are probably the same as those used by Professor Seyle.

I must thank Mr. D. G. Champernowne, of the Institute of Statistics, Oxford, for his help in the statistics of the original paper and of this communication.

Department of Human Anatomy,
University Museum, Oxford.

R. G. HARRISON.

NURSING

SIR,—The proposed health services will call for thousands upon thousands of nurses, and the question which perturbs many of us is, can we get these men and women by offering large salaries and good conditions? I contend that of all the occupations, that of nursing calls for "something" quite unrelated to wages and conditions; Mr. Cohen's inquiries endorse this fact. Unfortunately the evidence is that the more rapidly we move to the practice of so-called equalitarianism, the more materialistic and the less spiritual or vocational we get. With good conditions and wages we shall get all the lay staff needed to run the hospitals, but it is most doubtful if we shall get half the nurses needed. Of course many more women will be attracted to the profession, but of the entrants too many will give up before completing their training, through finding out that they just can't stick it, or through marriage. Before and between the wars there was no particular difficulty in staffing hospitals and municipal institutions, even though conditions and wages were awful, because there were many more people with the vocational and spiritual content; today this spirit is as dead as the dodo and we are all looking for and advocating more wages and less work; and nursing is hard and often disagreeable work.

St. Osyth.

R. E. CLARKE.

AVOIDABLE CANCER

SIR,—In connexion with your annotation of July 27 the following facts may be of interest to your readers. (1) Mineral oil can be, and is being, produced which is non-carcinogenic. (2) A non-carcinogenic mule spindle mineral oil known commercially as white oil is on the market. (3) Exhaustive tests on the skin of mice indicate that it is no more likely to cause tumours in mice than olive or sperm oil. (4) Coal as such is not carcinogenic, but some of its products will be if it is destructibly distilled above a certain temperature. (5) So far as is known, any organic matter will yield carcinogenic products if destructibly distilled at a high enough temperature. It cannot, therefore, be considered odd that the products of coal and petrol which have lain under the earth for centuries should have carcinogenic properties.

Southwick, Sussex.

J. M. TWORT.

UREA-FORMALDEHYDE RESINS IN ORTHOPÆDIC SURGERY

SIR,—When used in setting fractures plaster-of-paris suffers from many defects, including impermeability to X rays, lack of resistance to water, and an inherent brittleness. Urea-formaldehyde synthetic resin adhesive has none of these failings, but much remains to be done to make it a practical contribution to orthopædic surgery. Preliminary trials have been carried out as described here, and it is hoped that from these data further development will be possible.

The urea-formaldehyde resin 'Casco-Resin P' was selected because it has a viscosity suitable for impregnation and a low free-formaldehyde value, and is fairly highly condensed, thus requiring relatively low acidity to harden it at room temperature. The solids content is 60%. Urea-formaldehyde resins may be hardened at room temperature by the use of acid or acid-developing catalysts or hardeners; but they are fundamentally thermo-setting, and full condensation is best obtained by the application of heat, either by direct conduction, infra-red radiation, or high-frequency induction.

The first experiment was the preparation of a bandage for a supposedly fractured wrist. The wrist was treated with an anti-dermatitis cream, and two or three turns of a 2-in. white open-wove bandage were put round it. Another 2-in. bandage was immersed in a beaker containing casco-resin P 100 parts by weight and hardener 'M-1' 10 parts by weight. The bandage was unrolled in the liquid and drawn out between two glass rods to remove the surplus resin. It was next wound on the wrist and baked in front of an electric fire for half an hour, at the end of which the outer layers of the bandage had hardened, thus giving support and rigidity. Next morning the bandage was hard and rigid throughout and, though only $^{1}/_{8}$ in. thick, gave as firm support as a much thicker and more cumbersome plaster-of-paris bandage.

Several of these bandages were prepared, and in some cases the "patients" took hot baths, immersing the bandage without any special precautions, and there was no softening or reduction in strength. The bandages were easily cut off with shears, and there was no sign of skin irritation or dermatitis.

Casco-resin P requires an acid medium in which to harden and become rigid, a pH lower than 5·5 being usually needed. This acidity tended to destroy the cellulose of the cotton bandage at the edges, where thin layers became very brittle. To overcome this, experiments were carried out with thin flannel bandages, and the protein nature of the wool was much more resistant to acid. A notable feature of these bandages was their resilience, coupled with strength and rigidity.

The results of this work were shown to a doctor, who suggested the production of light-weight rigid jackets or spinal ailments.

One of his patients had collapse of the spine due to a malignant growth and had recently been fitted with a support made of steel and leather. This support was rigid, heavy, and in no way moulded to the patient, and the discomfort of wearing such a support was accentuated by scars of operations for kidney trouble. It was decided to mould a back support to the shape of the patient, leaving slight hollows at the sites of the operation scars to prevent pressure. Six shaped pieces of thin woollen material were impregnated with the resin/hardener mixture, which has a usable life of 1 hour at 60° F. The impregnated pieces were hung up to dry for $^{3}/_{4}$ hour, at the end of which the resin had become tacky and tended to gel. The patient was then laid on a couch, with supports so placed that the back was as near to the natural upright position as possible. The back was treated with a barrier cream and plain unimpregnated cloth laid on. A piece of gamgee tissue was placed on the site of the operation scars to provide the necessary packing. The impregnated cloths were then laid on one at a time, care being taken to shape them to the back. When the complete six had been assembled, heat was applied with six infra-red lamps until sufficient rigidity had been produced in the support to bond the laminæ together and allow of removal without distortion; this took about $^{3}/_{4}$ hour. The finished article was rigid, resilient, light, shaped to the patient's back, and easily cut with a fretsaw and machined with a small milling tool or file. One layer of fabric had wrinkled, and this ridge was readily machined out. The hollows caused by the gamgee tissue prevented any pressure on tender spots. Straps and a supporting belt, inserted during the preparation, secured the support in position.

The above method and the final product had two obvious defects: (1) the long time taken to harden the resin in situ, with the discomfort of the patient in maintaining that position; and (2) the moulding taken of a person lying down did not exactly correspond with the upright position, particularly at the base of the spine. To overcome these defects, a cast was made with plaster-of-paris bandages, with the patient standing. From this cast a positive was made and a support prepared in exactly the same way as before, except that the support was left at room temperature overnight, so that by next morning the layers had hardened and been bonded together. The moulding could have been removed then, but it was known from experience that at this stage the resin was liable to large dimensional changes and distortion; it was therefore strapped to the plaster cast and baked in an oven at 140° F for an hour and allowed to season at room temperature for two hours, at the end of which the resin had been completely "cured," and on removal from the plaster cast the moulding remained rigid and was not subject to warping or twisting. The moulding was trimmed, the edges were bound with adhesive tape, and the appliance was given to the patient for trial. The fit was perfect, particularly round the waist, where the shaped moulding could give support; the raised parts eliminated any pressure on the tender spots; and the apparatus weighed only 10 oz. as against $3^{1}/_{2}$ lb. and $5^{1}/_{2}$ lb. for the two leather and steel appliances previously fitted.

This work has been somewhat crude and spasmodic, but it has established the possibility of using the urea-formaldehyde resins in orthopædic surgery to produce lighter appliances tailored to each patient.

I wish to thank Messrs. Leicester, Lovell & Co. Ltd., of Stroud, Glos., for whom the work was done, for permission to publish the results.

Leicester. H. A. COLLINSON.

RESEARCH ON TUBERCULOSIS

SIR,—In the course of correspondence in the *British Medical Journal* I have suggested (July 20, p. 101) that the profession itself should create an Institute for Tuberculosis Research. My reason for making this suggestion is that I fear that if we wait for the Government to found such an institute we may have to wait for many years. The scope and method of its work cannot, of course, be decided without knowing the views of those interested, and I am anxious to discover what support the project might secure. May I ask your readers who are attracted to the idea to let me know (*a*) that, in principle, it has their support, and (*b*) what sum they might annually be prepared to subscribe if called upon to do so? If within the next few weeks there is an adequate response, a meeting of supporters will be called—the expenses of which I shall gladly defray. I believe that if such a scheme were initiated by the medical profession it would be largely supported by public bodies and members of the public.

A. G. NEWELL
Medical Officer of Health for Blyth.

22, Marine Terrace, Blyth, Northumberland.

Parliament

ON THE FLOOR OF THE HOUSE

THE House is up, and Ministers and members seem to be scattering over most of the habitable globe. Many are going on "missions" of one kind or another, and there is talk of a look-see into the conditions of serving officers and men in various different theatres of operations—or rather, theatres of occupation. There have been growls from many theatres and some of the growls have come from the medical services.

A Supply day last week was devoted to the Control Commission in Germany. A recent committee had reported that the citizens of this country are paying for civil government and goods and services supplied to Germany something like £80 million a year. And though, as the Chancellor remarked in the debate, we learned after the 1914–18 war the futility of asking for reparations from the enemy, we did not expect that we should ourselves be paying reparations to Germany like this. Nevertheless we are getting good value for the payment in the British zone. For after the most disastrous war in history, with the destruction of houses, and (even more important) of railways and means of communication, we have got the zone controlled without either epidemic disease or civil commotion. The Germans were adequately fed until March of this year, and their period on the low-ration scales which they imposed on the French and the Dutch during the occupation is not likely to last any longer than in France or Holland. There was much criticism of the failure of the four zones in Germany to combine, and much criticism directed, especially from the Conservative benches, against the Russian zone. And there was a plea by Mr. Lyttelton, as chief Opposition speaker, for handing over "the details of the government of Germany" to the Germans. He accused the Government of tearing up "every provision of Magna Carta and Habeas Corpus"—on the ground that 40,000 persons, belonging to the Nazi organisations, are being held in concentration camps. This did not strike many members as a large proportion out of 22 million in the British zone. Nor did it strike them as an unnecessary precaution, with the words of Attorney-General Shawcross, at the Nuremberg trial still sounding in their ears. Mr. Noel-Baker, replying for the Government, was not sympathetic to those who wanted to repatriate potentially dangerous Nazi prisoners-of-war now in this country, but he was so much interrupted that the Deputy-Speaker had to intervene. When, however, he announced a new Government policy—that of working the British zone in combination with the American zone and giving an open invitation to the French and the Russians to join in—the House listened attentively and in silence. Mr. Hynd, the Minister in charge of the British zone, made a spirited defence of the administration and after many interruptions brought the debate to the safe harbour of 9.30 P.M., when it concluded on a note o reasoned optimism.

On Wednesday and Thursday we discussed Palestine, with the explosion at the King David Hotel much in our minds. Mr. Morrison presented the Government's proposals for its division, with a Jewish and an Arab province, a central Jerusalem district, and an extra desert province of the Negeb. Mr. Stanley, for the Opposition, accepted these proposals as a second best to outright partition. And possibly it is the way to partition. But in the present circumstances of desperate underground warfare the difficulties of any solution are very great.

On Wednesday the Palestine debate was adjourned at 10 P.M., and the House went on to consider prayers against regulations for food-rationing, which went on until nearly 4.30 A.M. and would have gone on longer had the Opposition managed to keep enough members on the premises. (If members demand a count, and there are found to be less than 40 present, the House stands adjourned.) But next day Palestine started all over again, and Mr. Churchill intervened as a supporter of a Jewish National Home in Palestine, which is not the same thing as regarding Palestine itself as a Jewish National Home. If, said Mr. Churchill, we feel that we are "unable to carry out properly and honestly the Zionist policy . . . it is our duty to offer to lay down the mandate"; and it was widely agreed that if the Americans will not coöperate in this plan of a provincially divided Palestine we shall have no option but to do so. Churchill proposed that "if the United States will come and share the burden . . ." we should now e notice to Uno that we will return the mandate l evacuate Palestine within a specified period. But doing this we must also inform Egypt that we will y all means maintain our position in the Canal zone." ssionate protest, Imperial strategy, historical reminisice—in such a way the debate went on. But at the l Mr. George Hall, the Colonial Secretary, was given quiet hearing for very vigorous sentiments very gently ressed, and the debate faded out. No vote was taken l the matter stands referred for the decision of esident Truman as to whether the United States will cept joint responsibility. On the last day of the session . Noel-Baker announced that the United Nations cussions on the control of atomic energy had reached ond-reading stage, and that the Government accepted principle both the U.S.A. and the U.S.S.R. proposals, ich they thought could be amalgamated.

MEDICUS, M.P.

QUESTION TIME

University Grants Committee

In a written answer Mr. H. DALTON, Chancellor of the xchequer, stated: I am anxious that, in this new phase of pid expansion and planned development of our universities, e University Grants Committee should play a more positive d influential part than in the past. The committee have, erefore, been given new terms of reference, as follows:

> To inquire into the financial needs of university education in eat Britain; to advise the Government as to the application any grants made by Parliament towards meeting them; to llect, examine and make available information on matters relating university education at home and abroad; and to assist, in nsultation with the universities and other bodies concerned, the eparation and execution of such plans for the development of the iversities as may from time to time be required in order to ensure at they are fully adequate to national needs.

Grants for Medical Research

Mr. PETER FREEMAN asked the Chancellor the amount of ant made for the purpose of medical research for the last) years; for what special objects it could be used; and how had been spent during the last year, with any detailed assifications available.—Mr. DALTON replied: Grants to e Medical Research Council have been as follows:

	£		£
937–38	195,000	1942–43	195,000
938–39	195,000	1943–44	215,000
939–40	265,000*	1944–45	250,000
940–41	195,000	1945–46	295,000
941–42	195,000	1946–47	480,000†

* Including £70,000 capital building grant.
† Including £100,000 capital building grant.

edical research is also assisted by the Exchequer grants ade to universities and teaching hospitals, though it is not ossible to say what proportion of these grants is spent for is purpose. The annual grant to the Medical Research ouncil is available for medical research in all its branches. he grant for the year 1945–46 was allocated by the council s follows:

	£
dministration and general purposes	29,260
ational Institute for Medical Research	101,167
esearch Units and External Staff	105,864
emporary Research Grants	58,709
	295,000

Supplies of Penicillin

Mr. JOHN LEWIS asked the Minister of Supply (1) if he ould state the price at which penicillin was supplied by the anufacturers; and if any price agreement existed between them; and (2) which firms were engaged on the manufacture of penicillin in this country; and what was the output of each concern during the months of May and June.—Mr. WILLIAM LEONARD replied: Glaxo Laboratories Ltd., operating commercially, and Distillers Company Ltd., operating a Government factory as agents for the Ministry of Supply, are the main producers of penicillin in this country. Production on a smaller scale is undertaken by Boots Ltd., Imperial Chemical Industries Ltd., and Kemball Bishop & Company. The great bulk of the output of these concerns is purchased by the Ministry, and it would be contrary to established practice to disclose details of the contracts. There is no price agreement among the manufacturers.—Mr. LEWIS: What restrictions are there on firms not previously engaged in the production of penicillin, who now wish to do so?—Mr. LEONARD: None other than the normal requirement of compliance with the Therapeutic Substances Act if the penicillin is to be used for injection.

Supplies of Streptomycin

Mr. THOMAS BROOKS asked the Minister of Health, in view of the serious incidence of new cases of tuberculosis and the high death-rate associated with this disease, what steps were being taken to import supplies of the drug streptomycin from the U.S.A.; and what efforts were being made for its manufacture in this country.—Mr. A. BEVAN replied: I am informed that American production of streptomycin is too small to permit export to this country. Arrangements are being made with the Ministry of Supply and the Medical Research Council to set on foot the manufacture in Great Britain of sufficient streptomycin for adequate clinical trials.

Release of Specialists from the Forces

Sir ERNEST GRAHAM-LITTLE asked the Secretary of State for War whether he was aware of the wastage of specialist man-power in the Forces, in particular of orthopædic and surgical specialists; and whether he would consider the early release of graded and recognised specialists in the Forces, who were specialists only by virtue of recognition by the Forces medical directorates and who, on reversion to civil life, would require to secure the higher qualifications in their special branch if they were to continue civil specialist practice.—Mr. J. J. LAWSON replied: I am not aware of any wastage of specialists in the Army. Cases which have been investigated have shown that the officers were essential because of the distances involved. I am not prepared to single out Army-trained specialists for early release, as that would break down the basis of release by age-and-service group priority. Officers desirous of obtaining higher qualifications may apply for assistance on their release under the Government's scheme of postgraduate medical education for ex-Service medical officers, or under the further education and training scheme.

Psychiatric Treatment in Prisons

Dr. BARNETT STROSS asked the Home Secretary how many medically qualified psychiatrists were employed full-time and how many part-time in British prisons.—Mr. C. EDE replied: Of the 28 whole-time medical officers at present in the prison service, 6 hold the diploma of psychological medicine, and all the more senior medical officers in the service have had considerable experience in psychiatry. There are 3 medically qualified part-time psychiatrists. All cases in which there is any reason to think psychiatric treatment might be beneficial, whether a court has or has not suggested such treatment, are investigated, and if it appears likely that such treatment will be advantageous during the prison sentence it is provided.

Priority Rations for the Tuberculous

Mr. BOYD CARPENTER asked the Minister of Food what medical advice he had obtained as to the adequacy of food allocations at present made to sanatoria.—Mr. JOHN STRACHEY replied: I am guided on all medical matters by the food rationing (special diets) advisory committee of the Medical Research Council, and the committee has always kept in close touch with the Tuberculosis Association and the National Association for the Prevention of Tuberculosis on all matters pertaining to this disease. The special diets committee is satisfied with the provisions which are being made for sanatoria under present circumstances, and these provisions are approved by the associations I have mentioned.

Major NIALL MACPHERSON asked the Minister whether he would arrange for a priority ration of eggs to be made regularly to persons suffering from tuberculosis against a doctor's certificate.—Mr. STRACHEY replied: It is with much reluctance that I cannot, at present, adopt the suggestion. The special diets advisory committee have given careful consideration to the special needs of these patients and the extra foods, 14 pints of milk and 1 oz. of cooking fats a week, which have been allowed are in accordance with their recommendations.

Diphtheria Immunisation

Mr. PETER FREEMAN asked the Minister of Health whether he would see that in all future advertisements recommending the practice of immunisation a statement was added stating that 19,040 children contracted diphtheria after submitting to this operation and of these 142 died, in the last five years, in order that the public might have the full facts concerning immunisation.—Mr. BEVAN replied: No, nor can I agree that this would be giving the public the full facts. Obviously you cannot guarantee absolute immunity in every case; but the most striking facts are that the chance of a child's death from diphtheria is 26 times greater if it is not immunised and that deaths from diphtheria have been reduced to about a quarter of the pre-war yearly average.

Leaflets Attacking National Health Bill

Mr. P. C. GORDON-WALKER asked the Attorney-General what steps he was taking to discover and prosecute the authors of the leaflets attacking the National Health Bill, copies of which had been sent to him, as they lack the imprint of publisher or printer.—Sir HARTLEY SHAWCROSS replied: Inquiries are still being made as to the authors, publishers, and printers of these pamphlets. I would point out that those who publish or disperse propaganda pamphlets of this kind which do not contain the printer's name and address commit an offence under the Newspapers, Printers and Reading Rooms Repeal Act, 1869.

Vivisection Inspectors

Mr. C. CHALLEN asked the Home Secretary for what reason he had decided that a medical qualification was more necessary than a veterinary one for his inspectors operating under the Cruelty to Animals Acts, in view of the fact that the welfare and condition of the animals involved were just as much a part of their responsibility as the requirements of medical research.—Mr. EDE replied: I have two main duties under the Act. One is to see that places where experiments are performed are properly inspected, and medical men are well able to do this. The other is to decide whether authority should be given for proposed experiments and, as the vast majority of the experiments are for the purpose of alleviating human suffering, an inspector without medical qualifications would rarely be in a position to give me the advice I require in this connexion.

Infant Mortality in British Zone

Replying to a question, Mr. JOHN HYND stated that, over the first four months of this year, the infant mortality-rate for the British zone of Germany and the British sector of Berlin was 111 per 1000 live births.

Food Gifts for Hospitals

Mr. W. S. CLUSE asked the Minister of Food whether he was aware that large supplies of gifts from abroad, of food of various kinds, were being distributed to hospitals who were already well supplied through the ordinary channels; and whether he would arrange a distribution to old-age pensioners and other deserving people, after due regard for the welfare of hospital patients.—Mr. J. STRACHEY replied: This is already being done. 70% of all food gifts from abroad is distributed to aged and needy people through local authorities in all parts of the country. The remaining 30% is divided between hospitals, charitable institutions, including homes for children and elderly people, and workers' rehabilitation centres.

Training of Nursing Orderlies

Mr. SOMERVILLE HASTINGS asked the Secretary of State for War if he would arrange that the training of nursing orderlies in the Services was of such a standard as to be accepted by the General Nursing Council so that time spent in such training would count automatically for the diploma of State-registered nurse.—Mr. F. J. BELLENGER replied: The full training in all three Services is such that it is accepted by the General Nursing Council for the purpose of admission to the examination for State registration. During the war the period of initial training of nursing orderlies had necessarily been shortened but the full training course is now being reintroduced in the Royal Navy and the Army, and will be reintroduced in the Royal Air Force as soon as possible.

Obituary

WILLIAM GEMMILL

M.A., M.B. EDIN., CH.M. BIRM., F.R.C.S.

THE death of Mr. William Gemmill, joint professor surgery in the University of Birmingham, on July after a short illness, coincided with the close of h activities at the university and as honorary surgeon t the United Hospital; indeed it was announced in th press side by side with the appointment of his successo the new whole-time occupant of the chair.

A Lowland Scot by birth, Gemmill was educated a Edinburgh University, where he graduated M.A. in 190 taking his M.B. four years later. After graduation h methodically continued his training, taking the Englis F.R.C.S. in 1913; and the first world war completed hi apprenticeship as a surgeon, for at the end he was i charge of a surgical division of a general hospital wit the B.E.F. The long preparatory period, betwe 1905 when he qualified and 1920 when he was appointe assistant surgeon to the Queen's Hospital, Birmingha was the keynote to his attainments. He had a thoroug knowledge of surgery over an unusually wide field, whil meticulous care and a broad experience gave him great diagnostic acumen and a sound impartial judgment. He was essentially a general surgeon of the old type; but if the war had not deflected his training he would probably have specialised in neurosurgery, which wa always his major interest.

Such men as he form a backbone to surgical training in a medical school and are at their best in the intimate relationship of bedside teaching rather than in the formal procedure of the lecture theatre. He had a great many friends among the practitioners of Birmingham, and he put himself and his skill unreservedly at the disposal of them and their patients. Reserved and shy, he was a difficult man to know; but his patients, with their capacity to penetrate the outward shell, instinctively trusted his strength and kindliness.

With his tenacity, reserve, and general outlook Gemmill was a true Lowlander, and though he had no particular hobby a return to Scotland seemed always to bring him new reserves of strength and refreshment o spirit. But a permanent return to his beloved hills t spend his years of retirement was a dream to remai unfulfilled; and his loss will be greatly felt by his patients and friends throughout the Midlands.

S. B.

Medical Diary

AUG. 11 TO 17

Thursday, 15th

EDINBURGH POSTGRADUATE LECTURES

4.30 P.M. (Royal Infirmary.) Dr. J. K. Slater: Trauma as a Cause of Organic and Functional Nervous Disease.

Appointments

ANNAN, W. G., M.D. Edin., F.R.C.S.E.: dermatological speciali medical referee for county-court districts of Barnard Cast Darlington, Middlesbrough, Northallerton, Richmond, Stockton-on-Tees, Stokesly and Guisborough, Bishop Auckland, Durha and West Hartlepool (circuit no. 2).

University College Hospital, W.C.1:
- EDSWORTH, J. D., M.R.C.S., D.A.: asst. anæsthetist, Nation Dental Hospital.
- ROSENHEIM, M. L., M.D. Camb., F.R.C.P.: asst. physician.
- WADGE, WINIFRED J., M.B. Lond., F.R.C.S.: asst. surgeo E.N.T. dept.

Hampstead General and North-West London Hospital:
- HARRIS, E. O., M.B. Lond., F.R.C.S.: E.N.T. surgeon.
- HOWKINS, JOHN, M.S., M.D. Lond., F.R.C.S., M.R.C.O.G.: gynæco logist to outpatients.
- STEEL, G. C., M.R.C.S., D.A.: anæsthetist.
- WALTON, HARRY, M.R.C.S., D.A.: anæsthetist.

Hull Royal Infirmary:
- BLACKBURNE, J. R., M.B. Lond., F.R.C.S.: asst. surgeon.
- BROWN, G. S., M.C., M.B. Edin., F.R.C.S.E., M.R.C.O.G.: gynæco logist.
- HALLIWELL, E. O., M.R.C.P.: physician.
- MASON, J. I. C., M.B. Lond., F.R.C.S.: asst. surgeon.
- MILLER, S. J. H., M.B. Aberd., D.O.M.S.: asst. ophthalmic surgeon.
- PATRICK, ANDREW, M.B. Edin., F.R.C.S.E.: surgeon.
- STEWART, D. D. S., M.R.C.S., D.O.M.S.: ophthalmic surgeon.
- TATHAM, R. C., F.R.C.S.: orthopædic surgeon.
- WHITEHEAD, N. T., M.C., M.B. Lond.: pathologist.

Examining Surgeons under the Factories Act, 1937:
- CRESSWELL, P. E., B.M. Oxfd: Merthyr Tydfil, Glamorgan.
- DAVISON, T. R., M.B. Durh.: Colne, Lancs.
- GROVES, J. N., D.S.O., M.B. Camb.: Ledbury, Hereford.
- SHEPHERD, HYMAN, M.R.C.S.: Newport, Monmouth.

Notes and News

THE BUREAU OF CURRENT AFFAIRS

Since 1941 the Army has had a bureau of current affairs which has arranged and encouraged group discussions among vice men and women by means of bulletins, "pictorial s," information services, and short training courses for russion-group leaders. A civilian organisation of similar e, sponsored by the Carnegie United Kingdom Trust, ; now been set up, with the aim of providing the same t of services for existing discussion groups and for new ups established by educational and social bodies, including bs, community centres, factories, schools, and "neighbour-od societies." It will issue fortnightly a discussion-brief pamphlet form for the use of the group leader, giving iable and well-documented agenda on selected themes, ch as housing, schools, population, full employment, and e National Health Service. The pamphlet, besides a popular position of the subject by an accepted authority, will ntain a layout for discussion, and illustrations—line-awings which the leader can reproduce on the blackboard, d pictorial devices to express difficult points. A map view, also published once a fortnight, in poster size, carries one side maps, pictures, and diagrams relating to current fairs, and on the reverse side illustrations of major political, cial, and economic problems of our time. For example, e map review for June 13–26 sets out, with the aid of otographs and figures, the main facts about milk-production d distribution, and a little—not quite enough—about the provement of milk. The address of the bureau is Carnegie ouse, 117 Piccadilly, London, W.1.

AUTOXIDATION OF ETHER

Dr. Gunnar Lindgren[1] has made a careful experimental udy of the chemical, biological, and clinical aspects of this ifficult subject, on which much has previously been written. e begins by describing methods for detecting and estimating he products of autoxidation—chiefly peroxides and acet-ldehyde. Then follows an account of analyses of various ommercial brands of ether sold for medical use, and of the tabilising effect of adding inhibitors like diphenylamine to uch samples. In tests carried out with pure ether, autoxidised ther, and ether stabilised with diphenylamine, no difference was observed clinically between any of the samples.

INCIDENCE OF SYPHILIS

Last year 10,706 new cases of syphilis were treated at linics in England and Wales; this is the highest total for at least fourteen years, being 1388 more than in 1944, and more than double the 1939 total of 4986. The Ministry of Health, eporting these figures, states that the campaign of public education on venereal diseases is to be continued.

PSYCHIATRY AT SEA

In *Fear No More*, which the Company of Four are presenting at the Lyric Theatre, Hammersmith, Mr. Arcularis, the patient, has a bad time. We meet him first on the operating-table, receiving an anæsthetic before a serious operation, during which the watching medical students are assured they will see his heart beating in the surgeon's hand. Though the audience do not share this privilege, for the curtain falls before the operation begins, they do have a fairly complete view of Mr. Arcularis's inner recesses during his stormy convalescence aboard the good ship *Kafka*. On this pleasure cruise his fellow passengers bear an uneasy likeness to the patron, nurses, and doctors of the hospital; there is a coffin in the hold which he visits nightly while sleep-walking, and he has a trying interview with his late wife who committed suicide some years earlier. No, he did not actually kill her, but he had the will to kill; and this apparently saps the will to live, for we return to the operating-theatre to see him die on the table. The play is based on a short story by Conrad Aiken. Surgeons should see it for the sake of the psychiatry, and psychiatrists for the sake of the surgery.

FAMILY PLANNING CLINICS

A list of voluntary and municipal clinics giving advice on contraception, and in many cases on subfertility, is published by the Family Planning Association, 69 Eccleston Square, London, S.W.1. At 52 of the 60 voluntary clinics in Great Britain and Northern Ireland every patient is seen by a doctor. In England, Wales, and Scotland there are 63 municipal clinics giving advice on birth-control to women who need it on medical grounds. Several of the municipal and voluntary clinics have more than one centre. At three of the voluntary clinics, owing to pressure of numbers, no patients are seen whose incomes exceed £6 a week.

THE FAMILY ALLOWANCE

Family allowances, at the rate of 5*s.* a week (subject to income-tax) for the second and subsequent children of each family, were paid for the first time in this country on Tuesday last.

In the course of a leading article on that date the *Times* says: "If it wishes to encourage parenthood . . . the community cannot rest content even with the equalitarian aim of abolishing absolute poverty in childhood. There remains the more intractable difficulty of differential poverty—the gap in the opportunities and living standards between the small or childless family and the large family at each level of income. . . . This differential poverty, which is felt with special severity by professional workers with relatively high cultural standards, can certainly not be removed by weekly allowances of 5*s.*, themselves subject to tax. In the life of all such social groups with high ambitions, income taxation in its present form, even combined with all the new children's benefits and services, is not likely to halt that progressive squeezing out of children which has been proceeding for more than a generation. One reform which needs to be considered is the use of the income-tax and family allowance system not merely as a means of levelling up or levelling down all families nearer to a happy mean, but also, at each income level, as a means of securing that the family with several children is not substantially worse off, when account is taken of its size, than the family with fewer children or none. Alternatively, much might be done by the promotion of occupational schemes, supplementary to the State scheme."

University of Oxford

The following degrees were conferred on July 27:

D.M.—C. W. Hope-Gill, R. C. Browne.
M.Ch.—S. F. Taylor.
B.M.—G. N. Chandler, D. H. Brooks, J. N. Cozens-Hardy, R. H. Hardy, P. L. Pickering, J. M. K. Spalding, J. L. Hadley, P. S. Brown, Brian McConkey, H. L. Backhouse, G. A. K. Missen, Margaret Lingard, Jean C. Ritchie; and H. J. F. Cairns, P. M. de C. Williams, L. T. Cotton, A. G. Hayter, P. R. Clay, Gert L. Loewi, Diana Geekie, Marianne E. Rooth (all in absence).

University of Leeds

As announced last week, Dr. W. S. M. Craig has been appointed to the full-time chair of pædiatrics and child health.

Dr. Craig graduated M.B. at Edinburgh in 1930, when he won the Buchanan scholarship. In Edinburgh he held appointments as clinical assistant, assistant pathologist, and house-physician at the Royal Hospital for Sick Children, as assistant pædiatrician at the Royal Maternity and Simpson Memorial Hospital, and as lecturer in the department of child health. In 1932 he became M.R.C.P.E., and was awarded the John Thompson memorial medal in diseases of children; the following year he graduated M.D., with commendation, and in 1936 he was elected F.R.C.P.E. He is also a fellow of the Royal Society of Edinburgh, and a member of the British Pædiatric Association. Since 1936 he has held appointments with the Ministry of Health; in 1941 was seconded to the Emergency Medical Service as regional hospital officer and later medical officer in charge of the south-eastern region. He has written extensively on pædiatric problems, and has recently produced a textbook, *Child and Adolescent Life in Health and Disease: a Study in Social Pædiatrics.*

University of Edinburgh

Mr. R. J. Kellar has been appointed to succeed Prof. R. W. Johnstone as professor of midwifery and diseases of women from Sept. 1.

Thirty-seven years of age, he was educated at George Watson's College and the University of Edinburgh, where he graduated M.B. in 1931, being awarded the Buchanan prize in midwifery and gynæcology, the Annandale gold medal in clinical surgery, the Wightman prize in clinical medicine, and the Murchison scholarship in medicine. After graduating he was awarded a Freeland Barbour fellowship in obstetrics, a Leckie-Mactier fellowship in medical research, the Simpson prize in obstetrics, and the Lister prize in surgery. He was in general practice for some months, and later held appointments at the Royal Infirmary, the Royal Maternity Hospital, and the Deaconess Hospital, Edinburgh. In 1934 he became M.R.C.P.E., and in the following year F.R.C.S.E. In 1935 he was appointed assistant to the obstetric unit at University College Hospital, London, but in 1937 he resigned from this post and from a Beit fellowship to become reader in obstetrics and gynæcology at the British Postgraduate Medical School. In 1939, as a Territorial, he was mobilised as a regimental medical officer. He served as surgeon to a C.C.S. in the Western Desert from 1940 to 1942, and for the next three years was officer-in-charge of surgical divisions in the Western Desert and north-west Europe. In 1942–43 he was adviser in gynæcology to the Middle East Forces. He was demobilised last year, and was appointed M.B.E. He was elected F.R.C.O.G. in 1945, and F.R.C.P.E. this year. His recent published work has been mainly concerned with problems of recurrent toxæmia, and hypertension, in pregnancy.

---

[1] Autoxidation of Diethyl Ether and its Inhibition by Diphenyl-Amine. Stockholm: *Acta Chirurgica Scandinavica*. Pp. 190.

University of London

As announced last week, Dr. N. Hamilton Fairley, F.R.S., has been appointed to the Wellcome chair of tropical medicine tenable at the London School of Hygiene and Tropical Medicine.

Dr. Hamilton Fairley qualified M.B., with first-class honours, at Melbourne in 1915. From 1916 to 1919 he was pathologist and later senior physician to the 14th Australian General Hospital in Egypt, where he was appointed O.B.E. in 1918. In 1920 he became assistant director of the Hall Research Institute, Melbourne Hospital, *and from 1922 to 1926 he was Tata professor of tropical medicine,* Bombay. In 1927 he took the D.SC. at Melbourne, and the following year he was elected F.R.C.P. From 1927 to 1929 he held a special appointment as Commonwealth research officer at the Hall Research Institute, and he was subsequently appointed assistant physician and director of pathology to the Hospital for Tropical Diseases, London. In 1931 he was awarded the Chalmers memorial medal for research in tropical medicine. Before the outbreak of war he was physician and director of special research to the Hospital for Tropical Diseases, London, and lecturer in tropical medicine at the London School of Hygiene and Tropical Medicine and the Westminster Hospital.

In 1940 he went to the Middle East as consulting physician to the 2nd A.I.F., and in 1940–41 acted as tropical consultant, headquarters, Middle East, to the British Forces, for which services he was appointed C.B.E. In 1942 he was elected F.R.S., and in the same year was appointed director of medicine, Australian Military Forces, with the rank of brigadier. From 1943 to 1946 he was also chairman of the advisory committee on tropical diseases, hygiene, and sanitation to General MacArthur at headquarters, South-west Pacific Area, and director, Land Headquarters medical research unit, Cairns, where researches of far-reaching military importance on the chemotherapeutic control of malaria by mepacrine, paludrine, and other antimalarial drugs were carried out on experimentally infected volunteers.

Dr. Hamilton Fairley is author of the section on tropical medicine in Price's *Textbook of Medicine.* His publications include original studies in the dentition and biting mechanism of colubrid snakes; new serological tests in helminthiasis, including the introduction of cercarial antigens in the diagnosis of mammalian schistosomiasis *and scolex antigen in the diagnosis of hydatid disease*; and the discovery and synthesis of the blood pigment, methæmalbumin, found in conditions like blackwater fever associated with intravascular hæmolysis and hæmoglobinuria.

University of Birmingham

As announced last week, Dr. J. M. Smellie has been appointed to the full-time chair of pædiatrics in the university.

Dr. Smellie qualified M.B. at Edinburgh in 1916. After holding an appointment as house-physician at Edinburgh Royal Infirmary, he joined the Royal Army Medical Corps, and served in Macedonia. On demobilisation, in 1920, he graduated M.D., and held posts as resident medical officer to the General Hospital, Birmingham, and assistant casualty officer to the Hospital for Sick Children, Great Ormond Street, London. He returned to Birmingham in 1922 when he was appointed physician to outpatients and pathologist to the Children's Hospital, and medical registrar and pathologist to the Queen's Hospital. In the same year he obtained the M.R.C.P. He *was appointed assistant physician to the General Hospital in 1924,* and consulting physician to the Royal Cripples Hospital in 1930. In 1932 he was elected F.R.C.P. He is an original member of the British Pædiatric Association and was on the executive committee from 1938 to 1940. Dr. Smellie served throughout the whole of the late war as an officer in the Territorial Army, and during the last twelve months was consulting physician, Eastern Command, India. He was appointed O.B.E. in 1944.

Dr. W. Melville Arnott who has been appointed to the full-time chair of medicine is 37 years of age.

He was educated at George Watson's College and the University of Edinburgh, where he gained the Grierson bursary in pathology and the Vans Dunlop scholarship in surgery and pathology, and qualified with honours in 1931. After various house-appointments, he devoted himself to clinical medicine combined with work in the university department of pathology, mainly on renal disease, with particular reference to experimental renal hypertension and experimental glomerulo-nephritis. In 1933 he became M.R.C.P.E., and the following year he graduated B.SC., with first-class honours in pathology. He held posts as clinical tutor in the Royal Infirmary, assistant physician in the Edinburgh municipal hospitals, lecturer in clinical medicine, and, from 1936, lecturer in therapeutics under Prof. D. M. Dunlop. In 1937 he was elected F.R.C.P.E., graduated M.D. with gold medal, and was awarded the Gunning prize in pathology. As a Territorial officer, he was mobilised on the outbreak of war, and spent five of six years' service overseas, as a medical specialist and officer-in-charge of medical divisions, with the rank of lieut.-colonel. He served in North China, Malaya, Ceylon, North Africa (including the siege of Tobruk), Palestine, and North-west Europe; he was awarded the Territorial Decoration and was mentioned in despatches. Since he was demobilised last year, he has been acting director of postgraduate medical studies in Edinburgh. In April he was elected assistant physician to Edinburgh Royal Infirmary

Mr. F. A. R. Stammers has been appointed to the full-time chair of surgery.

In the war of 1914–18 Mr. Stammers served for two years as a subaltern in the Royal Artillery. He graduated B.SC. *at Birmingham* in 1920, and M.B. three years later. After working as house-surgeon and resident surgical officer at Birmingham United Hospitals, resident medical officer at the Birmingham Children's Hospital, and demonstrator in anatomy in the university, he took the F.R.C.S. examination in 1925, and with a Rockefeller fellowship went to the United States, where he studied in the Mayo Clinic. In 1936 he was awarded the mastership of surgery (official). In the late war he served, for the first three years as officer-in-charge of surgical divisions in England and in West Africa, and for the second three years as consulting surgeon, with the rank of brigadier, to Western Command; *and* later to the Allied Armies in Italy; he was appointed C.B.E. mentioned in despatches. He is consulting surgeon to the I Hospital, Birmingham, and honorary surgeon to the United H pitals and the Children's Hospital, and is at present assis lecturer in clinical surgery at the university. Among his no publications have been papers on peripheral vascular disord lymphogranuloma inguinale, delayed suture, and gas-gangrene.

Royal College of Surgeons of England

A meeting of the council was held on Aug. 1, with Sir Alfr Webb-Johnson, the president, in the chair. Prof. G. Gr Turner was reappointed representative on the council o King's College, Newcastle, for a further period of three yea Prof. D. T. Harris was elected an examiner in physiology, a Dr. Arthur Massey and Dr. William Blood examiners for th diploma in industrial health. Mr. L. Carnac Rivett w invited to attend meetings of the council during the ensu year as the representative of gynæcology and obstetrics.

Diplomas in public health and of membership were grante to the candidates named in the report of the Royal Colle of Physicians in our issue of Aug. 3 (with the exception o E. I. Bieber, J. R. Handforth, T. L. T. Lewis, and J. Sutherla who already hold the membership.)

A Research Consultant

Lady Florey has been appointed research consultant at th Central Middlesex County Hospital with an honorarium o £250 a year. She has been carrying out investigations at th hospital for some time past while holding a whole-time appointment with the Medical Research Council.

Operating Gowns

Private practitioners needing gowns for obstetrical work, treatment of venereal diseases, operations, or autopsies may now obtain coupon-equivalent certificates which will enable them to obtain six operating gowns. Practitioners in England and Wales should apply, stating particulars, to the Ministry of Health, Whitehall, London, S.W.1; in Scotland, to the Department of Health for Scotland, St. Andrew's House, Edinburgh; and in Northern Ireland, to the British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, enclosing a stamped addressed envelope.

Mr. Geoffrey Parker, D.S.O., has been made a chevalier of the Legion of Honour and awarded the croix-de-guerre with palm. Mr. Parker is surgeon to the French Hospital in London.

OUR list of candidates successful in the *Conjoint* Board's examination for the D.T.M. & H. (June 29, p. 987) should have included the name of Air Commodore E. A. Lumley, M.B., D.P.H. The list as printed comprised only those who entered from the London School of Hygiene and Tropical Medicine.

Births, Marriages, and Deaths

BIRTHS

BAILY.—On July 30, in London, the wife of Surgeon Lieutenant R. A. J. BAILY, R.N.V.R.—a daughter.

BREARLEY.—On July 31, in London, the wife of Dr. B. F. Brearley —a daughter.

COMFORT.—On August 4, in London, the wife of Dr. Alex Comfort —a son.

GRETTON-WATSON.—On July 26, in London, the wife of Dr. B. G. Gretton-Watson—a son.

MACFARLANE.—On July 26, at Witney, the wife of Dr. R. G Macfarlane—a son.

MORRIS.—On August 1, at Perth, the wife of Mr. E. W. T. Morr F.R.C.S., Sudan Medical Service—a son.

ROSS.—On July 29, in Edinburgh, the wife of Mr. James Ross M.B.E., F.R.C.S.E.—a son.

MARRIAGES

AGATE—PREEDY.—On July 26, at Spetisbury, John Norman Agate, M.R.C.P., to Rosemary Hester Preedy.

HOUSTON—CRUICKSHANK.—On August 15, in York, James Caldwell Houston, M.D., M.R.C.P., to Thelma Cromarty Cruickshank, M.B.

RISK—SYMINGTON.—On July 23, at Glasgow, James Mc Symington Risk to Winifred Symington, M.B.

DEATHS

DEAS.—On July 28, at Morden, Surrey, Frank Deas, M.R.C.S. aged 77.

DREVER.—On July 22, at George, S. Africa, formerly of Benoni James Croy Drever, M.B. Edin.

JAMESON.—On July 30, at West Wickham, Robert William Jameson M.D. Brux., M.R.C.S., D.P.H., barrister-at-law, aged 74.

MACKIE.—On July 29, George Mackie, lieut.-colonel, D.S.O., O.B.E., M.D. Edin., of Malvern, aged 67.

MILNE.—On August 4, at New Barnet, Ernest Wardlaw Milne, M.B. Glasg., aged 70.

WACE.—On July 22, at Lansdowne, U.P., India, Michael Henry Wace, M.B.C.S., lieut.-colonel I.A.M.C.

PENICILLIN INHALATION IN PULMONARY DISEASE

J. H. Humphrey
M.B. Camb.
ASSISTANT PATHOLOGIST

H. Joules
M.D. Lond., F.R.C.P.
MEDICAL DIRECTOR AND PHYSICIAN

CENTRAL MIDDLESEX COUNTY HOSPITAL

With the assistance of Muriel E. Smith

The object of the work described here was to find a suitable route, dose, and time interval for treatment with penicillin of chronic infections of the lungs and bronchi.

As the good effect of intramuscular treatment on lobar pneumonia has been in striking contrast to the poor results obtained in chronic conditions, it was decided to explore the possibilities of aerosol inhalations. A rational basis for treatment was first sought by comparing the concentrations of penicillin in sputum following similar doses given by two routes. The results of clinical application of a treatment based on these findings were next studied.

Penicillin in Sputum after Intramuscular Injection.—A technique was devised by which as little as $^{1}/_{48}$ unit of penicillin per c.cm. of sputum could be reliably estimated. It is described in the appendix, together with the precautions taken in collecting the sputum. Samples were obtained, during acute phases of their disease, from coöperative patients with plentiful sputum in whom the clinical diagnosis was beyond doubt. They were nearly all receiving three-hourly intramuscular injections of 15,000 units, but in three cases a single injection of 100,000 units was given and pooled sputum samples were examined during the next twelve hours. All samples covered periods of at least three hours, and some even twenty-four hours. On two occasions penicillin was detected in the sputum within three hours of the first injection. The results are given in table I.

TABLE I—PENICILLIN IN SPUTUM AFTER INTRAMUSCULAR INJECTION

Disease	Patients	Sputa	Penicillin not detected	Penicillin detected :	
				$^{1}/_{24}$–$^{1}/_{12}$ unit per c.cm.	$^{1}/_{6}$–$^{1}/_{2}$ unit per c.cm.
Lobar pneumonia	9	10	2	4	4
Lung abscess ..	3	19	18	1	0
Purulent bronchitis	2	4	4	0	0
Bronchiectasis ..	2	3	2	1	0

The number of samples was not large, but the implications were clear. Whereas significant amounts of penicillin were found in the majority of sputum samples from cases of lobar pneumonia, in lung abscess, chronic bronchitis, and bronchiectasis it was only occasionally detected.

A patient with an acute lobar pneumonia superimposed on chronic bronchitis and emphysema illustrated this point very well. He received three-hourly intramuscular injections of penicillin for a week, and his sputum was assayed for penicillin on different days. During his pneumonia samples contained $^{1}/_{24}$–$^{1}/_{6}$ unit per c.cm.; but, when it cleared and only the chronic bronchitis remained, no penicillin could be detected, though he continued to cough up considerable amounts of sputum.

Penicillin in Sputum after Single Inhalations.—Two types of apparatus for producing a mist were studied, both of which deliver a fine mist containing no droplets coarse enough to be visible to the naked eye.

The first was the 'Collison' inhaler already described by Mutch (1944), which is a robust instrument using compressed gas (usually oxygen) for nebulisation. In agreement with him it was found that most patients could comfortably inhale 5–8 litres a minute, and that the rate of delivery under these conditions was about 1·5 c.cm. of liquid nebulised from a single flask in a quarter of an hour. Patients were instructe to inhale through a mouth-piece and to breathe out throug the nose. By reducing the volume of liquid in the flask s that the bulk of it was nebulised in any one experiment changes in concentration of the residual penicillin solutio due to simple evaporation were avoided as far as possible.

The second type of inhaler is typified by the 'Riddopag or 'Rybar' inhalers, the first of which is illustrated in fig. Such an inhaler can be worked either by a rubber hand-bul or by compressed air generated by a small electric pump. is much less robust and more liable to clog than the first typ but for outpatient use the hand inhaler has obvious advantage The electric pump is more economical and more portable for ward use than are oxygen cylinders, which are heavy and need frequent replenishment. The practice with the hand type was to place 0·5 c.cm. of an aqueous solution of penicillin in the reservoir, and to instruct the patient to place the neck of the apparatus in his mouth and to inhale through his mouth as he squeezed the bulb. This was repeated until all the penicillin had been nebulised—usually 10–15 min.

Coöperative patients were chosen, with a wide variety of lung diseases, including all those mentioned above. They mostly produced 50 c.cm. or more sputum a day, though a few produced less. After inhaling an approximately known dose of penicillin either from the Collison inhaler or the hand spray, their sputum was collected into cartons, which were changed each hour and sent immediately to the laboratory. Here they were kept frozen at −10° C until assayed for penicillin content.

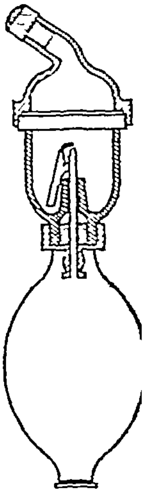


Fig. 1—Riddop inhaler.

The penicillin assay was not nearly so delicate as th used for sputum assay following intramuscular injectio nor was any extraction carried out. Only concentration of 0·3 unit and over could be detected by this metho It consisted in placing a standard loopful of the wel mixed sputum sample on to a blood-agar plate whic had been seeded with the Oxford strain of *Staph. aureu* in the usual way. The plate was examined after incuba tion at 37° C overnight, and the zones of inhibitio were compared with those caused by known amount of penicillin under similar conditions. No evidence destruction of penicillin during testing was obtaine with a number of control sputa. Fig. 2 shows plates wit sputum assays on hourly samples taken from a man wit silicosis and purulent bronchitis after being given 60,00 and 20,000 units of penicillin by inhalation. Fig. shows the results of assays of 111 sputum samples s out in the form of a scatter diagram.

It was not always possible to obtain sputum withi any given hourly period, but all sputa examined a recorded. Naturally enough the penicillin content w very variable, and serial sputa from one patient woul often contain consistently more penicillin than di corresponding samples from another. But the gener trend on each dosage is clear, and the amounts of pen cillin remain surprisingly high for long periods afte inhalation. Although the Collison inhaler gave rathe the better results, the hand inhaler was also effective.

Penicillin in Blood and Urine after Single Inhalations.— Though our work was aimed primarily at studyin penicillin levels in the sputum, they confirmed inc dentally the observations of others that penicillin ca be detected in therapeutic concentrations in the bloo for 30–60 min. after inhalation of doses of 20,000–60,00 units, and that 10–30% of the dose given can be recovere from the urine.

CLINICAL APPLICATIONS

The aim of treatment was (1) to relieve bronchia spasm whenever it was a prominent symptom and thereb to facilitate penetration of the mist or aerosol; (2) t

University of London

As announced last week, Dr. N. Hamilton Fairley, F.R.S., has been appointed to the Wellcome chair of tropical medicine tenable at the London School of Hygiene and Tropical Medicine.

Dr. Hamilton Fairley qualified M.B., with first-class honours, at Melbourne in 1915. From 1916 to 1919 he was pathologist and later senior physician to the 14th Australian General Hospital in Egypt, where he was appointed O.B.E. in 1918. In 1920 he became assistant director of the Hall Research Institute, Melbourne Hospital, and from 1922 to 1926 he was Tata professor of tropical medicine, Bombay. In 1927 he took the D.SC. at Melbourne, and the following year he was elected F.R.C.P. From 1927 to 1929 he held a special appointment as Commonwealth research officer at the Hall Research Institute, and he was subsequently appointed assistant physician and director of pathology to the Hospital for Tropical Diseases, London. In 1931 he was awarded the Chalmers memorial medal for research in tropical medicine. Before the outbreak of war he was physician and director of special research to the Hospital for Tropical Diseases, London, and lecturer in tropical medicine at the London School of Hygiene and Tropical Medicine and the Westminster Hospital.

In 1940 he went to the Middle East as consulting physician to the 2nd A.I.F., and in 1940–41 acted as tropical consultant, headquarters, Middle East, to the British Forces, for which services he was appointed C.B.E. In 1942 he was elected F.R.S., and in the same year was appointed director of medicine, Australian Military Forces, with the rank of brigadier. From 1943 to 1946 he was also chairman of the advisory committee on tropical diseases, hygiene, and sanitation to General MacArthur at headquarters, South-west Pacific Area, and director, Land Headquarters medical research unit, Cairns, where researches of far-reaching military importance on the chemotherapeutic control of malaria by mepacrine, paludrine, and other antimalarial drugs were carried out on experimentally infected volunteers.

Dr. Hamilton Fairley is author of the section on tropical medicine in Price's *Textbook of Medicine*. His publications include original studies in the dentition and biting mechanism of colubrid snakes; new serological tests in helminthiasis, including the introduction of cercarial antigens in the diagnosis of mammalian schistosomiasis and scolex antigen in the diagnosis of hydatid disease; and the discovery and synthesis of the blood pigment, methæmalbumin, found in conditions like blackwater fever associated with intravascular hæmolysis and hæmoglobinuria.

University of Birmingham

As announced last week, Dr. J. M. Smellie has been appointed to the full-time chair of pædiatrics in the university.

Dr. Smellie qualified M.B. at Edinburgh in 1916. After holding an appointment as house-physician at Edinburgh Royal Infirmary, he joined the Royal Army Medical Corps, and served in Macedonia. On demobilisation, in 1920, he graduated M.D., and held posts as resident medical officer to the General Hospital, Birmingham, and assistant casualty officer to the Hospital for Sick Children, Great Ormond Street, London. He returned to Birmingham in 1922 when he was appointed physician to outpatients and pathologist to the Children's Hospital, and medical registrar and pathologist to the Queen's Hospital. In the same year he obtained the M.R.C.P. He was appointed assistant physician to the General Hospital in 1924, and consulting physician to the Royal Cripples Hospital in 1930. In 1932 he was elected F.R.C.P. He is an original member of the British Pædiatric Association and was on the executive committee from 1938 to 1940. Dr. Smellie served throughout the whole of the late war as an officer in the Territorial Army, and during the last twelve months was consulting physician, Eastern Command, India. He was appointed O.B.E. in 1944.

Dr. W. Melville Arnott who has been appointed to the full-time chair of medicine is 37 years of age.

He was educated at George Watson's College and the University of Edinburgh, where he gained the Grierson bursary in pathology and the Vans Dunlop scholarship in surgery and pathology, and qualified with honours in 1931. After various house-appointments, he devoted himself to clinical medicine combined with work in the university department of pathology, mainly on renal disease, with particular reference to experimental renal hypertension and experimental glomerulo-nephritis. In 1933 he became M.R.C.P.E., and the following year he graduated B.SC., with first-class honours in pathology. He held posts as clinical tutor in the Royal Infirmary, assistant physician in the Edinburgh municipal hospitals, lecturer in clinical medicine, and, from 1936, lecturer in therapeutics under Prof. D. M. Dunlop. In 1937 he was elected F.R.C.P.E., graduated M.D. with gold medal, and was awarded the Gunning prize in pathology. As a Territorial officer, he was mobilised on the outbreak of war, and spent five of six years' service overseas, as a medical specialist and officer-in-charge of medical divisions, with the rank of lieut.-colonel. He served in North China, Malaya, Ceylon, North Africa (including the siege of Tobruk), Palestine, and North-west Europe; he was awarded the Territorial Decoration and was mentioned in despatches. Since he was demobilised last year, he has been acting director of postgraduate medical studies in Edinburgh. In April he was elected assistant physician to Edinburgh Royal Infirmary

Mr. F. A. R. Stammers has been appointed to the full-time chair of surgery.

In the war of 1914–18 Mr. Stammers served for two years as a subaltern in the Royal Artillery. He graduated B.SC. at Birmingham in 1920, and M.B. three years later. After working as house-surgeon and resident surgical officer at Birmingham United Hospitals, resident medical officer at the Birmingham Children's Hospital, and demonstrator in anatomy in the university, he took the F.R.C.S. examination in 1925, and with a Rockefeller fellowship went to the United States, where he studied in the Mayo Clinic. In 1930 he was awarded the mastership of surgery (official). In the late war he served, for the first three years as officer-in-charge of surgical divisions in England and in West Africa, and for the second three years as consulting surgeon, with the rank of brigadier, to Western Command; and later to the Allied Armies in Italy; he was appointed O.B.E. mentioned in despatches. He is consulting surgeon to the Hospital, Birmingham, and honorary surgeon to the United pitals and the Children's Hospital, and is at present assis lecturer in clinical surgery at the university. Among his publications have been papers on peripheral vascular disord lymphogranuloma inguinale, delayed suture, and gas-gangrene.

Royal College of Surgeons of England

A meeting of the council was held on Aug. 1, with Sir Alf Webb-Johnson, the president, in the chair. Prof. G. Gr Turner was reappointed representative on the council King's College, Newcastle, for a further period of three yea Prof. D. T. Harris was elected an examiner in physiology, a Dr. Arthur Massey and Dr. William Blood examiners for th diploma in industrial health. Mr. L. Carnac Rivett wa invited to attend meetings of the council during the ensu year as the representative of gynæcology and obstetrics.

Diplomas in public health and of membership were grant to the candidates named in the report of the Royal Colle of Physicians in our issue of Aug. 3 (with the exception E. I. Bieber, J. R. Handforth, T. L. T. Lewis, and J. Sutherla who already hold the membership.)

A Research Consultant

Lady Florey has been appointed research consultant at the Central Middlesex County Hospital with an honorarium of £250 a year. She has been carrying out investigations at the hospital for some time past while holding a whole-time appointment with the Medical Research Council.

Operating Gowns

Private practitioners needing gowns for obstetrical work, treatment of venereal diseases, operations, or autopsies may now obtain coupon-equivalent certificates which will enable them to obtain six operating gowns. Practitioners in England and Wales should apply, stating particulars, to the Ministry of Health, Whitehall, London, S.W.1; in Scotland, to the Department of Health for Scotland, St. Andrew's House, Edinburgh; and in Northern Ireland, to the British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, enclosing a stamped addressed envelope.

Mr. Geoffrey Parker, D.S.O., has been made a chevalier of the Legion of Honour and awarded the croix-de-guerre with palm. Mr. Parker is surgeon to the French Hospital in London

OUR list of candidates successful in the Conjoint Board's examination for the D.T.M. & H. (June 29, p. 987) should have included the name of Air Commodore E. A. Lumley, M.B., D.P.H. The list as printed comprised only those who entered from the London School of Hygiene and Tropical Medicine.

Births, Marriages, and Deaths

BIRTHS

BAILY.—On July 30, in London, the wife of Surgeon Lieutenant R. A. J. BAILY, R.N.V.R.—a daughter.

BREARLEY.—On July 31, in London, the wife of Dr. B. F. Brearley—a daughter.

COMFORT.—On August 4, in London, the wife of Dr. Alex Comfort—a son.

GRETTON-WATSON.—On July 26, in London, the wife of Dr. B. G. Gretton-Watson—a son.

MACFARLANE.—On July 26, at Witney, the wife of Dr. R. G. Macfarlane—a son.

MORRIS.—On August 1, at Perth, the wife of Mr. E. W. T. Morr F.R.C.S., Sudan Medical Service—a son.

ROSS.—On July 29, in Edinburgh, the wife of Mr. James Ros M.B.E., F.R.C.S.E.—a son.

MARRIAGES

AGATE—PREEDY.—On July 26, at Spetisbury, John Norm Agate, M.R.C.P., to Rosemary Hester Preedy.

HOUSTON—CRUICKSHANK.—On August 15, in York, James Caldw Houston, M.D., M.R.C.P., to Thelma Cromarty Cruickshank, M.B.

RISK—SYMINGTON.—On July 23, at Glasgow, James Mc Symington Risk to Winifred Symington, M.B.

DEATHS

DEAS.—On July 28, at Morden, Surrey, Frank Deas, M.R.C.S. aged 77.

DREVER.—On July 22, at George, S. Africa, formerly of Beng James Croy Drever, M.B. Edin.

JAMESON.—On July 30, at West Wickham, Robert William Jameson, M.D. Brux., M.R.C.S., D.P.H., barrister-at-law, aged 74.

MACKIE.—On July 29, George Mackie, lieut.-colonel, D.S.O., O.B.E., M.D. Edin., of Malvern, aged 67.

MILNE.—On August 4, at New Barnet, Ernest Wardlaw Milne, M.B. Glasg., aged 70.

WACE.—On July 22, at Lansdowne, U.P., India, Michael Henr Wace, M.R.C.S., lieut.-colonel I.A.M.C.

ENICILLIN INHALATION IN PULMONARY DISEASE

J. H. Humphrey
M.B. Camb.
SSISTANT PATHOLOGIST

H. Joules
M.D. Lond., F.R.C.P.
MEDICAL DIRECTOR AND PHYSICIAN

CENTRAL MIDDLESEX COUNTY HOSPITAL

With the assistance of Muriel E. Smith

The object of the work described here was to find a suitable route, dose, and time interval for treatment with penicillin of chronic infections of the lungs and bronchi.

As the good effect of intramuscular treatment on lobar pneumonia has been in striking contrast to the poor results obtained in chronic conditions, it was decided to explore the possibilities of aerosol inhalations. A rational basis for treatment was first sought by comparing the concentrations of penicillin in sputum following similar doses given by two routes. The results of clinical application of a treatment based on these findings were next studied.

Penicillin in Sputum after Intramuscular Injection.—A technique was devised by which as little as $^{1}/_{48}$ unit of penicillin per c.cm. of sputum could be reliably estimated. It is described in the appendix, together with the precautions taken in collecting the sputum. Samples were obtained, during acute phases of their disease, from coöperative patients with plentiful sputum in whom the clinical diagnosis was beyond doubt. They were nearly all receiving three-hourly intramuscular injections of 15,000 units, but in three cases a single injection of 100,000 units was given and pooled sputum samples were examined during the next twelve hours. All samples covered periods of at least three hours, and some even twenty-four hours. On two occasions penicillin was detected in the sputum within three hours of the first injection. The results are given in table I.

TABLE I—PENICILLIN IN SPUTUM AFTER INTRAMUSCULAR INJECTION

Disease	Patients	Sputa	Penicillin not detected	Penicillin detected:	
				$^{1}/_{24}$–$^{1}/_{12}$ unit per c.cm.	$^{1}/_{6}$–$^{1}/_{3}$ unit per c.cm.
Lobar pneumonia	9	10	2	4	4
Lung abscess ..	3	19	18	1	0
Purulent bronchitis	3	4	4	0	0
Bronchiectasis ..	2	3	2	1	0

The number of samples was not large, but the implications were clear. Whereas significant amounts of penicillin were found in the majority of sputum samples from cases of lobar pneumonia, in lung abscess, chronic bronchitis, and bronchiectasis it was only occasionally detected.

A patient with an acute lobar pneumonia superimposed on chronic bronchitis and emphysema illustrated this point very well. He received three-hourly intramuscular injections of penicillin for a week, and his sputum was assayed for penicillin on different days. During his pneumonia samples contained $^{1}/_{24}$–$^{1}/_{6}$ unit per c.cm.; but, when it cleared and only the chronic bronchitis remained, no penicillin could be detected, though he continued to cough up considerable amounts of sputum.

Penicillin in Sputum after Single Inhalations.—Two types of apparatus for producing a mist were studied, both of which deliver a fine mist containing no droplets coarse enough to be visible to the naked eye.

The first was the 'Collison' inhaler already described by Mutch (1944), which is a robust instrument using compressed gas (usually oxygen) for nebulisation. In agreement with him it was found that most patients could comfortably inhale 5–8 litres a minute, and that the rate of delivery under these conditions was about 1·5 c.cm. of liquid nebulised from a single flask in a quarter of an hour. Patients were instructed to inhale through a mouth-piece and to breathe out through the nose. By reducing the volume of liquid in the flask so that the bulk of it was nebulised in any one experiment, changes in concentration of the residual penicillin solution due to simple evaporation were avoided as far as possible.

The second type of inhaler is typified by the 'Riddopag' or 'Rybar' inhalers, the first of which is illustrated in fig. 1. Such an inhaler can be worked either by a rubber hand-bulb or by compressed air generated by a small electric pump. It is much less robust and more liable to clog than the first type, but for outpatient use the hand inhaler has obvious advantages. The electric pump is more economical and more portable for ward use than are oxygen cylinders, which are heavy and need frequent replenishment. The practice with the hand type was to place 0·5 c.cm. of an aqueous solution of penicillin in the reservoir, and to instruct the patient to place the neck of the apparatus in his mouth and to inhale through his mouth as he squeezed the bulb. This was repeated until all the penicillin had been nebulised—usually 10–15 min.

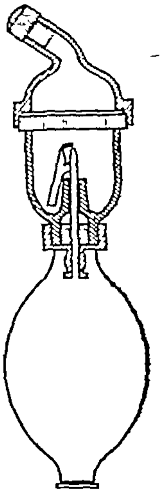


Fig. 1—Riddopag inhaler.

Coöperative patients were chosen, with a wide variety of lung diseases, including all those mentioned above. They mostly produced 50 c.cm. or more sputum a day, though a few produced less. After inhaling an approximately known dose of penicillin either from the Collison inhaler or the hand spray, their sputum was collected into cartons, which were changed each hour and sent immediately to the laboratory. Here they were kept frozen at −10° C until assayed for penicillin content.

The penicillin assay was not nearly so delicate as that used for sputum assay following intramuscular injection, nor was any extraction carried out. Only concentrations of 0·3 unit and over could be detected by this method. It consisted in placing a standard loopful of the well-mixed sputum sample on to a blood-agar plate which had been seeded with the Oxford strain of *Staph. aureus* in the usual way. The plate was examined after incubation at 37° C overnight, and the zones of inhibition were compared with those caused by known amounts of penicillin under similar conditions. No evidence of destruction of penicillin during testing was obtained with a number of control sputa. Fig. 2 shows plates with sputum assays on hourly samples taken from a man with silicosis and purulent bronchitis after being given 60,000 and 20,000 units of penicillin by inhalation. Fig. 3 shows the results of assays of 111 sputum samples set out in the form of a scatter diagram.

It was not always possible to obtain sputum within any given hourly period, but all sputa examined are recorded. Naturally enough the penicillin content was very variable, and serial sputa from one patient would often contain consistently more penicillin than did corresponding samples from another. But the general trend on each dosage is clear, and the amounts of penicillin remain surprisingly high for long periods after inhalation. Although the Collison inhaler gave rather the better results, the hand inhaler was also effective.

Penicillin in Blood and Urine after Single Inhalations.—Though our work was aimed primarily at studying penicillin levels in the sputum, they confirmed incidentally the observations of others that penicillin can be detected in therapeutic concentrations in the blood for 30–60 min. after inhalation of doses of 20,000–60,000 units, and that 10–30% of the dose given can be recovered from the urine.

CLINICAL APPLICATIONS

The aim of treatment was (1) to relieve bronchial spasm whenever it was a prominent symptom and thereby to facilitate penetration of the mist or aerosol; (2) to ensure good drainage of sputum, when this was possible; and (3) to maintain an adequate concentration of penicillin in the diseased parts throughout treatment.

Based on the above experimental findings, a routine has been evolved which gives a fair margin of safety in maintaining penicillin concentrations in the sputum and is not unduly wasteful. Before each period of inhalation, patients who can profit by postural drainage are drained for 15 min., and all patients are asked to clear their chests as far as possible. Patients with definite bronchial spasm are given one of the commercial antispasmodic inhalants such as 'Riddobron' or 'Rybarvin,' either for a few minutes before inhalation of penicillin with the Collison apparatus, or mixed with the penicillin with the hand apparatus. (Neither riddobron nor rybarvin destroyed penicillin significantly in the concentrations used when kept in contact for a few hours at room temperature.)

TABLE II—BACTERIA IN SPUTUM

Bacteria	Before treatment	Days after start of treatment					
		1–2	3–4	5–6	7–10	14	21–28
Pneumococci and/or streptococci and/or *Staph. aureus*..	26/26	12(18)*/33	4(7)/26	6(8)/28	3(5)/22	2/9	1/8
H. influenzæ ..	10/26	7/33	7/26	4/28	5/22	3/9	1/8
Coliform bacilli	3/26	13/33	18/26	25/28	20/22	7/9	7/8

Figures give the number of sputa containing specified organisms as a fraction of the number of samples examined for the given period.

Diphtheroid bacilli disappeared rapidly, and so did spirochætes when present. Monilia, *Micrococcus catarrhalis*, and in a few cases fusiform bacilli and bacteroides types persisted.

* Figures in parentheses give the number of sputa in which gram-stained films showed gram-positive cocci to be present. The figures not in parentheses give the number which grew on culture.

The routine differs somewhat for the two types of apparatus.

Collison Machine.—An aqueous solution of penicillin, 10,000 units per c.cm., is placed in one flask, and oxygen is passed through at 5–8 litres a minute. The patient inhales through a mouth-piece for 15 min. at four-hour intervals during the daytime, with a double period last thing at night to ensure bacteriostasis in the sputum until next morning. If the patient is too ill to manage a mouth-piece, a face mask can be used instead, though trial with a normal subject showed that less penicillin was recovered from the urine when the face mask was used than with the mouth-piece.

The dose of penicillin depends on the rate of oxygen flow, which is adjusted to be the most which the patient will tolerate comfortably, but it is usually about 1·5 c.cm. or 15,000 units—i.e., 90,000 units a day. Trials in which patients received only two periods of inhalation a day were followed in a few cases by recrudescence of symptoms, and with this dosage at least four inhalations a day seemed to be necessary. As mentioned above, antispasmodic inhalants are added if required.

Hand Inhaler.—A solution of penicillin, 20,000 units per c.cm., is used. This was originally made up in water, but lately 30% glycerin has been used as a solvent, since it provides a more enduring mist and does not dry up and clog the siphon so readily. (Care is needed in the choice of a batch of glycerin which has a neutral pH and does not inactivate penicillin.) Penicillin solution 0·5 c.cm. is placed in the reservoir, with or without an antispasmodic, and the patient is instructed to inhale the mist through his mouth until all has been nebulised.

The time-table is the same as for the Collison machine, the last dose being doubled as before (total dose 60,000 units daily). The hand inhaler has been used in this way for the treatment of outpatients, and, with a face mask and attached to an electric pump, for inpatients also. Inpatients received 1 c.cm. of penicillin solution at each inhalation period. It was considered advisable in certain cases to continue treatment as outpatients with the hand inhaler for up to two months, though it was expensive of penicillin.

An analysis is presented of 80 cases which have been treated with penicillin in one or other of these ways. Of these, 72 were ill enough to require treatment in hospital initially, and most were severely ill. The majority had already received courses of sulphonamides or of penicillin intramuscularly (three-hourly injections of 15,000 units), with only partial improvement or no improvement at all. The distribution of cases is given in table III. Of these, the first 26 were chosen for careful bacteriological study, and their diseases included 6 cases of bronchiectasis, 4 of lung abscess, 14 with severe exacerbation of chronic bronchitis (of which 8 had asthma), and 2 of purulent bronchiolitis. Treatment lasted 1–10 weeks.

RESULTS

Bacteriological Results.—The effect most easily studied has been on the bacterial content of the sputum. This has been followed by examination of serial films and aerobic cultures of sputa taken at intervals of one or two days from inpatients and weekly from outpatients. The results are presented in table II, which has been greatly compressed and shows only the change in incidence of the commoner organisms as treatment proceeded.

The most notable features are the rapid disappearance of gram-positive cocci, and the appearance of coliform bacilli in nearly all sputa. (The latter may be in part an unmasking effect, whereby scanty bacilli are seen more easily in films and grow more readily in cultures when other organisms are suppressed, but from the examination of films there seemed to be in part a true increase in incidence and numbers.) After four days pneumococci, streptococci, and staphylococci had disappeared from the sputa of all except three patients, and in these there was usually an obvious reason for persistence, such as continued breaking down of a loculated or multiple lung abscess. Staphylococci disappeared within two days in two cases of purulent bronchiolitis which had not improved clinically nor shown any change in bacteriology of the sputum after five and seven days on intramuscular penicillin (120,000 units a day), and in one of which the infecting *Staph. aureus* was six times as resistant to penicillin as was the standard strain.

TABLE III—CLINICAL RESPONSE IN 80 CASES TREATED BY PENICILLIN INHALATIONS

Condition	No. of cases	Much improved	Improved	Not improved
Chronic bronchitis + spasm ± acute exacerbation ..	20	15	5	0
Bronchiectasis	18	12	4	2
Respiratory infection with congestive heart-failure ..	15	7	4	4
Pneumonia and generalised bronchitis	11	7	4	0
Lung abscess	5	3	0	2
Suppurative pneumonitis ..	4	0	0	4
Silicosis + bronchitis	3	2	0	1
Atypical pneumonia ..	4	0	0	4
Total	80	46	17	17

Subsequent studies have in general confirmed these early observations, but have revealed further cases in which sputa containing organisms resistant to penicillin have remained unaffected by the treatment. They include *B. proteus*, *Ps. pyocyanea*, and resistant strains of *H. influenzæ* and *H. para-influenzæ*.

Clinical Results.—Patients said that their cough became easier and less frequent within one or two days of starting treatment. This decrease was their greatest relief. (Such a relief is not symptomatic only, but also removes a major factor in the development of cor pulmonale.) One man, with a long-standing history of bronchiectasis, who had improved remarkably on outpatient treatment volunteered the information that he ould now climb three flights of stairs comfortably, whereas previously a single flight had caused him distress.

In most cases the *sputum* gradually diminished in amount and became mucoid instead of purulent. Persistence of purulent sputum, notwithstanding diminution in amount, appeared to be associated with the presence of large numbers of *H. influenzæ* in one case, of fusiform bacilli and *H. influenzæ* in another, and of monilia and *H. influenzæ* in a third. The presence of coliform organisms, which never appeared in numbers comparable with those of *H. influenzæ* or of gram-positive cocci in the infected sputa, was not associated with pus or sputum formation to the same degree as were those other bacteria. Nevertheless their rôle in maintaining sputum secretion certainly cannot be discounted. Foul odour disappeared within a few days, though fusiform bacilli could still be found in stained films and the volume of sputum in putrid lung abscesses did not always diminish. Only a third of those patients who responded to treatment were free of sputum on discharge, and the majority, especially those with chronic bronchitis, still produced up to 25 c.cm. of sputum, mainly in the early morning, but were not greatly troubled by it.

Table III shows the results of treatment of different types of case. Our criteria of "much improved" were subsidence of all acute changes and signs of toxæmia, together with very marked or complete reduction of cough and of the amount of sputum, while those for "improved" were subsidence of acute changes and signs of toxæmia, with definite diminution of cough. The sputum in these cases was rendered much more mucoid and less purulent, but was only moderately diminished in amount. In making this assessment we have tried to allow for improvement attributable to the various other forms of therapy which most of the patients had also had, basing ourselves upon previous experience with these diseases in our wards.

Pyrexia in acute bronchitis and bronchiectasis with peribronchitis subsided rapidly and sometimes dramatically, but more slowly in lung abscess and purulent bronchiolitis (taking those cases which responded only).

When *asthma* was associated with acute bronchitis it improved pari passu with the bronchitis, often to a striking extent.

Shortness of breath, which is correlated with greatly diminished vital capacity, was much relieved in those patients with congestive cardiac failure and respiratory infection who responded to treatment. In this group four patients died in hospital with cardiac failure, but the degree of cor pulmonale found at necropsy was so great that death appeared to have been inevitable.

All surviving patients showed much improvement *radiologically*, with subsidence of the acute changes. In certain cases, however, such as those of atypical pneumonia (which were included to provide some sort of controls), the radiological improvement could not be ascribed to penicillin inhalations.

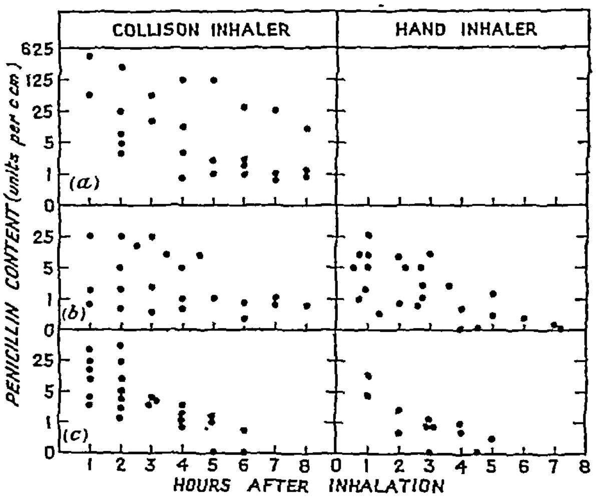


Fig. 3—Penicillin content of 111 samples of sputum after inhalation of penicillin, with two types of inhaler: (a) after inhalation of 50,000–100,000 units; (b) after inhalation of 15,000–30,000 units; (c) after inhalation of 5000–15,000 units.

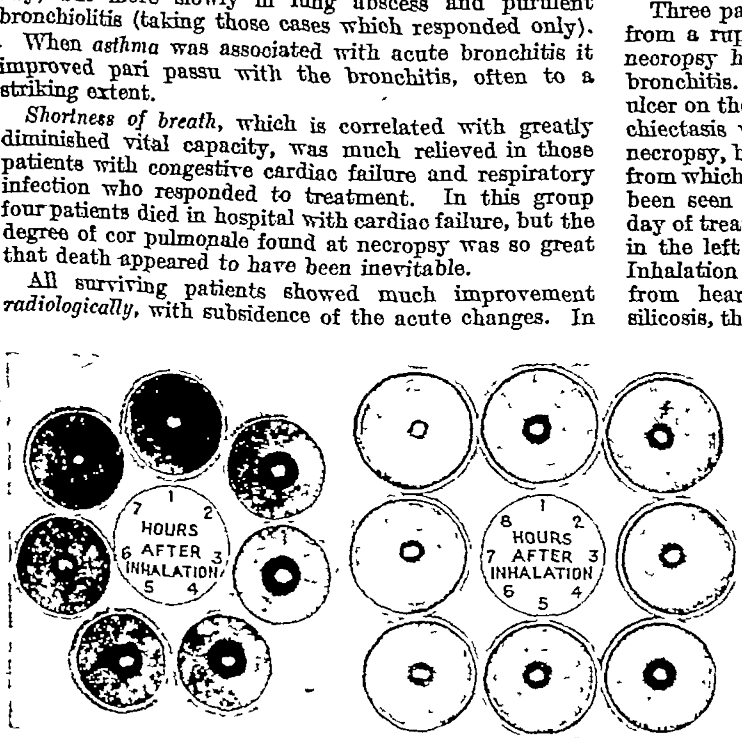
Serial *white-cell counts* and estimations of *erythrocyte-sedimentation rate* were made in 42 cases. As the clinical condition improved, they also returned towards normal.

Recurrence of acute infections within three weeks of discharge during the period of cold weather followed in two patients, before treatment was continued as out-patients with the hand inhaler. Further work is required to decide how far continued treatment is necessary, but in view of a tendency to early relapse, shown by patients with bronchiectasis particularly, we have continued outpatient treatment in certain cases for periods up to three months.

Three patients died early during treatment. One died from a ruptured aortic aneurysm on the fifth day. At necropsy he had extensive bronchiectasis and purulent bronchitis. The second died from a bleeding duodenal ulcer on the seventh day. He showed only localised bronchiectasis with very little surrounding inflammation at necropsy, but the dilated small bronchi still contained pus from which pneumococci were recovered, though none had been seen in stained films of sputum after the second day of treatment. The third developed a mural thrombus in the left auricle six days after treatment was begun. Inhalation was stopped, and he died three days later from heart-failure. At necropsy, besides advanced silicosis, there was extensive chronic bronchitis, with consolidation of an early bronchopneumonia at the bases. The bronchopneumonia was presumably a terminal phenomenon.

Two other patients in this series died from suppurative bronchiolitis. Their histories and pathological findings are given in detail, since they represent a type of case which would not have been met with but for penicillin therapy, by which they were prevented from early death due to overwhelming infection with gram-positive cocci. We consider that they were similar to a case of suppurative bronchiolitis described by Durant et al. (1946) and successfully treated by them with intrabronchial streptomycin.

CASE 1.—A man, aged 35, had had bronchopneumonia at the age of 12 years, bilateral antral disease at the age of 20, and bronchopneumonia at the age of 30. His present illness had begun four weeks before admission, with



(a) (b)

Fig. 2—Blood-agar plates showing zones of inhibition of Oxford *Staph. aureus* by penicillin in sputum from a case of silicosis and purulent bronchitis: (a) after inhalation of 60,000 units; (b) after inhalation of 20,000 units.

ensure good drainage of sputum, when this was possible; and (3) to maintain an adequate concentration of penicillin in the diseased parts throughout treatment.

Based on the above experimental findings, a routine has been evolved which gives a fair margin of safety in maintaining penicillin concentrations in the sputum and is not unduly wasteful. Before each period of inhalation, patients who can profit by postural drainage are drained for 15 min., and all patients are asked to clear their chests as far as possible. Patients with definite bronchial spasm are given one of the commercial antispasmodic inhalants such as 'Riddobron' or 'Rybarvin,' either for a few minutes before inhalation of penicillin with the Collison apparatus, or mixed with the penicillin with the hand apparatus. (Neither riddobron nor rybarvin destroyed penicillin significantly in the concentrations used when kept in contact for a few hours at room temperature.)

TABLE II—BACTERIA IN SPUTUM

Bacteria	Before treatment	Days after start of treatment					
		1–2	3–4	5–6	7–10	14	21–28
Pneumococci and/or streptococci and/or *Staph. aureus*..	26/26	12(18)*/33	4(7)/26	6(8)/28	3(5)/22	2/9	1/8
H. influenzæ ..	10/26	7/33	7/26	4/28	5/22	3/9	1/8
Coliform bacilli	3/26	13/33	18/26	25/28	20/22	7/9	7/8

Figures give the number of sputa containing specified organisms as a fraction of the number of samples examined for the given period.

Diphtheroid bacilli disappeared rapidly, and so did spirochætes when present. Monilia, *Micrococcus catarrhalis*, and in a few cases fusiform bacilli and bacteroides types persisted.

* Figures in parentheses give the number of sputa in which gram-stained films showed gram-positive cocci to be present. The figures not in parentheses give the number which grew on culture.

The routine differs somewhat for the two types of apparatus.

Collison Machine.—An aqueous solution of penicillin, 10,000 units per c.cm., is placed in one flask, and oxygen is passed through at 5–8 litres a minute. The patient inhales through a mouth-piece for 15 min. at four-hour intervals during the daytime, with a double period last thing at night to ensure bacteriostasis in the sputum until next morning. If the patient is too ill to manage a mouth-piece, a face mask can be used instead, though trial with a normal subject showed that less penicillin was recovered from the urine when the face mask was used than with the mouth-piece.

The dose of penicillin depends on the rate of oxygen flow, which is adjusted to be the most which the patient will tolerate comfortably, but it is usually about 1·5 c.cm. or 15,000 units—i.e., 90,000 units a day. Trials in which patients received only two periods of inhalation a day were followed in a few cases by recrudescence of symptoms, and with this dosage at least four inhalations a day seemed to be necessary. As mentioned above, antispasmodic inhalants are added if required.

Hand Inhaler.—A solution of penicillin, 20,000 units per c.cm., is used. This was originally made up in water, but lately 30% glycerin has been used as a solvent, since it provides a more enduring mist and does not dry up and clog the siphon so readily. (Care is needed in the choice of a batch of glycerin which has a neutral pH and does not inactivate penicillin.) Penicillin solution 0·5 c.cm. is placed in the reservoir, with or without an antispasmodic, and the patient is instructed to inhale the mist through his mouth until all has been nebulised.

The time-table is the same as for the Collison machine, the last dose being doubled as before (total dose 60,000 units daily). The hand inhaler has been used in this way for the treatment of outpatients, and, with a face mask and attached to an electric pump, for inpatients also. Inpatients received 1 c.cm. of penicillin solution at each inhalation period. It was considered advisable in certain cases to continue treatment as outpatients with the hand inhaler for up to two months, though it was expensive of penicillin.

An analysis is presented of 80 cases which have been treated with penicillin in one or other of these ways. Of these, 72 were ill enough to require treatment in hospital initially, and most were severely ill. The majority had already received courses of sulphonamides or of penicillin intramuscularly (three-hourly injections of 15,000 units), with only partial improvement or no improvement at all. The distribution of cases is given in table III. Of these, the first 26 were chosen for careful bacteriological study, and their diseases included 6 cases of bronchiectasis, 4 of lung abscess, 14 with severe exacerbation of chronic bronchitis (of which 8 had asthma), and 2 of purulent bronchiolitis. Treatment lasted 1–10 weeks.

RESULTS

Bacteriological Results.—The effect most easily studied has been on the bacterial content of the sputum. This has been followed by examination of serial films and aerobic cultures of sputa taken at intervals of one or two days from inpatients and weekly from outpatients. The results are presented in table II, which has been greatly compressed and shows only the change in incidence of the commoner organisms as treatment proceeded.

The most notable features are the rapid disappearance of gram-positive cocci, and the appearance of coliform bacilli in nearly all sputa. (The latter may be in part an unmasking effect, whereby scanty bacilli are seen more easily in films and grow more readily in cultures when other organisms are suppressed, but from the examination of films there seemed to be in part a true increase in incidence and numbers.) After four days pneumococci, streptococci, and staphylococci had disappeared from the sputa of all except three patients, and in these there was usually an obvious reason for persistence, such as continued breaking down of a loculated or multiple lung abscess. Staphylococci disappeared within two days in two cases of purulent bronchiolitis which had not improved clinically nor shown any change in bacteriology of the sputum after five and seven days on intramuscular penicillin (120,000 units a day), and in one of which the infecting *Staph. aureus* was six times as resistant to penicillin as was the standard strain.

TABLE III—CLINICAL RESPONSE IN 80 CASES TREATED BY PENICILLIN INHALATIONS

Condition	No. of cases	Much improved	Improved	Not improved
Chronic bronchitis + spasm ± acute exacerbation ..	20	15	5	0
Bronchiectasis	18	12	4	2
Respiratory infection with congestive heart-failure ..	15	7	4	4
Pneumonia and generalised bronchitis	11	7	4	0
Lung abscess	5	3	0	2
Suppurative pneumonitis ..	4	0	0	4
Silicosis + bronchitis	3	2	0	1
Atypical pneumonia ..	4	0	0	4
Total	80	46	17	17

Subsequent studies have in general confirmed these early observations, but have revealed further cases in which sputa containing organisms resistant to penicillin have remained unaffected by the treatment. They include *B. proteus*, *Ps. pyocyanea*, and resistant strains of *H. influenzæ* and *H. para-influenzæ*.

Clinical Results.—Patients said that their cough became easier and less frequent within one or two days of starting treatment. This decrease was their greatest relief. (Such a relief is not symptomatic only, but also removes a major factor in the development of cor pulmonale.) One man, with a long-standing history of bronchiectasis, who had improved remarkably on outpatient treatment volunteered the information that he ould now climb three flights of stairs comfortably, whereas previously a single flight had caused him distress.

In most cases the *sputum* gradually diminished in amount and became mucoid instead of purulent. Persistence of purulent sputum, notwithstanding diminution in amount, appeared to be associated with the presence of large numbers of *H. influenzæ* in one case, of fusiform bacilli and *H. influenzæ* in another, and of monilia and *H. influenzæ* in a third. The presence of coliform organisms, which never appeared in numbers comparable with those of *H. influenzæ* or of gram-positive cocci in the infected sputa, was not associated with pus or sputum formation to the same degree as were those other bacteria. Nevertheless their rôle in maintaining sputum secretion certainly cannot be discounted. Foul odour disappeared within a few days, though fusiform bacilli could still be found in stained films and the volume of sputum in putrid lung abscesses did not always diminish. Only a third of those patients who responded to treatment were free of sputum on discharge, and the majority, especially those with chronic bronchitis, still produced up to 25 c.cm. of sputum, mainly in the early morning, but were not greatly troubled by it.

Table III shows the results of treatment of different types of case. Our criteria of "much improved" were subsidence of all acute changes and signs of toxæmia, together with very marked or complete reduction of cough and of the amount of sputum, while those for "improved" were subsidence of acute changes and signs of toxæmia, with definite diminution of cough. The sputum in these cases was rendered much more mucoid and less purulent, but was only moderately diminished in amount. In making this assessment we have tried to allow for improvement attributable to the various other forms of therapy which most of the patients had also had, basing ourselves upon previous experience with these diseases in our wards.

Pyrexia in acute bronchitis and bronchiectasis with peribronchitis subsided rapidly and sometimes dramatically, but more slowly in lung abscess and purulent bronchiolitis (taking those cases which responded only).

When *asthma* was associated with acute bronchitis it improved pari passu with the bronchitis, often to a striking extent.

Shortness of breath, which is correlated with greatly diminished vital capacity, was much relieved in those patients with congestive cardiac failure and respiratory infection who responded to treatment. In this group four patients died in hospital with cardiac failure, but the degree of cor pulmonale found at necropsy was so great that death appeared to have been inevitable.

All surviving patients showed much improvement *radiologically*, with subsidence of the acute changes. In certain cases, however, such as those of atypical pneumonia (which were included to provide some sort of controls), the radiological improvement could not be ascribed to penicillin inhalations.

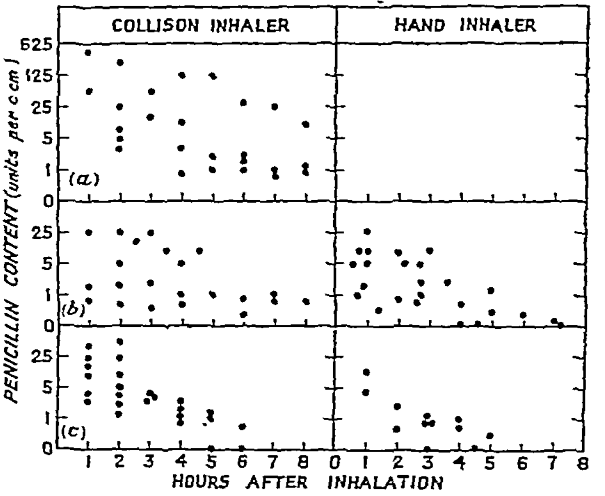
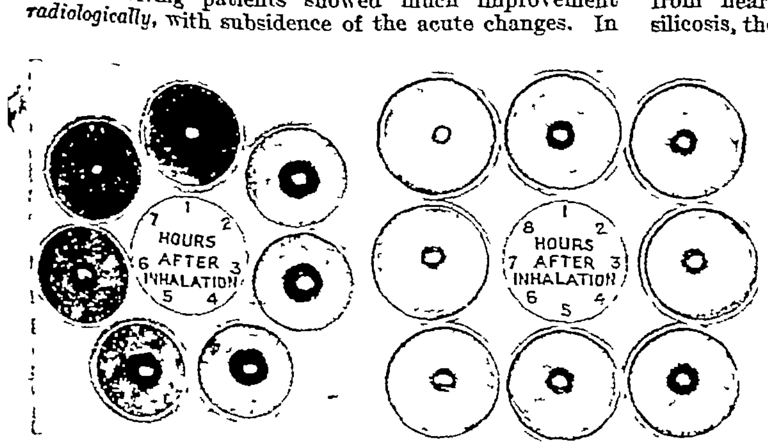


Fig. 3—Penicillin content of 111 samples of sputum after inhalation of penicillin, with two types of inhaler: (a) after inhalation of 50,000–100,000 units; (b) after inhalation of 15,000–30,000 units; (c) after inhalation of 5000–15,000 units.



(a) (b)

Fig. 2—Blood-agar plates showing zones of inhibition of Oxford Staph. aureus by penicillin in sputum from a case of silicosis and purulent bronchitis: (a) after inhalation of 60,000 units; (b) after inhalation of 20,000 units.

Serial *white-cell counts* and estimations of *erythrocyte-sedimentation rate* were made in 42 cases. As the clinical condition improved, they also returned towards normal.

Recurrence of acute infections within three weeks of discharge during the period of cold weather followed in two patients, before treatment was continued as outpatients with the hand inhaler. Further work is required to decide how far continued treatment is necessary, but in view of a tendency to early relapse, shown by patients with bronchiectasis particularly, we have continued outpatient treatment in certain cases for periods up to three months.

Three patients died early during treatment. One died from a ruptured aortic aneurysm on the fifth day. At necropsy he had extensive bronchiectasis and purulent bronchitis. The second died from a bleeding duodenal ulcer on the seventh day. He showed only localised bronchiectasis with very little surrounding inflammation at necropsy, but the dilated small bronchi still contained pus from which pneumococci were recovered, though none had been seen in stained films of sputum after the second day of treatment. The third developed a mural thrombus in the left auricle six days after treatment was begun. Inhalation was stopped, and he died three days later from heart-failure. At necropsy, besides advanced silicosis, there was extensive chronic bronchitis, with consolidation of an early bronchopneumonia at the bases. The bronchopneumonia was presumably a terminal phenomenon.

Two other patients in this series died from suppurative bronchiolitis. Their histories and pathological findings are given in detail, since they represent a type of case which would not have been met with but for penicillin therapy, by which they were prevented from early death due to overwhelming infection with gram-positive cocci. We consider that they were similar to a case of suppurative bronchiolitis described by Durant et al. (1946) and successfully treated by them with intrabronchial streptomycin.

CASE 1.—A man, aged 35, had had bronchopneumonia at the age of 12 years, bilateral antral disease at the age of 20, and bronchopneumonia at the age of 30. His present illness had begun four weeks before admission, with coryza, cough, dyspnœa, sore throat, and sweating. There had been a gradual increase of purulent sputum. A full course of sulphathiazole had been given at onset of illness, with no apparent benefit.

On admission he was moderately ill, temperature 102·6° F, pulse-rate 120, respirations 32 per min. Fœtor oris was well marked. Purulent sputum 4–6 oz. daily. Physical signs in chest suggested multiple areas of bronchopneumonia and cavitation throughout lower two-thirds of both lungs. Sputum culture grew *Staph. aureus* and *H. influenzæ.*

Intramuscular penicillin, 15,000 units three-hourly, with penicillin inhalation four-hourly, produced a temporary improvement in general condition, with a fall of temperature, and sputum ceased to grow *Staph. aureus*; but *H. influenzæ* became much more numerous. Four days later, despite continued treatment, the patient relapsed, sputum increased, and temperature rose steadily. Radiography suggested multiple small cavities in lower half of both lungs. Death ensued seventy days after the start of illness. Sputum had remained purulent throughout, and in later weeks a pure growth of *H. influenzæ* was recorded on many occasions.

Necropsy confirmed the presence of a generalised acute bronchiectasis, together with an acute purulent tracheobronchitis. Swabs taken from the dilated terminal bronchi grew *H. influenzæ* alone, which were agglutinated by patient's serum taken ten days before death in dilutions up to 1 in 80.

CASE 2.—A man, aged 28, had had a similar clinical and bacteriological course in hospital, following admission for an illness which had lasted for only two days and which at the outset suggested atypical pneumonia, with cold agglutinins present in the serum in dilutions up to 1 in 800. Added infection took place mainly with hæmolytic streptococcus and *H. influenzæ*. The former were cleared from the sputum by penicillin inhalation, but the latter were present in pure culture for the last two weeks of a fatal illness lasting thirty-four days.

Necropsy showed an acute tracheobronchitis and bronchiolitis, together with an acute bronchiectasis. *H. influenzæ*, isolated from the lungs in pure culture after death, were gglutinated by patient's serum taken eight days previously n dilutions up to 1 in 20.

One woman, with a similar history, and with clinical and pathological findings akin to the two cases above, but generally milder, responded to penicillin inhalations and eventually recovered completely. Physical signs suggested an acute bronchiectasis at the height of infection. Subsequent 'Lipiodol' injections showed that there was no residual lesion.

Results of Pre- and Post-operative Treatment.—In 18 cases treated since August, 1945, in which penicillin inhalations were used before and after pneumonectomy or lobectomy for carcinoma of the lung or bronchiectasis, 2 have developed small bronchopleural fistulæ. This figure can be compared with an earlier similar series of 15 cases where penicillin was instilled into the pleural space at operation, and in which 5 cases developed fistulæ. Before penicillin was used, of 22 patients operated on by the same surgeon, 13 subsequently developed fistulæ.

DISCUSSION

Though the concentrations found in sputa provided a definite indication for using penicillin as an aerosol in the chronic infections described, the clinical effectiveness was less readily proved. Treatment by this route has also been indicated by various authors primarily interested in the absorption and excretion of the drug. Mutch and Rewell (1945) and Knott and Clark (1945) have shown that considerable amounts of penicillin appear in the blood and urine of normal persons inhaling a penicillin mist. Detailed papers by Barach et al. (1945), Olsen and Clagett (1945), and Hagen et al. (1945) have discussed the absorption and use of penicillin in aerosol in certain chronic and subacute pulmonary conditions, and Vermilye (1946) has described its use in general practice for the treatment of various infections of the upper respiratory tract.

It might be argued that, when lung disease is localised, as in lung abscess and in bronchiectasis, the affected part has a relatively poor air entry, and the penicillin will be deposited almost entirely in the healthy bronchioles and alveoli. The fact that in normal patients penicillin can be detected in the blood and is excreted in the urine within a few minutes of administration of the mist is strong evidence of rapid absorption from healthy alveoli. Many of the cases studied, however, had localised lesions in the lung (including a case of isolated upper-lobe bronchiectasis), and the sputum presumably came from these rather than from healthy parts, yet it contained detectable amounts of penicillin for as long as eight hours after administration. The most likely explanation is that penicillin mist or aerosol does reach the diseased parts, and that it dissolves in the mucus or pus which lies there, and is only slowly absorbed from these sites. This is an important point in therapy.

It is a considerable criticism of this investigation that no control series was studied, nor could old records be used for the purpose satisfactorily, since the time spent in hospital and the degree of improvement required before discharge have depended considerably on the pressure on available beds, which has been particularly acute during the period of study. In compiling table III, therefore, we have been as critical as we could, and have relied whenever possible on objective rather than subjective criteria of improvement. We feel satisfied that penicillin inhalation as administered has proved its value in two types of case particularly: chronic bronchitis with spasm (with or without acute exacerbation), and congestive cardiac failure brought on or made worse by respiratory infections. Patients with pneumonia whose general lung infection has been improved by systemic chemotherapy but who were left with a relatively intractable bronchitis and peribronchitis were also speeded in recovery. Similarly, patients with pulmonary tuberculosis (not included in the table) whose cough was aggravated by superadded non-tuberculous bronchit were much relieved of their most troublesome sympton without any ill effect upon the underlying tuberculos being apparent. Most patients with bronchiectasis wer benefited, but in nearly all the sputum was not abolishe It remains to be seen whether streptomycin given b inhalation would be more successful by eliminating th infection with coliform and other penicillin-resistar organisms. The rapid improvement noted in som patients may be due in part to psychological reason —for administration of a mist has a straightforwar common-sense appeal to them—and in certain case the frequent postural drainage and deeper respiratior during treatment have also played their part. But th most telling argument is the change in quantity, qualit and bacterial content of the sputum.

Certain considerations have always to be remembere First, there are patients with bronchiectasis, &c., who infecting organisms are insensitive to penicillin even the high concentrations obtainable locally by inhal tion. We have met 8 such, since this study was mad and they showed no response to treatment either clinicall or bacteriologically. Secondly, as the necropsies showe in the early days at any rate, the sputum may be fr from pyogenic cocci, and yet these cocci can be found the infected small bronchi. It is not justifiable to assun that inhaled penicillin will diffuse through the secretio to the infected surfaces, unless the amount of secretion is kept down by adequate removal (either by coughing or by postural drainage). Neither can penicillin inhalation be discontinued solely on the evidence that a single sputum sample contains no pyogenic cocci, but rather must the clinical condition and the evidence of successive sputum examinations be taken into account. None of our cases was treated for less than five days, and most required considerably longer if early relapse was to be prevented. Outpatient treatment has numerous technical snags, but the work described here demonstrates that treatment can be begun or continued in this way, with the result that patients have been able to leave hospital sooner than they otherwise would have done, and have been able to return to work instead of lying up at home.

It is difficult to say yet whether any permanent improvement is likely to be effected by continued or repeated treatment of long-standing cases of chronic bronchitis with emphysema or of bronchiectasis. The persistence of mucoid sputum is bound up with the structure of the chronically inflamed bronchi and bronchioles. They are usually lined with a complete epithelium, and the walls contain numerous mucin-secreting glands. Beneath the epithelium is a layer, more or less thick, of fibrous tissue which is highly vascular and infiltrated chiefly with plasma cells and lymphocytes. It would be very optimistic to suppose that such glands will regress, or that an epithelised cavity will alter much, even though pyogenic infection be permanently staved off and no further fibrosis take place.

In our view treatment with inhaled penicillin alone may speed up a permanent cure in lung abscess, purulent bronchiolitis, &c., which have not become chronic, but in the really chronic conditions it will only arrest acute (and sometimes fatal) exacerbations and prevent the steady deterioration which each winter season brings. As a preoperative and postoperative treatment for lobectomy, however, or when a patient with a known bronchiectasis or chronic bronchitis has to undergo an abdominal operation, penicillin inhalation has many advantages.

SUMMARY

In chronic pulmonary infections penicillin given in three-hourly intramuscular doses of 15,000 units is not as a rule found in the sputum in significant concentrations. In lobar pneumonia the sputum may contain $^1/_{24}$–$^1/_2$ unit per c.cm.

Penicillin administered as a fine mist or aerosol can be detected in the sputum for six hours or more after inhalation of a single dose of 15,000 units. The exact time varies with the dose inhaled.

Methods of administration to inpatients and to outpatients are described which have been used in subacute and chronic pulmonary infections.

As a result, gram-positive cocci are rapidly eliminated from the sputum in most cases, and coliform bacilli appear in nearly all. The sputum diminishes in amount and becomes mucoid, and clinical improvement is the rule.

When the sputum initially contained penicillin-insensitive pathogenic organisms, neither alteration in character nor clinical improvement was noted.

In an analysis of 80 cases treated in this way it was found that 46 were much improved and 17 moderately improved. Whereas recovery from acute and subacute conditions which responded to treatment was usually complete, the more chronic cases were relieved but not permanently cured. Preoperative and postoperative treatment of patients with chronic pulmonary infection submitted to operation was associated with a very low complication-rate.

APPENDIX

Estimation of Penicillin in Sputum.—Small concentrations of penicillin can at present only be estimated by test-tube or slide-cell methods. Sputum for this purpose has the disadvantages that it is both heavily contaminated with bacteria and difficult to dilute owing to its great viscosity. By extracting the penicillin quantitatively into sterile aqueous solution these snags can be overcome. The following method is based on that of Berger (1944) for concentrating penicillin from culture media.

By adding 40% of ammonium sulphate to the sputum at pH 5·5–6·5 the mucin is coagulated (which greatly aids subsequent extraction), and the solubility of penicillin is depressed sufficiently to make it almost quantitatively extractable by amyl acetate at the pH at which it is most stable. The amyl acetate extract is free from bacteria, and from it penicillin can be extracted back with weak alkali, which is rapidly neutralised, and used for slide-cell estimations in the ordinary way. Our procedure is as follows:

Sputum, collected over a known period of time and taken to the laboratory immediately after, is kept frozen at −10° C until tested. All tests have been made within two days of collection. A known volume (1–3 c.cm.) in a graduated centrifuge tube is made up to 3 c.cm. with distilled water, and 1·2 g. of ammonium sulphate is added from a calibrated spoon. If necessary the pH is adjusted to 5·5–6·0, but in our experience the sputum has always been slightly acid and adjustment has not been needed. Without delay 3 c.cm. of amyl acetate is added, and the tube is well shaken. After the amyl acetate has been centrifuged and removed to another centrifuge tube, the extraction is repeated with a further 3 c.cm. of amyl acetate. The combined extracts are shaken with 0·75 c.cm. of freshly prepared 1% sodium bicarbonate solution and centrifuged briefly. The bicarbonate layer is cautiously removed with a Pasteur pipette to a small sterile tube, and to it is added immediately 0·25 c.cm. of *M*/1 acetate buffer at pH 5. The final pH is 7, and the final volume 1 c.cm. Penicillin in the final extract is assayed by serial twofold dilutions in sterile normal serum (beginning at 1 : 2) in slide cells, the Oxford standard strain of *Staph. aureus* being used as test organism.

By using different final volumes of extract any desired degree of concentration can be obtained. Though recovery of penicillin from aqueous solution was virtually complete, from sputum it was often only 70–80%, but this was adequate for our purpose. By the technique described above penicillin added to sputum to give a concentration of $^1/_{45}$ unit per c.cm. could be estimated satisfactorily. Control tuberculous sputa did not contain any bacteriostatic substances extractable by this method.

We are indebted to the doctors and nurses of the hospital for their collaboration; Mr. L. Fatti for the statistics of bronchopleural fistula after operation; Dr. R. D. Teare for his necropsy report on one case; and Lady Florey for advice in preparing the manuscript. The electric pump used was a 'Pneumostat,' kindly lent by Messrs. Riddell Products Ltd., London, W.1.

REFERENCES

Barach, A. L., Silberstein, F. H., Oppenheimer, E. T., Hunter, T. H., Soroka, M. (1945) *Ann. intern. Med.* **22**, 485.
Berger, E. M. (1944) *Nature, Lond.* **154**, 459.
Durant, T. M., Sokalchuk, A. J., Norris, C. M., Brown, C. L. (1946) *J. Amer. med. Ass.* **131**, 194.
Hagen, E. W., Karp, M., Farmer, C. J. (1945) *Arch. Otolaryngol.* **41**, 333.
Knott, F. A., Clark, W. H. (1945) *Lancet*, i, 468.
Mutch, N. (1944) *Ibid*, ii, 775.
— Rewell, R. E. (1945) *Ibid*, i, 650.
Olsen, A. M., Clagett, O. T. (1945) *Proc. Mayo Clin.* **20**, 184.
Vermilye, H. N. (1945) *J. Amer. med. Ass.* **129**, 250.

INHALED PENICILLIN IN BRONCHIAL INFECTIONS

NEVILLE SOUTHWELL
M.A., M.B. Camb., M.R.C.P.
MEDICAL TUTOR AND MEDICAL REGISTRAR, GUY'S HOSPITAL, LONDON

THE experimental work of Mutch and Hoskins (1944), Mutch and Rewell (1945), and Knott and Clark (1945) in this country, and Barach et al. (1945) in the United States, has shown that it is possible to inhale penicillin safely and obtain a therapeutic level in the blood. Further, Knott and Southwell (1946) have demonstrated in rabbits, by simultaneous estimation, that the blood-penicillin level is relatively much higher in the pulmonary than in the systemic circuit. Apart from the treatment of acute pulmonary infections, it has been suggested (Vermilye 1945) that the topical effect of inhaled penicillin is favourable in chronic bronchial infections.

The present cases have been treated in the asthma clinic at Guy's Hospital since September, 1945.

METHOD

The four nebulisers used were of the Collison and Spiess-Dräger patterns, in both of which the mist is delivered by oxygen pressure and conducted by wide tubing to a B.L.B. mask closely attached to the face—the apparatus devised by Mutch and Hoskins. Calcium penicillin in saline solution was used, in a strength of coryza, cough, dyspnœa, sore throat, and sweating. There had been a gradual increase of purulent sputum. A full course of sulphathiazole had been given at onset of illness, with no apparent benefit.

On admission he was moderately ill, temperature 102·6° F, pulse-rate 120, respirations 32 per min. Fœtor oris was well marked. Purulent sputum 4–6 oz. daily. Physical signs in chest suggested multiple areas of bronchopneumonia and cavitation throughout lower two-thirds of both lungs. Sputum culture grew *Staph. aureus* and *H. influenzæ*.

Intramuscular penicillin, 15,000 units three-hourly, with penicillin inhalation four-hourly, produced a temporary improvement in general condition, with a fall of temperature, and sputum ceased to grow *Staph. aureus*; but *H. influenzæ* became much more numerous. Four days later, despite continued treatment, the patient relapsed, sputum increased, and temperature rose steadily. Radiography suggested multiple small cavities in lower half of both lungs. Death ensued seventy days after the start of illness. Sputum had remained purulent throughout, and in later weeks a pure growth of *H. influenzæ* was recorded on many occasions.

Necropsy confirmed the presence of a generalised acute bronchiectasis, together with an acute purulent tracheobronchitis. Swabs taken from the dilated terminal bronchi grew *H. influenzæ* alone, which were agglutinated by patient's serum taken ten days before death in dilutions up to 1 in 80.

CASE 2.—A man, aged 28, had had a similar clinical and bacteriological course in hospital, following admission for an illness which had lasted for only two days and which at the outset suggested atypical pneumonia, with cold agglutinins present in the serum in dilutions up to 1 in 800. Added infection took place mainly with hæmolytic streptococcus and *H. influenzæ*. The former were cleared from the sputum by penicillin inhalation, but the latter were present in pure culture for the last two weeks of a fatal illness lasting thirty-four days.

Necropsy showed an acute tracheobronchitis and bronchiolitis, together with an acute bronchiectasis. *H. influenzæ*, isolated from the lungs in pure culture after death, were agglutinated by patient's serum taken eight days previously in dilutions up to 1 in 20.

One woman, with a similar history, and with clinical and pathological findings akin to the two cases above, but generally milder, responded to penicillin inhalations and eventually recovered completely. Physical signs suggested an acute bronchiectasis at the height of infection. Subsequent 'Lipiodol' injections showed that there was no residual lesion.

Results of Pre- and Post-operative Treatment.—In 18 cases treated since August, 1945, in which penicillin inhalations were used before and after pneumonectomy or lobectomy for carcinoma of the lung or bronchiectasis, 2 have developed small bronchopleural fistulæ. This figure can be compared with an earlier similar series of 15 cases where penicillin was instilled into the pleural space at operation, and in which 5 cases developed fistulæ. Before penicillin was used, of 22 patients operated on by the same surgeon, 13 subsequently developed fistulæ.

DISCUSSION

Though the concentrations found in sputa provided a definite indication for using penicillin as an aerosol in the *chronic infections* described, the clinical effectiveness was less readily proved. Treatment by this route has also been indicated by various authors primarily interested in the absorption and excretion of the drug. Mutch and Rewell (1945) and Knott and Clark (1945) have shown that considerable amounts of penicillin appear in the blood and urine of normal persons inhaling a penicillin mist. Detailed papers by Barach et al. (1945), Olsen and Clagett (1945), and Hagen et al. (1945) have discussed the absorption and use of penicillin in aerosol in certain chronic and subacute pulmonary conditions, and Vermilye (1945) has described its use in general practice for the treatment of various infections of the upper respiratory tract.

It might be argued that, when lung disease is localised, as in lung abscess and in bronchiectasis, the affected part has a relatively poor air entry, and the penicillin will be deposited almost entirely in the healthy bronchioles and alveoli. The fact that in normal patients penicillin can be detected in the blood and is excreted in the urine within a few minutes of administration of the mist is strong evidence of rapid absorption from healthy alveoli. Many of the cases studied, however, had localised lesions in the lung (including a case of isolated upper-lobe bronchiectasis), and the sputum presumably came from these rather than from healthy parts, yet it contained detectable amounts of penicillin for as long as eight hours after administration. The most likely explanation is that penicillin mist or aerosol does reach the diseased parts, and that it dissolves in the mucus or pus which lies there, and is only slowly absorbed from these sites. This is an important point in therapy.

It is a considerable criticism of this investigation that no control series was studied, nor could old records be used for the purpose satisfactorily, since the time spent in hospital and the degree of improvement required before discharge have depended considerably on the pressure on available beds, which has been particularly acute during the period of study. In compiling table III, therefore, we have been as critical as we could, and have relied whenever possible on objective rather than subjective criteria of improvement. We feel satisfied that penicillin inhalation as administered has proved its value in two types of case particularly: chronic bronchitis with spasm (with or without acute exacerbation), and congestive cardiac failure brought on or made worse by respiratory infections. Patients with pneumonia whose general lung infection has been improved by systemic chemotherapy but who were left with a relatively intractable bronchitis and peribronchitis were also speeded in recovery. Similarly, patients with pulmonary tuberculosis (not included in the table) whose cough was aggravated by superadded non-tuberculous bronchitis were much relieved of their most troublesome symptom, without any ill effect upon the underlying tuberculosis being apparent. Most patients with bronchiectasis were benefited, but in nearly all the sputum was not abolished. It remains to be seen whether streptomycin given by inhalation would be more successful by eliminating the infection with coliform and other penicillin-resistant organisms. The rapid improvement noted in some patients may be due in part to psychological reasons—for administration of a mist has a straightforward common-sense appeal to them—and in certain cases the frequent postural drainage and deeper respirations during treatment have also played their part. But the most telling argument is the change in quantity, quality, and bacterial content of the sputum.

Certain considerations have always to be remembered. First, there are patients with bronchiectasis, &c., whose infecting organisms are insensitive to penicillin even at the high concentrations obtainable locally by inhalation. We have met 8 such, since this study was made, and they showed no response to treatment either clinically or bacteriologically. Secondly, as the necropsies showed, in the early days at any rate, the sputum may be free from pyogenic cocci, and yet these cocci can be found in the infected small bronchi. It is not justifiable to assume that inhaled penicillin will diffuse through the secretions to the infected surfaces, unless the amount of secretion is kept down by adequate removal (either by coughing or by postural drainage). Neither can penicillin inhalation be discontinued solely on the evidence that a single sputum sample contains no pyogenic cocci, but rather must the clinical condition and the evidence of successive sputum examinations be taken into account. None of our cases was treated for less than five days, and most required considerably longer if early relapse was to be prevented. Outpatient treatment has numerous technical snags, but the work described here demonstrates that treatment can be begun or continued in this way, with the result that patients have been able to leave did not confirm any persistent objective improvement in these patients' condition over any significant period of time, and even their subjective amelioration appeared to be evanescent. The average amount of sputum remained much the same.

Clinical diagnosis	No. of cases	No. of penicillin courses received	Apparent cure—i.e., rendered symptom-free and remaining so	Much symptomatic improvement	Slight improvement	No improvement
Bronchiectasis ..	6	4	0	0	0	6
Residual bronchitis (short duration)	6	1	5	1	0	0
Chronic suppurative bronchitis ..	5	4	0	0	0	5
Chronic non-suppurative bronchitis	5	3	0	3	2	0
Chronic bronchitic asthma ..	17	2–3	1	5	8	3
Allergic asthma ..	4	1	0	0	0	4

Bronchitis.—The patients with bronchitis of short duration did extremely well, their symptoms clearing completely during or immediately after their inhalation course, and they became perfectly fit. It was impossible after treatment to obtain any sputum for re-examination of micro-organisms. Two of these patients were treated as early as November, 1945, and they remained well during the winter, in striking contrast to their health during the past few years, when their winter bronchitis tended to linger on for several months.

The results in cases of long duration appeared to be directly related to the amount of sputum. Thus the chronic suppurative cases did not improve, whereas of the 5 dry bronchitics treated 3 were very much improved and 2 slightly. However, this improvement was short-lived, and in a few weeks these patients were as bad as ever. The predominant organisms had returned in the sputum, and a second, and in some cases a third, course of the penicillin inhalations was then given, which effected the same degree of improvement in each patient, but no prolongation of the improvement was noted. Besides the diminution in severity of cough and in amount of sputum, these patients could breathe much more easily, they felt clearer, and some of them said they were sleeping very much better. One man was able for the first time for years to go into a public-house without being provoked to a violent paroxysm of coughing on entering the smoky atmosphere. Even the suppurative cases appeared to improve in general health to some extent, and an increase in weight was a feature of 4 of the 5 dry bronchitics and 2 of the suppurative cases.

Asthma.—In the asthmatic group, as was expected, the allergic cases did not improve. On the other hand, significant results were obtained in the asthmatics with an underlying bronchial infection. These were all severe and established chronic cases, and improvement was real, though it must be emphasised that, with the one exception, the benefit conferred did not appear to be permanent. Apart from the patient who appeared to be cured, 3 patients were much improved during their first inhalation course, and these 3 patients, who later relapsed and again improved very quickly with a subsequent course, spent the best winter they had experienced for many years and, apart from their solitary minor relapse, were virtually symptom-free. The single case that became entirely symptom-free and remained so was a boy, aged 11 years, who had had asthmatic attacks by night and day for years until his inhalation course. During the first few days of this he began to improve, and at the end of it was symptom-free and has remained so subsequently. He had much cough and some sputum, the predominant organism being *Staph. aureus*: after treatment it was *Neisseria catarrhalis*. This patient received 2,000,000 units of penicillin in thrice-daily consecutive inhalations.

DISCUSSION

The difference in the results of treatment in the three groups of cases was rather what might have been expected. In the bronchiectatics the poor air entry in the region of disease, the gross infection with a multiplicity of organisms, and the extensive lung damage together constitute a most unfavourable combination, and it seems as if inhalations of penicillin by this method are not likely to play any significant part in treatment.

In the bronchitic patients results were much more encouraging, especially in cases of short duration. This is felt to be of real importance in view of the frequency with which recurrent attacks of bronchitis are followed by permanent damage to the bronchial epithelium, with accompanying peribronchial fibrosis, and ultimately a true chronic bronchitis. Any measure which can cut short these damaging attacks, or, better still, abort them, must be of inestimable value in the prevention of chronic bronchitis in susceptible persons. It seems likely that penicillin inhalations may be extremely useful as a prophylactic form of treatment in these patients when they contract an upper respiratory infection. In chronic bronchitis and bronchitic asthma it appears that the more dry the case the greater is the degree of improvement to be expected, and it may well be that inhalation of penicillin will have to be combined with sulphonamide therapy to deal with the penicillin-resistant organisms which otherwise appear to flourish.

Possibly the extremely small size of the particle produced by the vaporisation of the Collison apparatus allows the penicillin to pass too quickly over the affected bronchial mucosa into the alveoli, where it is absorbed. It is tempting to assume that a larger particle of penicillin in an oily solution would remain longer in contact with the affected mucosa and exert a more prolonged effect.

SUMMARY

Penicillin inhalations were given to 43 patients with bronchiectasis, bronchitis, or asthma.

In 6 patients with bronchiectasis so treated there was no improvement.

Of 6 patients with bronchitis of short duration 5 were apparently cured and 1 was much improved.

In 5 patients with chronic suppurative bronchitis there was no improvement.

Of 5 patients with chronic non-suppurative bronchitis all were improved, but none was cured.

Of 17 patients with chronic bronchitic asthma 1 was cured, 13 were improved, and 3 showed no improvement.

In 4 patients with allergic asthma there was no improvement.

In a high proportion of cases it was possible to eliminate penicillin-sensitive organisms from the sputum; but in some cases such an elimination was followed by luxuriant growth of coliform organisms, apparently leading in one case to bacteræmia.

REFERENCES

Barach, A. L., Silberstein, F. H., Oppenheimer, E. T., Hunter, T. H., Soroka, M. (1945) *Ann. intern. Med.* 22, 485.
Knott, F. A., Clark, W. H. (1945) *Lancet*, i, 468.
— Southwell, N. (1946) *Arch. Dis. Childh.* 21, 16.
Mutch, N., Hoskins, H. L. (1944) *Lancet*, ii, 775.
— Rewell, R. E. (1945) *Ibid*, i, 650.
Vermilye, H. N. (1945) *J. Amer. med. Ass.* 129, 250.

25,000 units to 1 c.cm. Patients received 100,000 units at each session, the inhalations taking about thirty minutes with the oxygen at 8 litres a minute. Owing to the shortage of beds, treatment was given at outpatient visits. For this reason it was not practicable to give the inhalations more than twice or three times a day, a reasonable method, however, in view of the fact that traces of penicillin can be detected in the blood all day with this technique, and penicillin can be recovered from the sputum as long as twelve hours after a single morning inhalation. A treatment course consisted in the administration of 1,000,000 units in ten consecutive twice or thrice daily sessions. In most cases the treatment course was repeated. Patients were instructed to breathe fairly quietly in through the nose and out through the mouth to obtain maximal deposition of penicillin in the bronchial tree and prevent inhalation straight through to the lungs, with consequent rapid absorption, as tends to happen after forced inspiration and deeper breathing.

SIDE-EFFECTS

A complication which may prove serious has been noted. In a high proportion of patients, it was possible to eliminate entirely from the sputum the penicillin-sensitive pathogens. Some patients who started treatment with a few colonies of coliform organisms in the sputum finished treatment with very many more colonies of these organisms. In a few patients the most luxuriant growth of coliform organisms was noted. In the following case it seems likely that a bacteræmia was the sequel.

An unmarried woman, aged 33, with some years' history of shortness of breath, was subject to recurrent bronchitic attacks in winter, during which she became more short of breath and wheezy, with a productive cough. Each attack usually lasted two or three weeks and was accompanied by a raised temperature. The attacks usually followed head colds, and she was quite well during the summer. There was a past history of rheumatic fever.

She was seen on May 30, the first day of such an attack. On examination she had aortic incompetence, moderate cardiac enlargement, no signs of decompensation, numerous rhonchi over both lungs, and a productive cough, with tenacious sputum. Pneumococci and *Strep. viridans*, both of which were penicillin-sensitive, predominated in the sputum, and a few colonies of coliform organisms were noted.

Treatment with penicillin aerosol inhalations was started at once, and she received 1,000,000 units in three days. Her symptoms and signs entirely disappeared, and she was very pleased at her rapid recovery. Examination of her sputum revealed a complete absence of the original pathogens; in their place was a profuse growth of coliform organisms. Specimens of sputum were difficult to obtain, but all specimens taken over a week contained these organisms and no others.

As she remained so well, she was advised to continue with the prophylactic use of a morning inhalation of 50,000 units of penicillin. This she did. Eleven days after the onset of her original attack of bronchitis she was suddenly seized with pain in the lower part of the abdomen at 3 A.M. and an intense desire to micturate. Almost unceasing frequency and dysuria continued until 9 A.M., when she was admitted to the ward. During this time she had profuse hæmaturia.

When seen soon after admission she was pyrexial and looked ill. She improved quickly on alkalis and fluids, though frequency and hæmaturia persisted two days. The urine contained organisms morphologically identical with those found in the sputum. She was treated with a sulphonamide course, and the urine became sterile.

MATERIAL

The patients were carefully selected from those attending the asthma outpatients clinic and were all seen by me on their first and each subsequent attendance. Their progress was on every occasion assessed by me. The aerosol inhalations were given in combination with the usual treatment applicable to each case. Most of the patients had been attending the clinic for some years and had been personally known to me for nearly two years; hence their condition was very familiar to me and was comparatively static.

Assessment of improvement in some of these patients was rather difficult, in view of the characteristic fluctuations. Assessment was based particularly on study of the cough and the sputum, especially its quality and quantity, together with relief from breathlessness, freedom from asthmatic attacks, and increase in well-being. Vital capacity was not materially altered by the treatment, and radiographic appearances remained substantially unchanged.

The predominant organisms in the sputum were usually various types of pneumococci or some form of streptococcus, especially *Strep. viridans*, and in nearly every case it was possible to clear these organisms for various lengths of time. In their place, as already stated, bacilli of the coliform type appeared fairly often. These organisms seem to flourish extremely in the absence of the common pathogens. In most patients the pre-existing pathogens returned some weeks or so after the inhalations had been discontinued, but their presence did not always conform with the clinical condition.

The cases totalled 43 and fell into three main groups: bronchiectasis, bronchitis, and asthma.

The cases of *bronchiectasis* were good representative examples of this disease, ranging from a mild cylindrical bronchiectasis, with 1½ oz. of sputum, to a gross saccular type in a collapsed bronchopulmonary segment, with 10 oz. of sputum. Bronchograms of the remaining patients revealed fusiform dilatation, and these patients had considerable sputum. Various stages of clubbing of the fingers were present in 5 patients, and 1 also had clubbing of the toes; 4 were toxic. All except the mild case had had postural drainage for periods from three months to five and a half years.

The *bronchitic* patients could be subdivided into two groups: those with symptoms of short duration, and the chronic cases. The former comprised 6 patients, of whom 5 were known to be "bronchial" and had bronchitis, which had followed a recent head cold. Treatment began in 1 case two days after the onset of the bronchitis, in the other 4 cases two and three weeks later. The remaining patient in this group had a severe post-pneumonic bronchitis of four months' duration. All had much cough and some thick tenacious sputum and were wheezy at night.

The second group, or chronic bronchitics, could be further subdivided into suppurative and non-suppurative cases; the latter were typical examples of chronic bronchitis and emphysema. The patients had many years' history, and all had severe symptoms, both in winter and in summer. There were associated bronchospasm and shortness of breath in all these cases, but no attacks of paroxysmal dyspnœa.

The *asthmatic* patients were all established cases, and were chosen, except 4 allergic cases, not only because they were comparatively static and therefore allowing of more reasonable assessment, but also because they were considered to be examples of bronchitic asthma in which the allergic element was minimal, and the underlying condition one of recurrent or chronic bronchial mucosal infection. Thus there was no allergic personal or family history, no eosinophilia, commonly a history of chestiness in the family, and exacerbations of symptoms in winter and after head colds. All treated cases had a penicillin-sensitive predominant organism in the sputum. History in most of these cases extended over many years, and the patients were not free from symptoms at any time during the twenty-four hours. On the whole, their major asthmatic attacks were fairly evenly spaced but were not such a prominent feature of their illness as was the case in the small allergic group.

RESULTS

The results of treatment are given in the accompanying table.

Bronchiectasis.—The bronchiectatic patients made no real improvement. The patients said their cough was easier or the sputum less offensive, but clinical observation athreptic infants. Lesné and Richet (1924) used for rectal infusion in three such cases a solution containing 4% glucose or 0·7% sodium chloride and 4% amino-acids. They did not draw any conclusions from these experiments. Shohl et al. (1939) demonstrated that full-term infants and older children could be kept in a positive nitrogen balance through amino-acids. Hill (1941) used a casein hydrolysate with good results in cases with allergic hypersensitivity to milk.

Practically all previous efforts to facilitate the assimilation of the milk in infant nutrition have aimed at eliminating the formation of curds. Thus, Blatt et al. (1940) suggested treatment of the milk with pancreatic enzymes before pasteurisation, whereby the formation of curds was reduced without any detectable hydrolysis of the milk-proteins.

CASEIN HYDROLYSATE AND ITS USE

A casein hydrolysate for intravenous nutrition had been prepared by two of us (E. J. and A. W.). The milk casein was purified by iso-electric precipitation and extraction with boiling alcohol, whereby salts, fats, and vitamins were removed. The enzymic hydrolysis was performed at 37° C with acetone-dried pancreas or a glycerol extract of pig pancreas. The completeness of the hydrolysis was followed analytically (van Slyke). The material was then submitted to dialysis by a special technique suggested by one of us (A. W.).[1] The preparation[2] contains 80–85% of free amino-acids. As the yield at manufacture is 80–100% of the original material, the amino-acid content can be said to be the same as in casein. It has no anaphylactogenic properties.

When the preparation was used as a supplementary food for premature infants, glucose was added to increase the calories in the mixture. To meet the possible salt requirements of the infants the Osborne-Mendel salt mixture was at first added to the preparation. Thus, the composition of this 'Aminosol'-glucose mixture was amino-acid mixture 25%, glucose 25%, and salt mixture 1·5%. Later the salt mixture was left out.

The preparation was always mixed with breast-milk, or with breast-milk and boiled water, during the first days of life. The dilution thus obtained was generally 1 in 20, and it was never less than 1 in 10. In most instances the mixture was given through a catheter during the first days or weeks of life, and later by mouth. Feeding by mouth was not as a rule difficult in premature infants, and it was always practicable, especially with children who had been given the mixture from the beginning. With older children, however, difficulty was encountered owing to the taste, but was overcome by giving the hydrolysate as a powder.

The question of the most suitable dosage is still under investigation. When we began our experiments we tried many different doses. When larger doses were given the infants often vomited, in most cases only small regurgitations. In most of the children there were no signs of digestive disturbance. Except during the earliest days a daily dose of 10 ml. of aminosol-glucose (2·5 g. of amino-acids) per kg. of body-weight was given practically in every case without causing any trouble such as vomiting or digestive disturbances. This dosage, however, is perhaps unnecessarily large for some infants, as it produces an excessive increase in weight. Doses half as large have often proved sufficient to give a satisfactory gain.

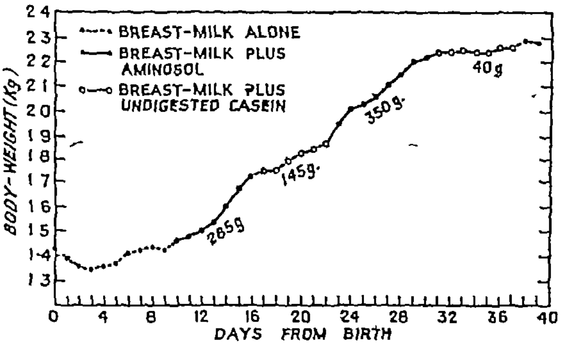


Fig. 2—Weight curve of case 2 (born eight weeks before term) on feeds indicated. Numerals alongside curve indicate weekly gains in weight. The supplementary foods were given in amounts of 2·5 g. per kg. of body-weight daily.

A point of particular interest was the effect produced by the amino-acid feeds during the earliest weeks of life. It is at this stage that the difficulty of bringing about a satisfactory gain in weight through breast-milk alone is greatest. To eliminate as far as possible the high variability which has always to be taken into account at this stage of life, it was arranged that the same infant should be given alternate feeds of breast-milk alone and of breast-milk to which the amino-acid mixture had been added. In this way we were able to estimate the effect without having too large a series of infants to examine.

Our first experiments were made in November, 1943, and the results in 30 cases were reported by Magnusson (1944a and b). Further cases are described below. In these cases (figs. 1–7) the daily amount of breast-milk given to an infant was the same during the different periods of comparison.

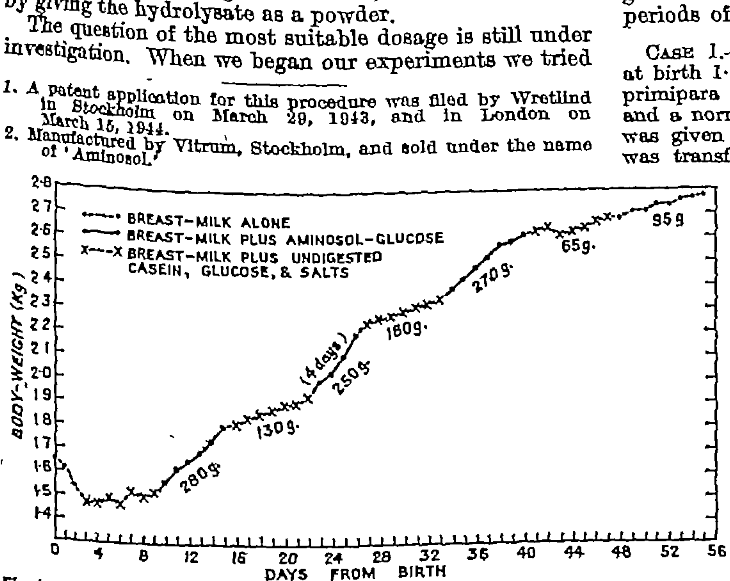


Fig. 1—Weight curve of case 1 (born two months before term) on feeds indicated. Numerals alongside curve show weekly gains in weight. The supplementary foods were given in amounts of 2·5 g. per kg. of body-weight daily.

Case 1.—Male, born two months before term. Weight at birth 1·64 kg., height 43 cm. The mother was a healthy primipara and had had an otherwise uneventful pregnancy and a normal delivery. Immediately after birth the infant was given 1 ml. of vitamin K, and about one hour later was transferred to the children's wards. His colour and tone were good, but his cry was weak and shrill, and his temperature 95·7° F. The subcutaneous fat was not abundant. The internal organs were apparently normal. Prothrombin index 110.

On the fourth day he had mild icterus neonatorum, which rapidly subsided. He was placed in a cradle at once, and for the first three weeks his temperature was slightly irregular, but after that it remained at 98·6° F all day.

From the ninth to the forty-eighth day he was given breast-milk supplemented by aminosol-glucose and by undigested casein, glucose, and salts alternately, usually for a week at a time (see fig. 1). Between the twentieth and the thirty-third days he had a slight cold, but no other signs of infection were noted. During the whole period he was in good health, and there was no cyanosis, œdema, or diarrhœa. On the second day of life the hæmoglobin was 110%, and on the fifty-sixth day 64%. Radiography of the bones of the hand when

---

[1] A patent application for this procedure was filed by Wretlind in Stockholm on March 29, 1943, and in London on March 15, 1944.

[2] Manufactured by Vitrum, Stockholm, and sold under the name of 'Aminosol.'

CASEIN HYDROLYSATE

A SUPPLEMENTARY FOOD FOR PREMATURE INFANTS

J. ERIK JORPES
M.D.
ASSISTANT PROFESSOR IN BIOCHEMISTRY

J. HENNING MAGNUSSON
M.D.
READER IN PÆDIATRICS

ARVID WRETLIND
M.B.
ASSISTANT IN PHARMACOLOGY

From the Caroline Institute and the Sachs' Children's Hospital, Stockholm

INFANTS weighing 2·5 kg. or less at birth generally require special care if they are to develop normally. For practical purposes such infants are considered immature, whether they have been born before, at, or after term. The large majority of them are born before term, and for this reason the expression "premature" infant is often used instead of "immature." As a general rule few, if any, infants whose birth-weight is below 1·0 kg. are viable. Only when the weight is 1·2 kg. or more are the prospects for life more hopeful. Even with this weight, however, the mortality is still high.

Premature infants display further characteristics according to the degree of immaturity. Immediately after birth they often appear to be comparatively robust; but after about twenty-four hours they lie—at least the most undeveloped of them—in an almost continuous state of somnolence, without movement and almost without sound. This functional insufficiency is only temporary, and the signs of weakness gradually diminish and finally disappear.

Apart from complications arising from intracranial emorrhage and infections, there are three spheres n which the functional weakness can manifest itself: heat regulation, respiration, and nutrition. Heat regulation and respiration no longer present any great difficulties, provided the respiratory condition, such as apnœa, is not due to intracranial hæmorrhage or other such factor. Nutrition, on the other hand, is a more complicated problem and more difficult of solution.

DIFFICULTIES IN FEEDING

It is generally agreed that human milk is superior to all other types of food for premature infants, and babies in this category are not subjected without very good reason to the dangers of artificial feeding. Breast-milk seems, in fact, to be one of the essentials for a low mortality in this group. On the other hand, the incompletely developed infant has as a rule been forced to begin its extra-uterine life much too soon, and in its case, therefore, breast-milk is not so ideal a food as it is for children born at term.

Another difficulty in feeding the premature child, not met with in the full-term infant, is the supply of food in sufficient quantities, especially in the case of smaller infants with a birth-weight of 1·5 kg. or less. To supply the calories required by these infants solely by breast-milk, with its 70-odd calories per decilitre, strains not only the capacity of the stomach but also the whole digestive system, which in nearly all premature infants, during the first weeks of life at least, is weak.

Because of the tendency of these infants to develop acute inanition a regular feeding regimen is started early, not later than twelve hours after birth. To compensate for the loss of liquid through the kidneys, bowels, lungs, and skin, boiled water is given by mouth, or Ringer's solution is injected subcutaneously during the first few days of life. The smallest babies often lack both sucking and swallowing reflexes at first; and when this is so, they must be fed through a catheter—a comfortable and easily executed procedure, especially since vomiting reflexes also are very often absent. Feeding through a catheter is also useful when the infant is too weak to suck a rubber teat, vomits, or becomes cyanotic while feeding.

Only small quantities of human milk can be given during the first days of life. The amounts supplied should at first not exceed the minimal food requirements for life, and overfeeding must be as conscientiously avoided as underfeeding. The amounts must be very gradually increased; the smaller and less developed the infant, the greater the care needed. Caution is especially necessary when vomiting and cyanosis are observed during the meal. Further increases are based on the infant's weight and tolerance of food. The premature babies in this hospital receive on an average 100 calories per kg. daily. When breast-milk is used as the initial food, the weight, after dropping at first, often remains stationary during the first three or even four weeks of life. After this it begins to rise gradually, provided no complications, such as infections, supervene.

IMPORTANCE OF PROTEIN

Various attempts have been made to increase the supply of calories by giving supplementary foods. In most cases the additional nourishment has consisted of small quantities of a concentrated cows-milk mixture, the object being to meet the infant's large requirements of protein and mineral salts. Casein, glucose, and a mixture of both have been tried.

On purely theoretical grounds one can assume that the proteins are of the utmost importance for the nutrition of the premature infant. Not only must metabolised body proteins be replaced, but also proteins are necessary for growth. For the newborn premature infant considerable difficulties can arise when it has been deprived of its food-supply from the placenta, which supplied amino-acids with the blood; now the food contains only *unsplit proteins. It is not surprising that* premature infants assimilate the proteins badly and do not gain weight in spite of a considerable protein intake, especially as their digestive processes at this early stage are functioning imperfectly. It therefore seems logical to feed the premature infant with a mixture of all the essential amino-acids. Since the amino-acids are easily absorbed from the intestine, an oral intake would be as effective as the intravenous nutrition of adults with amino-acids introduced by Elman and his co-workers.

An experiment of this kind performed by us has proved completely successful. When the human milk given to premature infants was supplemented by a mixture of free amino-acids and polypeptides containing all the amino-acids found in casein, the infants consistently showed an immediate gain in weight. Further, this gain corresponded roughly to the weight of the proteins assumed to be synthesised from the added amino-acids, due regard being paid to the water fixation of the tissue proteins thus formed. The amino-acids seem to have been completely assimilated. It is considered especially desirable that this form of treatment should be tried during the first weeks of life, before the functional capacity of the premature infant has become stabilised. Our results hitherto have been absolutely unambiguous, and in every instance the gain in weight was much greater during the periods when the breast-milk was supplemented by the amino-acid mixture.

We have been unable to find in the literature any references to similar suggestions for the nutrition of premature infants. In fact amino-acids have long been used for quite other purposes in connexion with infant feeding.

Ribadeau-Dumas and Fouet (1924) recommended the use of amino-acids parenterally for the nourishment of athreptic infants. Lesné and Richet (1924) used for rectal infusion in three such cases a solution containing 4% glucose or 0·7% sodium chloride and 4% amino-acids. They did not draw any conclusions from these experiments. Shohl et al. (1939) demonstrated that full-term infants and older children could be kept in a positive nitrogen balance through amino-acids. Hill (1941) used a casein hydrolysate with good results in cases with allergic hypersensitivity to milk.

Practically all previous efforts to facilitate the assimilation of the milk in infant nutrition have aimed at eliminating the formation of curds. Thus, Blatt et al. (1940) suggested treatment of the milk with pancreatic enzymes before pasteurisation, whereby the formation of curds was reduced without any detectable hydrolysis of the milk-proteins.

CASEIN HYDROLYSATE AND ITS USE

A casein hydrolysate for intravenous nutrition had been prepared by two of us (E. J. and A. W.). The milk casein was purified by iso-electric precipitation and extraction with boiling alcohol, whereby salts, fats, and vitamins were removed. The enzymic hydrolysis was performed at 37° C with acetone-dried pancreas or a glycerol extract of pig pancreas. The completeness of the hydrolysis was followed analytically (van Slyke). The material was then submitted to dialysis by a special technique suggested by one of us (A. W.).[1] The preparation[2] contains 80–85% of free amino-acids. As the yield at manufacture is 80–100% of the original material, the amino-acid content can be said to be the same as in casein. It has no anaphylactogenic properties.

When the preparation was used as a supplementary food for premature infants, glucose was added to increase the calories in the mixture. To meet the possible salt requirements of the infants the Osborne-Mendel salt mixture was at first added to the preparation. Thus, the composition of this 'Aminosol'-glucose mixture was amino-acid mixture 25%, glucose 25%, and salt mixture 1·5%. Later the salt mixture was left out.

The preparation was always mixed with breast-milk, or with breast-milk and boiled water, during the first days of life. The dilution thus obtained was generally 1 in 20, and it was never less than 1 in 10. In most instances the mixture was given through a catheter during the first days or weeks of life, and later by mouth. Feeding by mouth was not as a rule difficult in premature infants, and it was always practicable, especially with children who had been given the mixture from the beginning. With older children, however, difficulty was encountered owing to the taste, but was overcome by giving the hydrolysate as a powder.

The question of the most suitable dosage is still under investigation. When we began our experiments we tried many different doses. When larger doses were given the infants often vomited, in most cases only small regurgitations. In most of the children there were no signs of digestive disturbance. Except during the earliest days a daily dose of 10 ml. of aminosol-glucose (2·5 g. of amino-acids) per kg. of body-weight was given practically in every case without causing any trouble such as vomiting or digestive disturbances. This dosage, however, is perhaps unnecessarily large for some infants, as it produces an excessive increase in weight. Doses half as large have often proved sufficient to give a satisfactory gain.

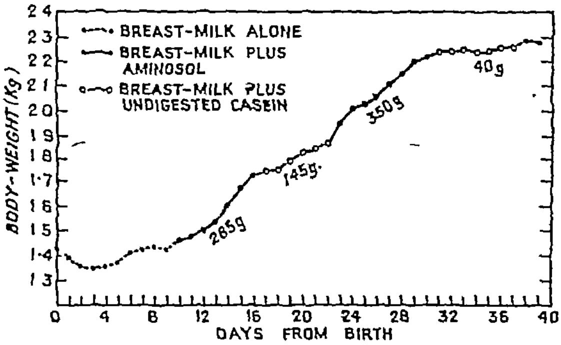


Fig. 2.—Weight curve of case 2 (born eight weeks before term) on feeds indicated. Numerals alongside curve indicate weekly gains in weight. The supplementary foods were given in amounts of 2·5 g. per kg. of body-weight daily.

A point of particular interest was the effect produced by the amino-acid feeds during the earliest weeks of life. It is at this stage that the difficulty of bringing about a satisfactory gain in weight through breast-milk alone is greatest. To eliminate as far as possible the high variability which has always to be taken into account at this stage of life, it was arranged that the same infant should be given alternate feeds of breast-milk alone and of breast-milk to which the amino-acid mixture had been added. In this way we were able to estimate the effect without having too large a series of infants to examine.

Our first experiments were made in November, 1943, and the results in 30 cases were reported by Magnusson (1944a and b). Further cases are described below. In these cases (figs. 1–7) the daily amount of breast-milk given to an infant was the same during the different periods of comparison.

CASE I.—Male, born two months before term. Weight at birth 1·64 kg., height 43 cm. The mother was a healthy primipara and had had an otherwise uneventful pregnancy and a normal delivery. Immediately after birth the infant was given 1 ml. of vitamin K, and about one hour later was transferred to the children's wards. His colour and tone were good, but his cry was weak and shrill, and his temperature 95·7° F. The subcutaneous fat was not abundant. The internal organs were apparently normal. Prothrombin index 110.

On the fourth day he had mild icterus neonatorum, which rapidly subsided. He was placed in a cradle at once, and for the first three weeks his temperature was slightly irregular, but after that it remained at 98·6° F all day.

From the ninth to the forty-eighth day he was given breast-milk supplemented by aminosol-glucose and by undigested casein, glucose, and salts alternately, usually for a week at a time (see fig. 1). Between the twentieth and the thirty-third days he had a slight cold, but no other signs of infection were noted. *During* the whole period he was in good health, and there was no cyanosis, œdema, or diarrhœa. *On* the second day of life the hæmoglobin was *110%*, and on the fifty-sixth day 64%. Radiography of the bones of the hand when

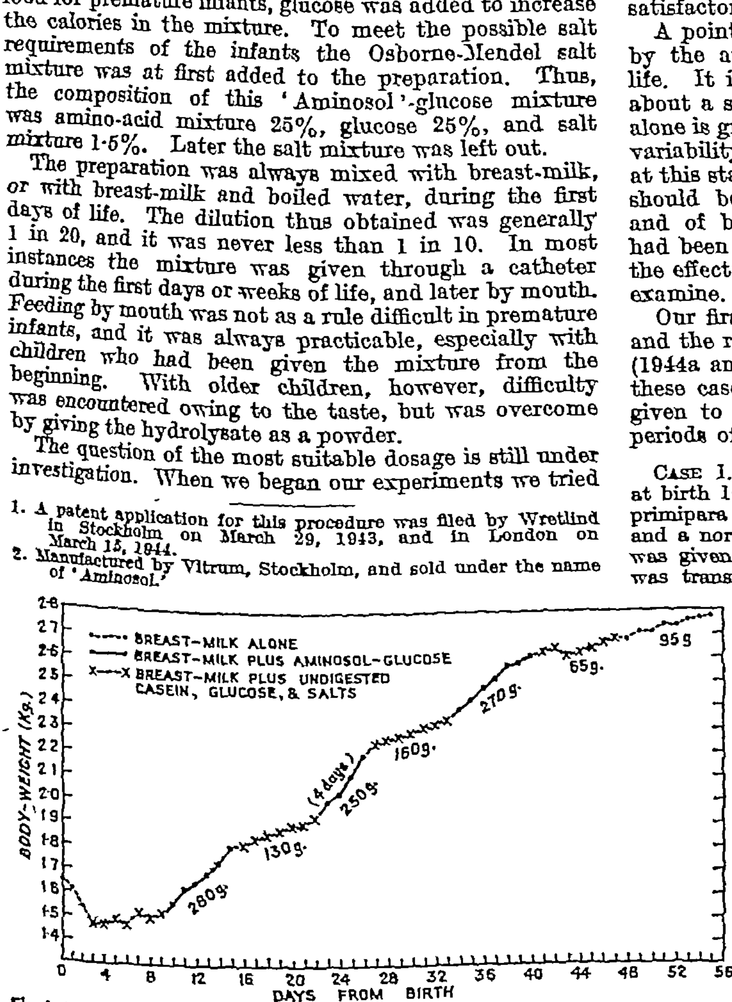


Fig. 1—Weight curve of case I (born two months before term) on feeds indicated. Numerals alongside curve show weekly gains in weight. The supplementary foods were given in amounts of 2·5 g. per kg. of body-weight daily.

---

1. A patent application for this procedure was filed by Wretlind in Stockholm on March 29, 1943, and in London on March 15, 1944.
2. Manufactured by Vitrum, Stockholm, and sold under the name of 'Aminosol.'

GAIN IN WEIGHT DURING FIRST MONTH OF LIFE IN PREMATURE INFANTS WHOSE WEIGHT AT BIRTH WAS 1·9–2 KG. (TABLE I) AND 1·3–1·4 KG. (TABLE II)

Age	I				II			
	Fed on breast-milk alone		Fed on breast-milk plus aminosol-glucose		Fed on breast-milk alone		Fed on breast-milk plus aminosol-glucose	
	Cases	Av. weight (kg.)	Cases	Av. weight (kg.)	Cases	Av. weight (kg.)	Cases	Av. weight (kg.)
Birth	38	1·961	9	1·962	30	1·368	7	1·354
1 week	37	1·813	9	1·900	29	1·249	7	1·376
2 weeks	38	1·925	8	2·079	28	1·354	7	1·521
3 weeks	36	2·036	6	2·223	23	1·505	6	1·697
1 month ..	25	2·226	6	2·523	21	1 697	6	2·008
Gain in weight during first month of life	..	0·265	..	0·561	..	0·329	..	0·654

he was two months old did not show any signs of rickets.

CASE 2.—Male, born eight weeks before term. Weight at birth 1·44 kg., height 41 cm. The parents were healthy. His mother, aged 28, was a primipara and had had repeated hæmorrhages from the uterus during pregnancy. The delivery was spontaneous, with breech presentation. Immediately after birth the infant was given 1 ml. of vitamin K plus 8 ml. of citrated blood intramuscularly, and he was then transferred to the children's wards.

On examination a few hours later, he was of good colour but flabby, his movements were poor, his cry was weak, and 's temperature 92° F. The subcutaneous fat was not abunt, the testes were in the inguinal canal, and the internal ıs were apparently normal. Prothrombin index 90. was placed in an incubator for the first ten days, and after at his temperature remained stable in a cradle with a hot-ater bottle.

From the ninth to the thirty-eighth day he was given breast-milk supplemented by aminosol-glucose and by undigested casein alternately for about a week at a time (*see* fig. 2). Between the tenth and the twenty-seventh days he had a slight cold, without other signs of infection. His general condition remained good, he had no cyanosis, œdema, or diarrhœa. During the first three weeks he was fed through a catheter; after that he sucked a rubber teat and was started at the breast on the thirty-eighth day. At the end of the first week he was given a course of vitamin D_2, 500,000 international units altogether. The hæmoglobin was 136% on the second day of life, and 76% on the thirty-ninth day. He was discharged in good health and was then having six breast-feeds a day.

In all the tests where, as in these two cases, the effect of the amino-acid mixture was compared with that of undigested casein there was a much larger gain in weight while the infant was receiving the amino-acid mixture. The amount of calories supplied in the supplementary food was the same in both cases. The increase in weight during the amino-acid periods can therefore not be set down to the extra supply of calories. The cause is undoubtedly the amino-acids. In other words, the premature infant cannot assimilate, at any rate completely, the undigested casein. Case 2 also goes to show that the decisive factor in the gain in weight is the amino-acids and not the glucose or salts.

It is well known that premature infants have a tendency to œdema, and that the œdema often appears during one of the first days of life. According to Young et al. (1941) the cause is to a large extent the low sodium and chloride clearances. The salt content of the amino-acid mixture should therefore be carefully considered. To determine whether the effect of the preparation was brought about by the amino-acids or by the salts, a comparison was made between aminosol and the ash from the preparation. The results obtained are shown in figs. 3, 4, and 5.

As the premature infant is extremely sensitive, it was considered advisable to use for oral administration an amino-acid mixture as pure as that given intravenously. Figs. 6 and 7 compare the results obtained with aminosol and with another preparation of casein hydrolysate not so pure.

LENGTH OF TREATMENT

The question arises whether amino-acids should be given to all premature infants during the early weeks of life, or whether they should be given only to those showing an unsatisfactory weight increase on breast-milk alone. Another question is how long the amino-acid feeds should be continued. If an infant is fed for a period with amino-acids one week and a corresponding amount of undigested casein the next, the difference in the weight increase in favour of the amino-acid feeds is as a rule very great during the first weeks. Towards the end of the second month of life this difference becomes gradually less and finally disappears. In other words, the addition of amino-acids to the breast-milk is of most value during the first few weeks of life. To ascertain how long the amino-acid feeds should be continued, we are studying a series of infants who are receiving amino-acid mixture added to breast-milk in an unbroken period until they are placed at the breast. As a rule, for technical reasons, the amino-acid treatment must be discontinued when the infant has learnt to suck the breast.

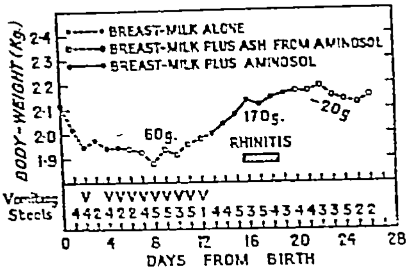
Tables I and II show the results obtained by this continuous treatment in two series of infants belonging to different weight-groups. The number of infants treated so far is too small to allow general conclusions to be drawn, but the greater increase in weight in the infants fed with amino-acids is very evident. Some of the infants reared on breast-milk without added amino-acids received supplements of glucose or of casein, or a mixture of both, during the last half of the month. The amount of breast-milk received by the test and control groups was the same.

TABLE III—GAIN IN WEIGHT DURING FIRST FIVE WEEKS OF LIFE IN TRIPLETS BORN SIX WEEKS BEFORE TERM AND REARED ON DIFFERENT DIETS

Age	Body-weight (kg.)		
	Breast-milk	Breast-milk plus aminosol-glucose	
	Case 3	Case 4	Case 5
Birth	2·030	1·850	1·650
1 week	1·900	1·800	1·620
2 weeks	2·030	2·020	1·980
3 weeks	2·230	2·260	2·130
4 weeks	2·300	2·440	2·320
5 weeks	2·460	2·680	2·500
38 days	2·560	2·820	2 610
Gain in weight during first 38 days of life ..	0·530	0·970	0·960

We have observed the effect of amino-acid feeds during the first weeks of life in a set of triplets (cases 3, 4, and 5). The two smallest infants received breast-milk to which aminosol-glucose had been added, and the largest received breast-milk alone. The gains in weight are shown in table III. The parents were healthy. The mother, aged 29, was a primipara, and her pregnancy had been uneventful, except that the triplets were born six weeks before term. Birth was spontaneous, with the first triplet in vertex presentation, and the second and third in breech presentation. All three infants were in good condition at birth. Cases 3 and 4 were almost certainly uniovular. The triplets were admitted to the Norrtull Children's Hospital when they were not quite a day old.

3

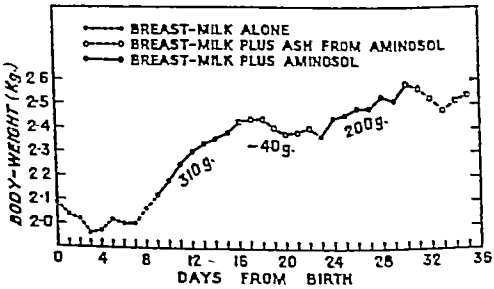


Figs. 3-5—Weight curves of three premature infants on feeds indicated. Numerals alongside curves show weekly gains or losses in weight. (Where a food was given for more than a week at a time, as in fig. 5, vertical lines show the weeks to which the gains in weight refer.) These experiments were performed to determine the relative merits of amino-acids and salts in aminosol. The aminosol was given in amounts of 2·5 g. per kg. of body-weight daily, and the ash was given in amounts derived from 2·5 g. of aminosol per kg. of body-weight daily.

CASE 3.—Male. Birth weight 2·03 kg., height 43 cm. On admission his temperature was 96·8° F, general condition good. He had a good colour and a strong cry. Subcutaneous fat abundant, lanugo abundant, testes descended, and internal organs apparently normal. Blood-picture normal. During the first week a prothrombin determination showed a coagulation-time of 10 min. Injections of vitamin K had no effect, but intramuscular administration of blood had a strong effect, which, however, did not last. The same features were observed in the other two infants. On the fourth day he had mild icterus neonatorum, which disappeared completely by the third week after birth. There was no cyanosis or œdema.

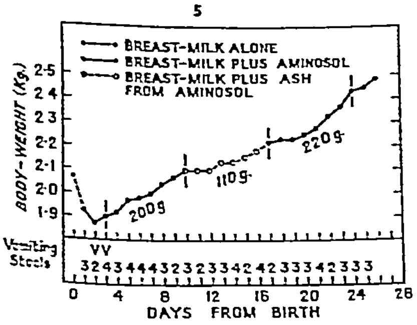
He was fed through a catheter during the first week, sucked a rubber teat strongly from the eighth day onwards, was started at the breast at the age of two weeks, and a week later was taking five breast-feeds a day. Except for the first five days, during which he was given, like his brothers, boiled water by mouth, he received only breast-milk during the whole time he was in the hospital.

4



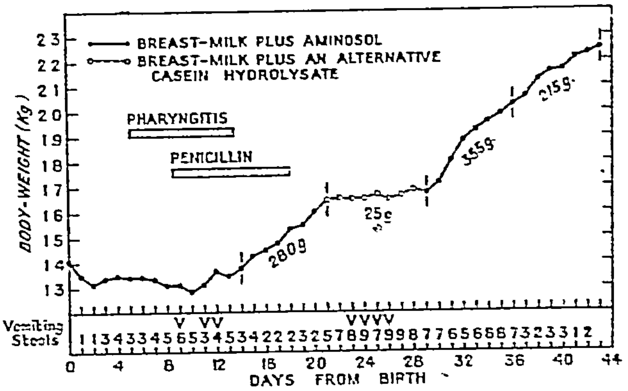
He was placed in a cradle from birth, but for the first three weeks a hot-water bottle was necessary. During his stay in hospital he showed no signs of infection and had no diarrhœa. Both he and his brothers received on the third and ninth days of life an intensive course of vitamin D_2, 500,000 international units in all. On the second day the hæmoglobin was 152%, and on the thirty-fourth day 116%. As in the case of his brothers, radiography of the wrist bones (on the thirty-fourth day of life) revealed no signs of rickets.

5



He was discharged in good health on the thirty-eighth day, weighing 2·56 kg. and measuring 48 cm. At a follow-up examination at the age of 6 months he weighed 6·5 kg. and measured 62·5 cm. There were no signs of rickets, and the hæmoglobin was 92%.

6



Figs. 6 and 7—Weight curves of two premature infants on feeds indicated. Numerals alongside curves show weekly gains in weight. (Where a food was given for more than a week at a time, as in fig. 6, vertical lines show the weeks to which the gains in weight refer.) These experiments were performed to determine the relative merits of aminosol and another preparation of casein hydrolysate. The supplementary feeds were given in amounts of 2 g. per kg. of body-weight daily.

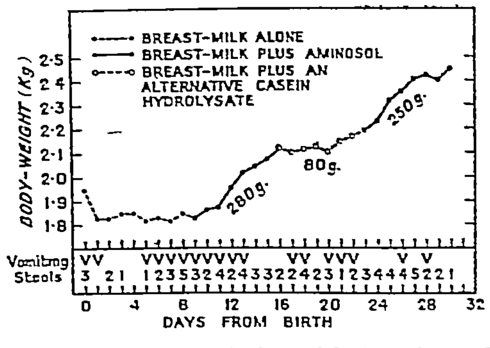
CASE 4.—Male. Birth weight 1·85 kg., height 42·5 cm. On admission his temperature was 97° F and general condition good. He had a strong cry and a good colour, his movements were good, subcutaneous fat rather meagre, lanugo abundant, testes descended, and internal organs apparently normal. He showed no especially pronounced jaundice. Blood-picture normal. No cyanosis and no œdema.

He was fed through a catheter for the first week, took his food through a rubber teat the second week, was started at the breast in the third week, and from the fourth week onwards was having five breast-feeds a day. This infant, like case 5, was given 10 ml. of aminosol-glucose per kg. of body-weight a day added to the breast-milk.

He was placed at once in a cradle, and from the fourth week onwards his temperature remained level without a hot-water bottle. While in the hospital he showed no signs of infection and had no diarrhœa. The hæmoglobin was 137% on the second day and 89% on the thirty-fourth day.

He was discharged on the thirty-eighth day in good health, weighing 2·82 kg. and measuring 48 cm. At a follow-up examination at the age of 6 months he weighed 6·5 kg. and measured 63·5 cm. No signs of rickets; hæmoglobin 70%.

7



CASE 5.—Male. Weight at birth 1·65 kg., height 42·5 cm. On admission his temperature was 96° F, his cry weak, his movements poor, subcutaneous fat poorly developed, lanugo abundant, testes descended, and internal organs apparently normal. Blood-picture normal. He had mild icterus neonatorum, which soon disappeared.

During the first day at the hospital it was necessary to administer oxygen because of cyanosis, but there were no further attacks during the first weeks of life. He showed no signs of œdema while in hospital. He was placed at once in a cradle, but it was not until after the middle of the fourth week that he could do without a hot-water bottle.

He was fed through a catheter during the first and the greater part of the second week. After that he sucked a rubber teat until he was a month old, and was then placed at the breast five times a day. For extraneous reasons he could not be placed at the breast earlier.

During the first days of life his temperature was irregular, fluctuating between 96° F and 101·5° F. On the tenth day he had an infection of the upper respiratory tract, which persisted in a more or less aggravated state for the rest of his stay in hospital. The sedimentation-rate varied between 16 and 25 mm. in 1 hour. Except for a bad attack of cyanosis on the forty-seventh day of life the patient was, however, in good general condition the whole time; he gained steadily in weight and had no vomiting or diarrhœa.

Because of the infection he was kept at the hospital longer than his brothers and was not discharged until he was fifty-three days old. He was then in good health and had only a slight catarrhal discharge from the nose. He weighed 3·1 kg. and measured 49·5 cm. The hæmoglobin, which was 112% on the second day of life, was now 70%. At a follow-up examination at the age of 6 months he weighed 5·55 kg. and measured 61 cm. No signs of rickets; hæmoglobin 94%.

SUMMARY

Over 100 premature infants have been given a mixture of amino-acids, an enzymic casein hydrolysate, as a supplement to breast-milk. In most instances the daily dose was 2·5 g. of amino-acids per kg. of body-weight, together with an equal amount of glucose.

The infants tolerated the amino-acid mixture well, when it was given according to this regimen. There were no signs of digestive disturbance.

The feeding of this mixture of amino-acids produced in every instance a distinctly higher gain in weight than breast-milk alone.

A comparison between the effects of this amino-acid mixture and of a mixture containing undigested casein, glucose, and salts in the same strengths and proportions proved that the gain in weight was consistently greater during the periods when the infants were receiving amino-acids than when casein was being administered. By special tests, in which neither glucose nor salt mixture was added to the diet, it was demonstrated that e gain in weight was due to the amino-acids.

e results achieved up to now indicate that by inistering this supplementary food we can shorten e stay in hospital of these infants.

REFERENCES

Blatt, M. L., Harris, E. H., Jacobs, H. M., Zeldes, M. (1940) *J. Pediat.* 17, 435.
Hill, L. W. (1941) *J. Amer. med. Ass.* 116, 2135.
Lesné, E., Richet, C. (1924) *Bull. Soc. Pédiat. Paris*, 22, 414.
Magnusson, J. H. (1944a) *Nature, Lond.* 154, 91.
— (1944b) *Svenska Läkartidn.* 41, 1041.
Ribadeau-Dumas, L., Fouet, A. (1924) *Bull. Soc. Pédiat. Paris*, 22, 410.
Shohl, A. T., Butler, A. M., Blackfan, K. D., MacLachlan, E. (1939) *J. Pediat.* 15, 469.
Young, W. F., Hallum, J. L., McCance, R. A. (1941) *Arch. Dis. Childh.* 16, 243.

ACUTE ABDOMINAL LYMPHADENITIS

IN CHILDREN

ALFREDA H. BAKER
M.D. Belf., F.R.C.S.
SURGEON

URSULA JAMES
M.B. Lond., M.R.C.P.
PHYSICIAN

OSTER HOUSE HOSPITAL (E.M.S.), ST. ALBANS

EVERY surgeon who operates on acute abdominal conditions in children must meet from time to time cases in which the most striking pathological change is well-marked enlargement of the mesenteric lymph-glands. Experience soon convinces him that the condition is not tuberculous, and since some degree of appendicular inflammation is commonly associated with the adenitis, the appendix is removed, and no particular interest may be taken in the glandular change. We noticed that these cases showed a pronounced tendency to chest complications, and gradually we realised that the picture was so well-defined that it must represent a clinical entity. We have now seen and treated 32 cases of acute abdominal adenitis, and have reached fairly definite conclusions about the diagnosis and treatment. Although we do not think that operation is the right treatment, we have found that there is a slight but definite danger of the supervention of appendicular obstruction, and therefore the only safe place to treat the children is in hospital, where pædiatrician and surgeon are both available and consultation between them is possible.

Acute abdominal adenitis is characterised by the acute onset of abdominal pain and pyrexia, associated with pharyngitis or tonsillitis and with a minor respiratory infection. Provided the child does not have an operation the illness runs a course of 12–14 days, after which full recovery is to be expected. If, on the other hand, the abdomen is opened the lung condition flares up and the child may develop a sharp attack of pneumonia. The average stay in hospital of the children who had appendicectomy performed was 3–4 weeks. Since appendicular disease is the commonest cause of severe abdominal pain in children, it is inevitable that most of these cases of acute abdominal lymphadenitis will be sent to hospital labelled appendicitis, and it is a matter of some concern to decide not to open the abdomen.

ILLUSTRATIVE CASE-RECORD

A boy, aged 9 years, was admitted to hospital with a history of intermittent central abdominal pain for 4 days during which he had vomited five times. He had not had a bowel action for 3 days. For 3 days he had had a red rash on his abdominal wall.

On admission his temperature was 102·2° F, pulse-rate 128, and respiration-rate 24 per min. He was flushed, with well-marked circumoral pallor and a "strawberry" tongue. There was an erythematous rash over the abdomen. His throat was injected and he had a granular pharyngitis. The cervical lymph-glands were enlarged and tender; there was slight enlargement of the axillary and inguinal glands. At the base of the right lung the percussion note was impaired, the air entry was diminished, and there were a few inconstant crepitations and a pleural rub in the midaxillary line. No abnormality was found in the cardiovascular system, apart from the tachycardia. The child was having attacks of abdominal colic when admitted, and the lower half of the abdomen was tender on palpation, the maximum tenderness being over the right iliac fossa (R.I.F.). There was also tenderness in the right renal angle. Slight resistance of the muscles on the right side of the abdomen was present, but there was no abdominal rigidity. Rectal examination was negative. The leucocyte count was 12,000 per c.mm. (polymorphs 46%, monocytes 12%, lymphocytes 35%). A heavy growth of hæmolytic streptococci was obtained from the throat swab. The Paul Bunnell test was negative.

At the end of 24 hours the abdominal colic ceased and the temperature was normal on the second day. On the 4th day the temperature rose to 102° F with an exacerbation of the abdominal pain. Pyrexia and abdominal symptoms subsided finally on the 7th day. The rash faded on the day after admission; the chest signs had cleared by the 3rd day. Treatment was by rest in bed, warmth, light diet, and sulphanilamide insufflations of the throat. The patient was discharged on the 19th day, and when last seen, a year and 3 months later, was quite well and had had no recurrence of abdominal pain.

This case was rather more severe than the average and showed definite streptococcal manifestations. No other child in the series had a rash.

ANALYSIS OF 32 CASES

The children were all treated in the wards of Oster House Emergency Hospital, St. Albans, and were admitted from a comparatively small area of Hertfordshire. Their ages ranged from $2^1/_2$ years to 11 years; 12 were boys and 20 were girls. In 11 cases laparotomy was performed and the appendix removed.

Of the 32 children, 28 have been seen at intervals varying from 3 to 26 months after their discharge from the wards, and careful inquiry has been made as to their health and their freedom or otherwise from abdominal pain. One case only, a girl of 9 years, has had to be readmitted, 13 months after her first attack.

On June 29, 1943, this girl was admitted with a history of 3 weeks' malaise and tiredness. On the day of admission she

TABLE SHOWING PYREXIA, PULSE-RATE, AND LEUCOCYTOSIS ON ADMISSION

Case	Temp. °F	Pulse-rate	W.B.C.	PMN (%)	Case	Temp. °F	Pulse-rate	W.B.C.	PMN (%)
1	100·8	136	8900	69	17	100·2	120	9325	69
2	100·6	128	..	..	18	99·0	104	8250	56
3	102·6	100	6700	59	19	102·2	128	12,100	46
4	99·4	110	18,850	49·5	20	99·0	94	12,525	61
5	101·2	124	6900	65	21	99·2	80	6400	58·5
6	99·0	120	20,700	65	22	101·0	128	22,575	84·5
7	102·4	120	38,420	93	23	98·0	92	15,075	66·5
8	99·2	92	5800	50	24	102·4	120	..	..
9	102·0	120	10,800	47	25	100·0	120	..	..
10	102·6	160	..	..	26	100·0	132	10,850	48
11	99·4	112	10,750	..	27	102·8	130	11,625	45
12	101·0	132	5250	48	28	102·4	128	6600	52
13	99·0	120	15,600	74·4	29	98·0	124	..	..
14	100·0	130	..	..	30	98·6	84	..	..
15	102·6	150	7250	50	31	102·8	150	..	..
16	99·8	120	12,400	58	32	102·6	150	13,400	67

had had two attacks of pain around the umbilicus. There was no history of nausea or vomiting, of urinary symptoms, or of bowel irregularity. She was actually having colic when examined, and was found to be tender in the R.I.F., in the L.I.F., and in the right renal angle. The temperature was 99·4° F, pulse-rate 110, and respiration-rate 22 per min. She had circumoral pallor, a strawberry tongue, and infected tonsils. There was no abdominal distension or guarding. Examination of the chest showed diffuse bronchitis, and diminished air entry and pleural friction at the right base. It was decided not to operate. All signs and symptoms disappeared by the 3rd day and she was discharged apparently well on the 12th day.

On June 20, 1944, she was readmitted. In the interval she had had a few attacks of abdominal pain. For 4 days before admission she had been feverish, and for a day she had had acute abdominal pain and diarrhœa. She was also complaining of a sore throat. Examination revealed circumoral pallor and pharyngitis as before, but the lungs were clear. The temperature was 102·4 °F and the pulse-rate 120 per min. There was well-marked tenderness and guarding in the R.I.F., and at operation, which was carried out immediately, gangrene of the terminal two-thirds of the appendix was found. There was also generalised enlargement of the mesenteric and para-aortic glands. Postoperatively the pyrexia subsided by lysis and the temperature was normal by the 5th day. The patient made a good recovery.

This was the only case in the series in which we had reason to regret not having removed the appendix before allowing a child to go home.

The constant features in the 32 cases were abdominal pain, pharyngitis, and pyrexia. Vomiting occurred in about half the cases. Abnormal signs at the base of the right lung were present in 25 cases when first seen. Of the 11 cases treated by operation, 5 developed serious right-sided chest complications—either pneumonia (3 cases) or collapse. The temperature and pulse findings on admission are shown in the table. Pyrexia is on the whole higher than is usual in the early stages of appendicular disease. Leucocytosis is by no means a constant feature, and we have found neither the white-cell count nor the differential count of much value in diagnosis or prognosis.

COURSE OF THE ILLNESS

Often there is a history of a few days' malaise, with possibly a sore throat and a slight rise of temperature before the onset of the abdominal pain. It is for treatment of this pain that the child is sent to hospital. The general appearance of the child when first seen often suggests scarlet fever, with flushed face, circumoral pallor, strawberry tongue, and injected fauces. The tonsils may be definitely infected. The respiration-rate is moderately raised, and examination of the chest commonly reveals an impaired percussion note with diminished air entry at the right base, and a pleural rub in the axillary line.

The abdominal pain is usually of a colicky type and is very variable in site and in intensity. Tenderness may be found anywhere in the abdomen, with a preference for the right side, but does not show any definite localisation to McBurney's point. The variability of the pain and tenderness is such a feature of the disease that, by the time the physician has called the surgeon, the picture may have changed from a right-sided to a left-sided lesion, or vice versa. Vomiting, and even nausea, are by no means constantly present, and guarding of the abdominal wall is very rare. Rectal examination sometimes reveals glands large enough to be felt on the anterior surface of the upper third of the sacrum.

The temperature tends to be rather high, and tallies better with the general appearance of the patient than with the severity of the abdominal signs. It falls gradually to normal in 2–3 days, and by then all the abdominal symptoms will have subsided. A few signs may remain in the chest for about a week, but at the end of that time the child is usually well, and can be discharged from hospital in 12–14 days. If an operation is done, a flare-up of the chest symptoms is to be expected. The 28 children who were followed up had remained quite well for periods ranging from 3 to 26 months after discharge from hospital, and, up to the time of final examination, had had no further attacks of abdominal pain.

OPERATIVE FINDINGS

If laparotomy is performed, the most striking finding is a more or less gross enlargement of the mesenteric glands, which are bright pink, firm, and discrete. The adenitis is most pronounced in the glands of the ileocæcal angle, but it is usually possible to palpate glands all the way up the mesentery. Injection and thickening of the appendix is present in varying degrees, and the naked-eye appearance of the cut surface of the appendix suggests a thickening of the submucous coat. The few appendices that we had sectioned did, in fact, show a submucous lymphatic hyperplasia. Appendicular obstruction was present only in the one patient quoted above, who had appendicectomy performed on her second admission to hospital. About a third of the cases had a small amount of clear fluid in the peritoneal cavity. Occasionally the terminal ileum was thickened and apparently œdematous.

DISCUSSION

We have been stimulated to report these cases because we are convinced that they are examples of a not very uncommon disease which is not always easy to distinguish from acute appendicitis in children, but, unlike appendicitis, is much better not treated by operation. Several descriptions of acute non-specific abdominal adenitis appeared in the American journals in the years immediately before the 1939–45 war. The main interest of the descriptions revolved round the difficulties of distinguishing the disease from conditions requiring urgent surgical treatment. The colicky nature of the pain is mentioned by all these writers, and McFadden (1927) had previously noted it. The indefinite localisation of the tenderness is repeatedly emphasised. We agree with Ian Aird (1945) that in practice the distinction from acute appendicitis is easier than a written description of the signs and symptoms can suggest. Most writers, Aird among them, have found that the attacks of pain are multiple and recur at intervals over a year or more. Our experience is that there is very seldom any previous history of abdominal pain.

While Adams and Olney (1938), Rosenberg (1937), and Foster (1938) were as impressed as we were with the frequency of infections of the upper respiratory tract as an associated factor in acute lymphadenitis, none of them mentions the chest complications which were a striking feature of our cases and have influenced all our conclusions on treatment.

It is now generally recognised that acute appendicitis, whether in children or in adults, is an acute appendicular obstruction, and that early operation is essential and life-saving. It is therefore a responsibility to insist that there is an acute abdominal condition in children which does not require operation; but we are convinced that only in one of our cases was anything gained by operation, and that the children who did not have their abdomens opened had on the whole a much less serious illness than those on whom appendicectomy was performed. Acute appendicular obstruction is characterised by the sequence of acute onset of central abdominal pain, vomiting, and tenderness localised to the right iliac fossa. In the few cases of abdominal lymphadenitis in which the tenderness remained definitely localised to the right iliac fossa, we felt that we had no choice but to operate. Despite further experience of lymphadenitis, there will still be cases in which fear of missing an obstructive lesion, which may have supervened on the inflammatory condition, will lead us to decide on laparotomy. We believe that the risk of collapse or consolidation of the lung complicating the infection of the respiratory tract is a very definite reason for avoiding operation in every possible case. When the decision has been made not to operate, no treatment is necessary beyond warmth and a light diet, with rest in bed, and possibly sulphonamide insufflations of the throat. Sulphonamides by mouth were given in many of our cases but did not affect the course of the illness, except when pneumonia was present.

The cause of acute abdominal lymphadenitis is not known. The white-cell counts exclude glandular fever. Various observers have had glands sectioned. McFadden believed that the cause of the adenitis was probably infection by the bovine tubercle bacillus with a superimposed condition such as acidosis. American writers, on the other hand, have been convinced of its non-tuberculous nature, and Ian Aird (1945), in his recent report from the Royal Edinburgh Hospital for Sick Children, is most emphatic that the condition is non-tuberculous and that to label it tuberculous is wrongly to prejudice the child's future. We have seen no reason to suspect tuberculosis in any of our cases, and the subsequent history of the patients is strong presumptive evidence against a tuberculous origin for the adenitis. In 17 cases we took swabs from the pharynx, and from 10 of these hæmolytic streptococci were grown; in 5 *Streptococcus viridans* only was grown. In 2 cases no pathogenic organisms were found. The abdominal glands were sent for culture in a few cases, and in some the peritoneal fluid also. No growth was obtained in any case.

Histological examination of the glands and of the appendix has shown a non-specific acute or subacute inflammatory lesion. It seems possible that the glandular inflammation is due to a virus infection, and that complicating this (perhaps activating it) is a pharyngeal streptococcal infection. Of this hypothesis we have, of course, no proof. Ian Aird suggests a virus infection as the most likely cause.

It is interesting to speculate on the common occurrence of a right-sided chest lesion. The direction of the mesenteric attachment may favour spread of the infection to the right cupola of the diaphragm, and thence to the right pleural membrane.

CONCLUSIONS

Acute abdominal lymphadenitis in children is a clinical entity.

The outstanding features of the disease are colicky abdominal pain, simulating appendicular colic, but varying in intensity and associated with shifting tenderness; pharyngitis, sometimes accompanied by cervical adenitis, often with flushed facies, circumoral pallor, and a strawberry tongue; diminished air entry at the base of the right lung and a pleural rub.

Surgical intervention is contra-indicated in the majority of cases, but hospital treatment is advisable because the disease does carry with it a slight but definite risk of the supervention of an obstructive lesion of the appendix.

Consolidation of the lung is very likely to follow operation.

It is suggested that the cause of the adenitis is infection by a virus, and that the coexistence of a streptococcal infection of the upper respiratory tract precipitates the acute abdominal syndrome.

We wish to thank Dr. J. L. Dunlop, M.O.H. to Hertfordshire County Council, for permission to publish the account of these cases.

REFERENCES

Adams, W. E., Olney, M. B. (1938) *Ann. Surg.* 107, 359.
Aird, I. (1945) *Brit. med. J.* ii, 680.
Foster, A. K. (1938) *Arch. Surg., Chicago*, 36, 28.
McFadden, G. D. F. (1927) *Brit. med. J.* ii, 1174.
Rosenberg, S. (1937) *Arch. Surg., Chicago*, 35, 1931.

ARTIFICIAL PNEUMOPERITONEUM
AS AN EMERGENCY MEASURE IN SEVERE HÆMOPTYSIS

A. J. Benatt
M.D. Berlin
E.M.S. PHYSICIAN, CENTRAL MIDDLESEX COUNTY HOSPITAL

Since pneumoperitoneum has been introduced into the treatment of pulmonary tuberculosis and is now being used on a wider and more systematic scale than before, its value in dealing with severe hæmoptysis may be illustrated by two cases of different type.

Case 1.—A married woman, aged 30, a known case of pulmonary tuberculosis with positive sputum, was first treated in this hospital in January, 1944, for severe hæmoptysis, which ceased within a few days. She was readmitted in May, 1944, again with severe hæmoptysis. She coughed up almost a quart of blood the first day, and daily amounts of 6–20 oz. during the ensuing eighteen days. On the second day of admission her hæmoglobin was 65% (10·2 g.) and her blood-sedimentation rate 88 mm. in the first hour. Routine measures (ice-bags, codeine, and sedatives) either did not stop the hæmorrhage or had only a very temporary effect. Radiography showed a right apical lesion including several very small cavities.

On the eighteenth day, as the bleeding was still severe and the patient looked extremely pale, an artificial pneumoperitoneum of 750 c.cm. of air was induced below the left costal margin. Within an hour the hæmoptysis ceased, and it did not recur in the ensuing two months. During this period pneumoperitoneum refills were continued weekly until she was transferred to a sanatorium. Radiography showed a rise of $3^1/_2$ in. of the right and 2 in. of the left diaphragm. Her Hb gradually rose to 92% (14·3 g.) and within four weeks her blood-sedimentation rate fell to 25 mm. in the first hour. There was no abnormality of bleeding-time, clotting-time, prothrombin level, or platelet count.

Case 2.—A married woman, aged 48, had ten years' history of cough, a fair amount of purulent sputum, and frequent hæmoptyses. She was previously suspected of having pulmonary tuberculosis, but numerous sputum tests were negative. On admission she said that a month previously she had coughed up about a pint of frank blood, and since then a daily quantity of blood sufficient to fill a sputum flask of 6–8 oz. A few days before admission the hæmorrhage became more severe and remained so for the first four days. Radiography showed much displacement of the heart and trachea to the left. There appeared to be a small area of fibrosis in the right upper zone and small multiple cavities throughout the left upper and mid zones. A dense shadow in the left lower zone was mainly due to the displaced heart. Several sputum tests were again negative. Left upper- and mid-zone bronchiectasis was eventually diagnosed.

For four days the routine treatment for hæmoptysis was unsuccessful. An artificial pneumoperitoneum of 800 c.cm. of air was induced as an emergency measure. The copious bleeding ceased the same day, and on the subsequent days there was only a small amount of blood mingled with the sputum, until on the tenth day after induction the sputum was free from any trace of blood. The pneumoperitoneum was continued with two refills in the first week and subsequent weekly refills of 800 c.cm. for another eight weeks.

Artificial pneumoperitoneum for severe hæmoptysis was first applied by Vajda (1933) in two cases of pulmonary tuberculosis. Since the recommendation of its wider use in the treatment of pulmonary tuberculosis, with a simple technique, by Clifford-Jones and Macdonald (1943), it has become known that the risk of complications is so small that this measure should be considered whenever the hæmorrhage is severe and does not respond to the usual routine treatment. Simmonds (1946), describing the hazards of artificial pneumoperitoneum, pointed out that in over 13,000 refills there were only 9 accidents, such as air-embolism and mediastinal emphysema; to these a small number of peritoneal effusions should be added. In contrast to this, an emergency artificial pneumothorax requires initially a large quantity of air to bring about an adequate collapse of the lung to stop the bleeding; but, if adhesions are present, as they commonly are, this will entail the danger of a tension pneumothorax with subsequent formation of fluid. Apart from this, an induction is often impracticable owing to an inadequate pleural space. Moreover, pneumoperitoneum can be induced without definite knowledge about the side from which the hæmorrhage originates, an assessment which is often difficult. In tuberculosis, pneumoperitoneum can be maintained by weekly refills; in bronchiectasis, however, the induction of air into the peritoneal cavity should be regarded simply as an emergency measure and should be stopped after the bleeding has ceased.

REFERENCES

Clifford-Jones, E., Macdonald, N. (1943) *Tubercle, Lond.* 24, 97.
Simmonds, F. A. H. (1946) *Lancet*, i, 530.
Vajda, L. (1933) *Z. Tuberk.* 67, 371.

POISONING BY D.D.T. EMULSION

REPORT OF A FATAL CASE

K. BIDEN-STEELE
M.D. Lond., D.P.H.
H.M. MEDICAL INSPECTOR
OF FACTORIES

R. E. STUCKEY
Ph.D. Lond., F.R.I.C., Ph.C.
DEPUTY DIRECTOR, HOME OFFICE
LABORATORY, PRESTON

ON March 19, 1946, a market-gardener's labourer, aged 32, was found dead at the entrance to some mushroom-growing sheds, the circumstances of the death being such that an inquest was held.

The man, who had been seen alive and well by his employer at 8.15 A.M., was found dead an hour later, lying on his face, and by his side was a small quantity of vomit. The only recent medical history was a complaint of stomach trouble and insomnia some three weeks earlier which had been diagnosed as functional dyspepsia; otherwise he was in good health. In the shed outside which he was found was a partly used 2-gallon drum of D.D.T. concentrated emulsion, some of which he had drunk.

At the necropsy, performed on the day of death, there were abrasions on the bridge of the nose and over the left eye, and the lungs were congested, the air spaces being filled with hæmorrhagic frothy fluid—i.e., a condition of pulmonary congestion. The stomach, which was dilated, contained ½ pint of fluid, consisting of partly digested food—the whole smelling strongly of the D.D.T. emulsion. The mucosa of the stomach and upper part of small intestine was congested. No other abnormalities were found.

The D.D.T. emulsion was intended for spraying mushrooms and had to be diluted 400 times before use. The deceased had presumably poured the emulsion from a 2-gallon can into a small jug, from which he had drunk it. There was a small quantity of vomit on the floor of the shed where the deceased was found, and this contained slightly less than ½ oz. of emulsion. The stomach contents, on analysis, contained about 6 oz. of the concentrated emulsion. This emulsion contained 20% of D.D.T. dissolved in methylcyclohexanone (40%). It is unlikely that any considerable amount of the emulsion would have been absorbed by the stomach in the short time elapsing before death. There were relatively small amounts of paraffin hydrocarbons present together with emulsifying agents. It was considered, however, that in view of their nature and the relatively small proportions present, these constituents did not play any part in causing death. We calculate that the total quantities of D.D.T. and methylcyclohexanone taken were at least 34 g. and 2·4 oz. (by weight) respectively, these being the amounts found in the stomach. *It is estimated that the deceased weighed 148 lb., indicating a concentration of 500 mg. of D.D.T. per kg. of body-weight.*

DISCUSSION

There is little doubt that this man died of drinking about 6 oz. of concentrated D.D.T. emulsion, and this was the verdict returned by the coroner. Death may have been due to the D.D.T. or the methylcyclohexanone, or both acting in combination.

D.D.T. was present in a concentration of 500 mg. per kg. of body-weight. The lethal dose for man and animals has been estimated to lie between 150 and 600 mg. per kg. of body-weight (Hill 1946). In necropsies on a negro child and on baboons pulmonary œdema was a constant finding (Hill and Robinson 1945). In our case pulmonary congestion was an outstanding feature of the necropsy. Hill and Robinson also report incoördination and paralysis of the legs immediately preceding death. In our case, from the position of the body—lying on the face and near the poison—it is reasonable to suppose that the poison acted quickly, paralysing the man's legs and pitching him on his face; and the paucity of the vomit suggests that unconsciousness supervened rapidly.

The solution of D.D.T. in fatty oils is stated definitely to increase its toxicity; but the effects of solutions in cyclohexanone are not necessarily comparable to those of oily solutions (United States Public Health Service 1944).

Methylcyclohexanone is not a recognised industrial poison, and no cases of poisoning by it have been described. Experiments on animals, with various concentrations in air, show irritative effects (Lehmann and Flury 1943). Naturally enough, data on the effect of taking methylcyclohexanone by mouth are lacking. Perhaps the nearest chemical parallel about which information is available is another saturated ketone (also an irritant)—acetone. Acetone in doses of 15–20 g. given daily for several days produced no ill effects (Browning 1938). The congestion of the mucosa of the stomach and upper part of the small intestine might be explained by the local action of the solvent.

Accepting the lethal dose given above, sufficient D.D.T. was swallowed to have caused death. From the recorded death of a baboon (Hill 1946) within 45 min. of taking D.D.T. by mouth, it appears by analogy that the amount of D.D.T. taken in our case could have explained respiratory failure in less than an hour. In the absence of precise data on the toxicity of methylcyclohexanone taken by mouth, the balance of evidence seems to suggest that death was due primarily to the D.D.T., though there can be little doubt that the solvent assisted the toxic action of this compound.

While Adams and Olney (1938), Rosenberg (1937), and Foster (1938) were as impressed as we were with the frequency of infections of the upper respiratory tract as an associated factor in acute lymphadenitis, none of them mentions the chest complications which were a striking feature of our cases and have influenced all our conclusions on treatment.

It is now generally recognised that acute appendicitis, whether in children or in adults, is an acute appendicular obstruction, and that early operation is essential and life-saving. It is therefore a responsibility to insist that there is an acute abdominal condition in children which does not require operation; but we are convinced that only in one of our cases was anything gained by operation, and that the children who did not have their abdomens opened had on the whole a much less serious illness than those on whom appendicectomy was performed. Acute appendicular obstruction is characterised by the sequence of acute onset of central abdominal pain, vomiting, and tenderness localised to the right iliac fossa. In the few cases of abdominal lymphadenitis in which the tenderness remained definitely localised to the right iliac fossa, we felt that we had no choice but to operate. Despite further experience of lymphadenitis, there will still be cases in which fear of missing an obstructive lesion, which may have supervened on the inflammatory condition, will lead us to decide on laparotomy. We believe that the risk of collapse or consolidation of the lung complicating the infection of the respiratory tract is a very definite reason for avoiding operation in every possible case. When the decision has been made not to operate, no treatment is necessary beyond warmth and a light diet, with rest in bed, and possibly sulphonamide insufflations of the throat. Sulphonamides by mouth were given in many of our cases but did not affect the course of the illness, except when pneumonia was present.

The cause of acute abdominal lymphadenitis is not known. The white-cell counts exclude glandular fever. Various observers have had glands sectioned. McFadden believed that the cause of the adenitis was probably infection by the bovine tubercle bacillus with a superimposed condition such as acidosis. American writers, on the other hand, have been convinced of its non-tuberculous nature, and Ian Aird (1945), in his recent report from the Royal Edinburgh Hospital for Sick Children, is most emphatic that the condition is non-tuberculous and that to label it tuberculous is wrongly to prejudice the child's future. We have seen no reason to suspect tuberculosis in any of our cases, and the subsequent history of the patients is strong presumptive evidence against a tuberculous origin for the adenitis. In 17 cases we took swabs from the pharynx, and from 10 of these hæmolytic streptococci were grown; in 5 *Streptococcus viridans* only was grown. In 2 cases no pathogenic organisms were found. The abdominal glands were sent for culture in a few cases, and in some the peritoneal fluid also. No growth was obtained in any case.

Histological examination of the glands and of the appendix has shown a non-specific acute or subacute inflammatory lesion. It seems possible that the glandular inflammation is due to a virus infection, and that complicating this (perhaps activating it) is a pharyngeal streptococcal infection. Of this hypothesis we have, of course, no proof. Ian Aird suggests a virus infection as the most likely cause.

It is interesting to speculate on the common occurrence of a right-sided chest lesion. The direction of the mesenteric attachment may favour spread of the infection to the right cupola of the diaphragm, and thence to the right pleural membrane.

CONCLUSIONS

Acute abdominal lymphadenitis in children is a clinical entity.

The outstanding features of the disease are colicky abdominal pain, simulating appendicular colic, but varying in intensity and associated with shifting tenderness; pharyngitis, sometimes accompanied by cervical adenitis, often with flushed facies, circumoral pallor, and a strawberry tongue; diminished air entry at the base of the right lung and a pleural rub.

Surgical intervention is contra-indicated in the majority of cases, but hospital treatment is advisable because the disease does carry with it a slight but definite risk of the supervention of an obstructive lesion of the appendix.

Consolidation of the lung is very likely to follow operation.

It is suggested that the cause of the adenitis is infection by a virus, and that the coexistence of a streptococcal infection of the upper respiratory tract precipitates the acute abdominal syndrome.

We wish to thank Dr. J. L. Dunlop, M.O.H. to Hertfordshire County Council, for permission to publish the account of these cases.

REFERENCES

Adams, W. E., Olney, M. B. (1938) *Ann. Surg.* 107, 359.
Aird, I. (1945) *Brit. med. J.* ii, 680.
Foster, A. K. (1938) *Arch. Surg., Chicago,* 36, 28.
McFadden, G. D. F. (1927) *Brit. med. J.* ii, 1174.
Rosenberg, S. (1937) *Arch. Surg., Chicago,* 35, 1931.

ARTIFICIAL PNEUMOPERITONEUM
AS AN EMERGENCY MEASURE IN SEVERE HÆMOPTYSIS

A. J. BENATT
M.D. Berlin
E.M.S. PHYSICIAN, CENTRAL MIDDLESEX COUNTY HOSPITAL

SINCE pneumoperitoneum has been introduced into the treatment of pulmonary tuberculosis and is now being used on a wider and more systematic scale than before, its value in dealing with severe hæmoptysis may be illustrated by two cases of different type.

CASE 1.—A married woman, aged 30, a known case of pulmonary tuberculosis with positive sputum, was first treated in this hospital in January, 1944, for severe hæmoptysis, which ceased within a few days. She was readmitted in May, 1944, again with severe hæmoptysis. She coughed up almost a quart of blood the first day, and daily amounts of 6–20 oz. during the ensuing eighteen days. On the second day of admission her hæmoglobin was 65% (10·2 g.) and her blood-sedimentation rate 88 mm. in the first hour. Routine measures (ice-bags, codeine, and sedatives) either did not stop the hæmorrhage or had only a very temporary effect. Radiography showed a right apical lesion including several very small cavities.

On the eighteenth day, as the bleeding was still severe and the patient looked extremely pale, an artificial pneumoperitoneum of 750 c.cm. of air was induced below the left costal margin. Within an hour the hæmoptysis ceased, and it did not recur in the ensuing two months. During this period pneumoperitoneum refills were continued weekly until she was transferred to a sanatorium. Radiography showed a rise of $3^1/_2$ in. of the right and 2 in. of the left diaphragm. Her Hb gradually rose to 92% (14·3 g.) and within four weeks her blood-sedimentation rate fell to 25 mm. in the first hour. There was no abnormality of bleeding-time, clotting-time, prothrombin level, or platelet count.

CASE 2.—A married woman, aged 48, had ten years' history of cough, a fair amount of purulent sputum, and frequent hæmoptyses. She was previously suspected of having pulmonary tuberculosis, but numerous sputum tests were negative. On admission she said that a month previously she had coughed up about a pint of frank blood, and since then a daily quantity of blood sufficient to fill a sputum flask of 6–8 oz. A few days before admission the hæmorrhage became more severe and remained so for the first four days. Radiography showed much displacement of the heart and trachea to the left. There appeared to be a small area of fibrosis in the right upper zone and small multiple cavities throughout the left upper and mid zones. A dense shadow in the left lower zone was mainly due to the displaced heart. Several sputum tests were again negative. Left upper- and mid-zone bronchiectasis was eventually diagnosed.

For four days the routine treatment for hæmoptysis was nsuccessful. An artificial pneumoperitoneum of 800 c.cm. f air was induced as an emergency measure. The copious leeding ceased the same day, and on the subsequent days here was only a small amount of blood mingled with the putum, until on the tenth day after induction the sputum was free from any trace of blood. The pneumoperitoneum was continued with two refills in the first week and subsequent weekly refills of 800 c.cm. for another eight weeks.

Artificial pneumoperitoneum for severe hæmoptysis was first applied by Vajda (1933) in two cases of pulmonary tuberculosis. Since the recommendation of its wider use in the treatment of pulmonary tuberculosis, with a simple technique, by Clifford-Jones and Macdonald (1943), it has become known that the risk of complications is so small that this measure should be considered whenever the hæmorrhage is severe and does not respond to the usual routine treatment. Simmonds (1946), describing the hazards of artificial pneumoperitoneum, pointed out that in over 13,000 refills there were only 9 accidents, such as air-embolism and mediastinal emphysema; to these a small number of peritoneal effusions should be added. In contrast to this, an emergency artificial pneumothorax requires initially a large quantity of air to bring about an adequate collapse of the lung to stop the bleeding; but, if adhesions are present, as they commonly are, this will entail the danger of a tension pneumothorax with subsequent formation of fluid. Apart from this, an induction is often impracticable owing to an inadequate pleural space. Moreover, pneumoperitoneum can be induced without definite knowledge about the side from which the hæmorrhage originates, an assessment which is often difficult. In tuberculosis, pneumoperitoneum can be maintained by weekly refills; in bronchiectasis, however, the induction of air into the peritoneal cavity should be regarded simply as an emergency measure and should be stopped after the bleeding has ceased.

REFERENCES

Clifford-Jones, E., Macdonald, N. (1943) *Tubercle, Lond.* **24**, 97.
Simmonds, F. A. H. (1946) *Lancet*, **i**, 530.
Vajda, L. (1933) *Z. Tuberk.* **67**, 371.

POISONING BY D.D.T. EMULSION

REPORT OF A FATAL CASE

K. BIDEN-STEELE
M.D. Lond., D.P.H.
H.M. MEDICAL INSPECTOR OF FACTORIES

R. E. STUCKEY
Ph.D. Lond., F.R.I.C., Ph.C.
DEPUTY DIRECTOR, HOME OFFICE LABORATORY, PRESTON

ON March 19, 1946, a market-gardener's labourer, aged 32, was found dead at the entrance to some mushroom-growing sheds, the circumstances of the death being such that an inquest was held.

The man, who had been seen alive and well by his employer at 8.15 A.M., was found dead an hour later, lying on his face, and by his side was a small quantity of vomit. The only recent medical history was a complaint of stomach trouble and insomnia some three weeks earlier which had been diagnosed as functional dyspepsia; otherwise he was in good health. In the shed outside which he was found was a partly used 2-gallon drum of D.D.T. concentrated emulsion, some of which he had drunk.

At the necropsy, performed on the day of death, there were abrasions on the bridge of the nose and over the left eye, and the lungs were congested, the air spaces being filled with hæmorrhagic frothy fluid—i.e., a condition of pulmonary congestion. The stomach, which was dilated, contained $^1/_2$ pint of fluid, consisting of partly digested food—the whole smelling strongly of the D.D.T. emulsion. The mucosa of the stomach and upper part of small intestine was congested. No other abnormalities were found.

The D.D.T. emulsion was intended for spraying mushrooms and had to be diluted 400 times before use. The deceased had presumably poured the emulsion from a 2-gallon can into a small jug, from which he had drunk it. There was a small quantity of vomit on the floor of the shed where the deceased was found, and this contained slightly less than $^1/_2$ oz. of emulsion. The stomach contents, on analysis, contained about 6 oz. of the concentrated emulsion. This emulsion contained 20% of D.D.T. dissolved in methylcyclohexanone (40%). It is unlikely that any considerable amount of the emulsion would have been absorbed by the stomach in the short time elapsing before death. There were relatively small amounts of paraffin hydrocarbons present together with emulsifying agents. It was considered, however, that in view of their nature and the relatively small proportions present, these constituents did not play any part in causing death. We calculate that the total quantities of D.D.T. and methylcyclohexanone taken were at least 34 g. and 2·4 oz. (by weight) respectively, these being the amounts found in the stomach. It is estimated that the deceased weighed 148 lb., indicating a concentration of 500 mg. of D.D.T. per kg. of body-weight.

DISCUSSION

There is little doubt that this man died of drinking about 6 oz. of concentrated D.D.T. emulsion, and this was the verdict returned by the coroner. Death may have been due to the D.D.T. or the methylcyclohexanone, or both acting in combination.

D.D.T. was present in a concentration of 500 mg. per kg. of body-weight. The lethal dose for man and animals has been estimated to lie between 150 and 600 mg. per kg. of body-weight (Hill 1946). In necropsies on a negro child and on baboons pulmonary œdema was a constant finding (Hill and Robinson 1945). In our case pulmonary congestion was an outstanding feature of the necropsy. Hill and Robinson also report incoördination and paralysis of the legs immediately preceding death. In our case, from the position of the body—lying on the face and near the poison—it is reasonable to suppose that the poison acted quickly, paralysing the man's legs and pitching him on his face; and the paucity of the vomit suggests that unconsciousness supervened rapidly.

The solution of D.D.T. in fatty oils is stated definitely to increase its toxicity; but the effects of solutions in cyclohexanone are not necessarily comparable to those of oily solutions (United States Public Health Service 1944).

Methylcyclohexanone is not a recognised industrial poison, and no cases of poisoning by it have been described. Experiments on animals, with various concentrations in air, show irritative effects (Lehmann and Flury 1943). Naturally enough, data on the effect of taking methylcyclohexanone by mouth are lacking. Perhaps the nearest chemical parallel about which information is available is another saturated ketone (also an irritant)—acetone. Acetone in doses of 15–20 g. given daily for several days produced no ill effects (Browning 1938). The congestion of the mucosa of the stomach and upper part of the small intestine might be explained by the local action of the solvent.

Accepting the lethal dose given above, sufficient D.D.T. was swallowed to have caused death. From the recorded death of a baboon (Hill 1946) within 45 min. of taking D.D.T. by mouth, it appears by analogy that the amount of D.D.T. taken in our case could have explained respiratory failure in less than an hour. In the absence of precise data on the toxicity of methylcyclohexanone taken by mouth, the balance of evidence seems to suggest that death was due primarily to the D.D.T., though there can be little doubt that the solvent assisted the toxic action of this compound.

While Adams and Olney (1938), Rosenberg (1937), and Foster (1938) were as impressed as we were with the frequency of infections of the upper respiratory tract as an associated factor in acute lymphadenitis, none of them mentions the chest complications which were a striking feature of our cases and have influenced all our conclusions on treatment.

It is now generally recognised that acute appendicitis, whether in children or in adults, is an acute appendicular obstruction, and that early operation is essential and life-saving. It is therefore a responsibility to insist that there is an acute abdominal condition in children which does not require operation; but we are convinced that only in one of our cases was anything gained by operation, *and that the children who did not have their abdomens* opened had on the whole a much less serious illness than those on whom appendicectomy was performed. Acute appendicular obstruction is characterised by the sequence of acute onset of central abdominal pain, vomiting, and tenderness localised to the right iliac fossa. In the few cases of abdominal lymphadenitis in which the tenderness remained definitely localised to the right iliac fossa, we felt that we had no choice but to operate. Despite further experience of lymphadenitis, there will still be cases in which fear of missing an obstructive lesion, which may have supervened on the inflammatory condition, will lead us to decide on laparotomy. We *believe that the risk of collapse or consolidation of the* lung complicating the infection of the respiratory tract is a very definite reason for avoiding operation in every possible case. When the decision has been made not to operate, no treatment is necessary beyond warmth and a light diet, with rest in bed, and possibly sulphonamide insufflations of the throat. Sulphonamides by mouth were given in many of our cases but did not affect the course of the illness, except when pneumonia was present.

The cause of acute abdominal lymphadenitis is not known. The white-cell counts exclude glandular fever. Various observers have had glands sectioned. McFadden believed that the cause of the adenitis was probably infection by the bovine tubercle bacillus with a superimposed condition such as acidosis. American writers, on the other hand, have been convinced of its non-tuberculous nature, and Ian Aird (1945), in his recent report from the Royal Edinburgh Hospital for Sick Children, is most emphatic that the condition is non-tuberculous and that to label it tuberculous is wrongly to prejudice the child's future. We have seen no reason to suspect tuberculosis in any of our cases, and the subsequent history of the patients is strong presumptive evidence against a tuberculous origin for the adenitis. In 17 cases we took swabs from the pharynx, and from 10 of these hæmolytic streptococci were grown; in 5 *Streptococcus viridans* only was grown. In 2 cases no pathogenic organisms were found. The abdominal glands were sent for culture in a few cases, and in some the peritoneal fluid also. No growth was obtained in any case.

Histological examination of the glands and of the appendix has shown a non-specific acute or subacute inflammatory lesion. It seems possible that the glandular inflammation is due to a virus infection, and that complicating this (perhaps activating it) is a pharyngeal streptococcal infection. Of this hypothesis we have, of course, no proof. *Ian Aird suggests a virus infection* as the most likely cause.

It is interesting to speculate on the common occurrence of a right-sided chest lesion. The direction of the mesenteric attachment may favour spread of the infection to the right cupola of the diaphragm, and thence to the right pleural membrane.

CONCLUSIONS

Acute abdominal lymphadenitis in children is a clinical entity.

The outstanding features of the disease are colicky abdominal pain, simulating appendicular colic, but varying in intensity and associated with shifting tenderness; *pharyngitis, sometimes accompanied by* cervical adenitis, often with flushed facies, circumoral pallor, and a strawberry tongue; diminished air entry at the base of the right lung and a pleural rub.

Surgical intervention is contra-indicated in the majority of cases, but hospital treatment is advisable because the disease does carry with it a slight but definite risk of the supervention of an obstructive lesion of the appendix.

Consolidation of the lung is very likely to follow operation.

It is suggested that the cause of the adenitis is infection by a virus, and that the coexistence of a streptococcal infection of the upper respiratory tract precipitates the *acute abdominal* syndrome.

We wish to thank Dr. J. L. Dunlop, M.O.H. to Hertfordshire County Council, for permission to publish th account of these cases.

REFERENCES

Adams, W. E., Olney, M. B. (1938) *Ann. Surg.* 107, 359.
Aird, I. (1945) *Brit. med. J.* ii, 680.
Foster, A. K. (1938) *Arch. Surg., Chicago*, 36, 28.
McFadden, G. D. F. (1927) *Brit. med. J.* ii, 1174.
Rosenberg, S. (1937) Arch. Surg., Chicago, 35, *1931.*

ARTIFICIAL PNEUMOPERITONEUM

AS AN EMERGENCY MEASURE IN SEVERE HÆMOPTYSIS

A. J. BENATT
M.D. Berlin
E.M.S. PHYSICIAN, CENTRAL MIDDLESEX COUNTY HOSPITA

SINCE pneumoperitoneum has been introduced int the treatment of pulmonary tuberculosis and is no being used on a wider and more systematic scale tha before, its value in dealing with severe hæmoptysis ma be illustrated by two cases of different type.

CASE 1.—A married woman, aged 30, a known case of pu monary tuberculosis with positive sputum, was first treate in this hospital in January, 1944, for severe hæmoptysi which ceased within a few days. She was readmitted in Ma 1944, again with severe hæmoptysis. She coughed up almo a quart of blood the first day, and daily amounts of 6–20 o during the ensuing eighteen days. On the second day admission her hæmoglobin was 65% (10·2 g.) and her bloo sedimentation rate 88 mm. in the first hour. Routi measures (ice-bags, codeine, and sedatives) either did not sto the hæmorrhage or had only a very temporary effect. Radi graphy showed a right apical lesion including several ve small cavities.

On the eighteenth day, as the bleeding was still seve and the patient looked extremely pale, an artificial pneum peritoneum of 750 c.cm. of air was induced below the le costal margin. Within an hour the hæmoptysis ceased, and did not recur in the ensuing two months. During this peri pneumoperitoneum refills were continued weekly until s was transferred to a sanatorium. Radiography show a rise of 3$^1/_2$ in. of the right and 2 in. of the left diaphrag Her Hb gradually rose to 92% (14·3 g.) and within four wee her blood-sedimentation rate fell to 25 mm. in the first hou There was no abnormality of bleeding-time, clotting-tim prothrombin level, or platelet count.

CASE 2.—A married woman, aged 48, had ten years' histo of cough, a fair amount of purulent sputum, and freque hæmoptyses. She was previously suspected of having pu *monary tuberculosis*, but *numerous* sputum tests we negative. On admission she said that a month previous she had coughed up about a pint of frank blood, and sin then a daily quantity of blood sufficient to fill a sputu flask of 6–8 oz. A few days before admission the hæmorrha *became more* severe and remained so for the first four da Radiography showed much displacement of the heart a trachea to the left. There appeared to be a small area fibrosis in the right upper zone and small multiple caviti throughout the left upper and mid zones. A den shadow in the left lower zone was mainly due to the di placed heart. Several sputum tests were again negativ Left upper- and mid-zone bronchiectasis was eventual diagnosed.

Preliminary Communication

RENAL PATHOLOGY IN THE LIGHT OF RECENT NEUROVASCULAR STUDIES

IN September last, one of us stated[1] that the renal anoxia found in a number of pathological conditions was probably "the result of overstimulation of the vascular nerves" and that, with certain colleagues, he had lately begun "what we hope will be a full-scale experimental study of the effects of direct, central, and reflex stimulation of vascular nerves upon the various organs of the body"; in the next sentence he specifically mentioned the kidney, and this is the organ in which we have hitherto more particularly studied the vascular effects of these various types of nerve-stimulation.

A preliminary printed account of our principal findings was pre-circulated to members of the Physiological Society in connexion with our demonstration made to the society on June 15, 1946.[2]

In brief, we have shown that with appropriate nerve-stimulation, both in animals with the abdomen *unopened* and in those in which the kidneys have been exposed, the renal blood-flow may be diverted from its commonly accepted course, and that as a result the cortex may be partly or wholly deprived of its supply.

The first evidence of this was the most striking as it was obtained, by *radiographic* means, in the *intact* animal. For we found that (as a result of the application of a tourniquet for a number of hours to the left hind-limb) the left renal circuit-time was shortened by virtually a half, though the calibre of the renal artery was at the same time reduced by a quarter. The only explanation of these simultaneous effects was, in our view, a vascular short-circuiting.

Further evidence of such short-circuiting was obtained in laparotomised animals after various types of nerve-stimulation:

(1) The blue colour of the blood in the renal vein changed partially or wholly to red. In some animals the appearance of the red blood was observed to be accompanied by pulsation of arterial type.

(2) Red streamlines appeared in the renal vein after the cortex had paled and while it still remained pallid.

(3) Dyes injected into the arterial side of the circulation appeared in the renal vein but did not stain the surface of the kidney (fig. 1c). On section, the cortex was seen to be unstained while the medulla, and especially its subcortical part, was deeply coloured by the dye (fig. 1*d*). This was in marked contrast to the right unstimulated kidney in which both cortex and medulla were stained, the former more deeply than the latter (figs. 1*a*, 1*b*). The same information has been obtained by radiographic methods (fig. 2).

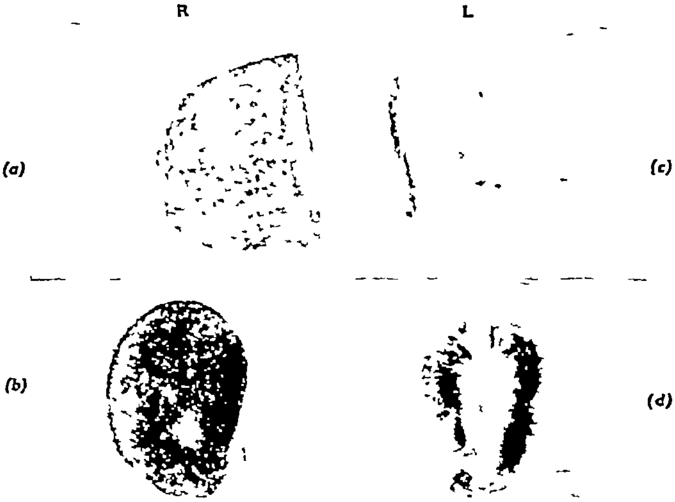


Fig. 1—Photographs of right and left kidneys after prolonged stimulation of the central end of the divided left sciatic nerve; dye injected directly into the renal arteries. (*a*) Right kidney: the dye has come to the surface. (*b*) Right kidney: on section, the dye has perfused throughout. (*c*) Left kidney: the dye has not reached the surface. (*d*) Left kidney: on section, part of the medulla is deeply stained but the dye has not reached the cortex.

The above observations show that as a result of appropriate nerve-stimulation the blood may be diverted wholly or partly from the cortex and short-circuited through medullary (especially subcortical) blood-channels. The large potential capacity of these by-passing channels enables them to transmit the whole of the renal blood

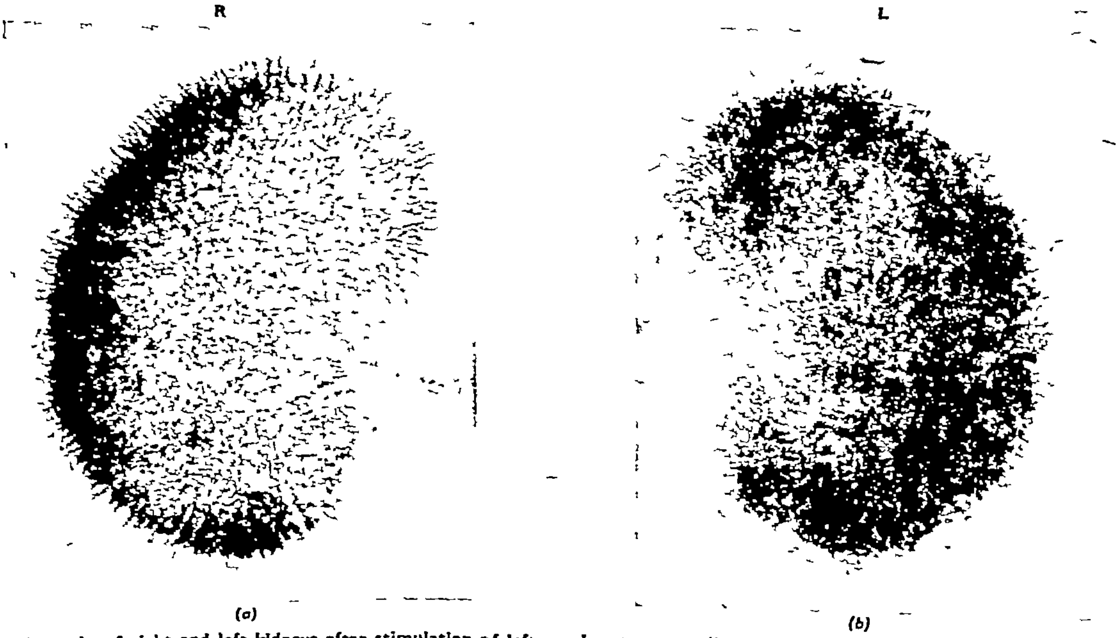


Fig. 2—Radiographs of right and left kidneys after stimulation of left renal artery; radio-opaque substance injected into the abdominal aorta above the renal arteries. (*a*) Right kidney, showing the vascular supply extending to the cortex. (*b*) Left kidney: the vascular supply has failed to reach the cortex.

---

[1] Trueta, J. *Lancet*, 1945, ii, 415.

[2] This account was accepted at the meeting and will appear in the September number of *Journal of Physiology*.

SUMMARY

A labourer swallowed, in its concentrated form, with fatal results, 6 oz. of D.D.T. emulsion intended to be diluted 400 times.

The necropsy showed pulmonary and gastro-intestinal congestion.

Our thanks are due to Dr. A. K. P. Tobin, of Formby, who performed the necropsy; and to the information service of the Factory Department.

REFERENCES

Browning, E. (1938) Toxicity of Industrial Organic Solvents, New York.
Hill, K. R. (1946) *Brit. med. J.* i, 255.
— Robinson, G. (1945) *Ibid*, ii, 845.
Lehmann, K. B., Flury, F. (1913) Toxicology and Hygiene of Industrial Solvents, Baltimore.
United States Public Health Service (1944) *Publ. Hlth Rep., Wash.* suppl. 177.

TROPICAL EOSINOPHILIA IN EGYPT

REPORT OF A CASE

EDOUARD STEPHAN
M.D. Beirut
PHYSICIAN TO THE SUEZ CANAL COMPANY, ISMAILIA; LECTURER, FRENCH FACULTY OF MEDICINE, BEIRUT

So far as we know only two cases of tropical eosinophilia have been recorded outside India. Emerson (1944) described one in America in a man of 30 who developed it 8 months after his return from India, after his resistance had been lowered by a severe intercurrent infection (abscess of the liver). Parsons-Smith (1944) reported a case which developed in Egypt, but unfortunately he did not state whether his patient had previously been to India or in contact with Indians. The following case shows that tropical eosinophilia is not limited to India, because the patient had not left the Middle East since 1913.

CASE-RECORD

A Syrian dental surgeon, aged 52, had gone, when aged 18, on a journey to Ceylon, Australia, and America, where he graduated at Pennsylvania. Four years later (1913) he settled in Cairo and never travelled again, except to Lebanon for his summer holidays. He had severe typhoid in 1931.

From 1936 to 1942 he experienced every year a moderate chronic pyrexia of 99·5°–101° F, beginning in May and disappearing in August after rest and fresh air in the Lebanese mountains or in Alexandria. Hæmatological examinations for brucellosis, malaria, and enteric fevers were always negative.

In February, 1942, the fever started again, followed two or three weeks later by "asthmatic bronchitis," with nocturnal paroxysmal cough, dyspnœa, and orthopnœa. He usually obtained some relief from adrenaline, lobelia, and potassium iodide. In the winter of 1943 the paroxysmal attacks were so frequent and severe, both by day and by night, that he retired from his practice.

In June, 1943, he was first examined and thoroughly investigated by me. He was then dyspnœic, pale, and obese. Temperature 99·5°–101° F. Attacks of severe paroxysmal *coughing, with regular nightly exacerbations. The attacks* differed from asthma by the absence of wheezing and expiratory distress; they were relieved by the expectoration of purulent nummular sputum. Chest not barrel-shaped but slightly hyper-resonant. Expiration prolonged. Few rhonchi; widespread sibilant chiefly expiratory râles; numerous moist râles, expiratory and inspiratory, over the lower lobes. No distinctive abnormalities of the chest radiogram except exaggerated hilar and vascular branching shadows. Heart normal. Spleen not enlarged. Liver of normal size. Blood-pressure 130/75 mm. Hg.

The most acceptable diagnosis at the time seemed to be *severe chronic asthmatic bronchitis in an obese patient;* but the fever and constitutional upset could not be attributed solely to chronic asthmatic bronchitis, and there was no satisfactory explanation of the leucocytosis (24,000 per c.mm.), almost exclusively due to normal mature eosinophils. The patient was given symptomatic treatment and kept under observation.

On reading Weingarten's (1943) article in May, 1944, I examined the patient again and noted the following details: red cells 4,500,000 per c.mm., Hb 90%; white cells 21,000 per c.mm. (neutrophils 27%, mononuclears 2%, lymphocytes 15%, eosinophils 56%); sputum viscid, hyaline, and contained pearled translucent particles; no tubercle bacilli, spirilla, or spirochætes present; few eosinophils. Blood Wassermann and Kahn reactions negative. Blood-urea 0·056%. No parasites in the stools.

A course of acetarsol was started on May 29: 0·25 g. for four days followed, after two days' rest, by a daily dose of 0·50 g. until 13 g. had been given. At this point complaints of numbness and weakness of the limbs obliged me to stop the drug. Further attempts to resume it met with the same complaints. The accompanying table shows the white-cell counts immediately before, during, and after the acetarsol treatment, *the dates of treatment being shown in italics.*

The second and third counts show an increase in the total white cells, chiefly due to the rise in eosinophils. This transient increase corresponds to a period, from June 3 to June 11, during which the clinical signs and symptoms were perhaps the worst in the whole illness; this period followed the first three days of acetarsol administration. Improvement began on the nights of June 13 and 14, when the attacks of coughing were much less frequent and severe, and for the first time the patient slept calmly without orthopnœa (for the last two years he could only sleep propped up in a half-sitting position). On June 30 he had no symptoms and signs, except fever which persisted for five more days, after which he regained normal health.

Date	White cells per c.mm.	Neut. %	Mono. %	Lymph. %	Eosin. %
May 29	21,500	23	1	16	60
June 3	24,000	23	2	20	55
„ *9*	25,000	23	2	18	57
„ *17*	12,000	36	5	28	31
„ *21*	8800	41	5	26	28
„ 24	9200	59	7	20	14
Aug. 26	12,000	51	8	26	15
Sept. 11	9000	53	10	27	10

DISCUSSION

This case conforms with Weingarten's description (1943), except for the absence of splenomegaly and the long duration of the fever, which continued throughout the illness, being the first symptom to arise and the last to disappear. The persistence of a mild eosinophilia despite complete clinical cure is probably related to inadequate dosage of acetarsol.

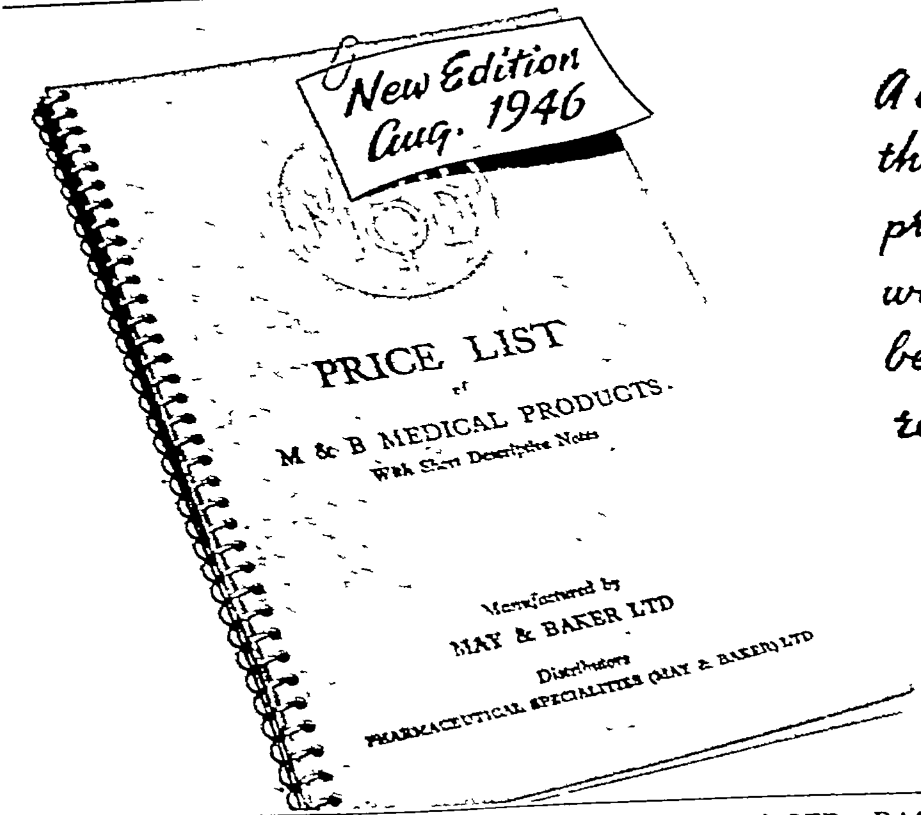
The patient had not left the Middle East since 1913. His journey to Ceylon and Australia 33 years ago can hardly be relevant. Hence it appears that the disease was acquired in Egypt. Further studies will show to what extent tropical eosinophilia is prevalent there. White-cell counts should be done in cases of "chronic bronchitis" and "chronic asthmatic bronchitis" accompanied by much constitutional upset, and arsenical treatment should be given in cases showing a high leucocytosis due to an increase of eosinophils.

I wish to thank Dr. Farid Tabet, of Cairo, for carrying out all the laboratory investigations and Captain G. de Chalus-Heath for translating my paper.

REFERENCES

Emerson, K. jun. (1944) *U.S. nav. med. Bull., Wash.* **42**, 118.
Parsons-Smith, B. G. (1944) *Lancet*, i, 433.
Weingarten, R. S. (1943) *Ibid*, i, 103.

"... I do believe, and few experienced men would differ from me, that one-third of all our students are ill-fitted, or unfitted, for university work. There is yet another matter which is more serious still, and makes, to my mind, a greater change since I was young: and that is the way men come to the university, not for the love and joy of learning, but for the business of passing an exam. They do not hitch their wagon to a star as so many of my old companions did; they only want a degree, and a job. In short, we have plenty of undergraduates, but a sad lack of students."—Sir D'ARCY THOMPSON, F.R.S., professor of natural history, University of St. Andrews, in the *Times*, Aug. 9.



A copy of this new price list will gladly be sent on request.

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM, ENGLAND

9159

Vasodilatation

There is considerable evidence of the outstanding value of Cardophylin in producing vasodilatation. The coronary vasodilatation is manifested in an increased coronary blood flow and a beneficial effect on the myocardium; the renal vasodilatation is indicated by the powerful diuresis, while its antispasmodic action appears to be largely the result of the bronchodilatation induced by the drug

Cardophylin

A SPECIALLY PREPARED COMPOUND OF THEOPHYLLINE-ETHYLENEDIAMINE

INDICATIONS

DISEASES OF THE CARDIOVASCULAR SYSTEM · OEDEMA · ASTHMA

LITERATURE AND SAMPLES ON REQUEST

IN TABLETS FOR ORAL USE, AMPOULES AND SUPPOSITORIES

MANUFACTURED BY **WHIFFEN & SONS LIMITED · CARNWATH ROAD · FULHAM · LONDON · S.W.6.**

inflow whenever the supply to the cortex is diverted and the latter thereby rendered ischæmic.

To locate the by-passing channels histologically, particulate material was injected in place of dyes, and was found to fill vasa recta and their loops, as well as a subcortical plexus of vessels (also of very much more than capillary calibre), suggesting that these two sets of vessels were the anatomical channels involved. These histological studies are being continued.

The above researches, then, show that in the experimental animal a renal circulation can be continued through the medulla whilst the cortex is functionally ischæmic. We may fittingly conclude this section by noting that under such conditions the flow of urine in the ureter decreases or may be entirely suppressed.

IMPLICATIONS

The result of the experimental work described above makes us stress the great importance of a mechanism by which a temporary or permanent cortical ischæmia may be produced without arrest of the renal circulation. In many of the conditions in which anuria is found, lesions in the cortex interpreted as being due to ischæmia are constantly present, and in addition the medulla is found to be congested. An explanation for these lesions can be found in the neurovascular mechanism demonstrated in our experimental animals. It seems that nerve-stimulation could be produced centrally or peripherally by *a variety of noxious agents and that the* picture seen in many loosely related syndromes—e.g., "sulpha kidney," incompatible-transfusion kidney, Weil's disease, and some forms of nephritis—is the result of a defence device by which the cortex of the kidney is excluded from the circulating toxin or other noxious agent, and thus protected. Too prolonged operation of the device results in permanent damage.

The same protective mechanism may fulfil another rôle in hæmorrhage and shock or conditions with decreased blood-volume by preventing the blood from reaching the filter of the kidney (the cortex) and thus conserving fluid.

The concept of a functional change-over, under various conditions, to a medullary renal circulation has obvious physiological, pathological, and clinical implications. For instance, the interpretation of renal function tests must be reconsidered. The pathology of hysterical uræmia, emotional anuria, and post-abortum and post-traumatic uræmia, and the response of these last two to splanchnic block, are readily explained.

Lastly, we believe that hypertension may be the result of disordered activity of some nerve-centre or centres, from which impulses are sent to the same vascular effector-organs as are involved in the cortical ischæmia and medullary congestion described by us above.

We hope to publish a full account of our work as soon a possible in book form.

We wish to acknowledge a grant received from the Medica Research Council towards the expenses of our experimenta work.

J. Trueta
M.D. Barcelona
D.Sc. Oxfd

A. E. Barclay
O.B.E., M.D. Camb., D.M. Oxfd
F.R.C.P., D.M.R.E.

P. Daniel
M.A., M.B. Camb.

K. J. Franklin
D.M. Oxfd, F.R.C.P.

M. M. L. Prichard, M.A.
Nuffield Institute for Medical Research, Oxford.

Reviews of Books

Cerebral Angiography with Perabrodil

Arne Engeset. Oslo: *Acta Radiologica*. Supplement LVI. Pp. 207. Sw. cr. 25.

Since Egas Moniz introduced cerebral angiography in 1927 there have been many important contributions, though none more important than his own. The present monograph, beautifully printed and produced, gives an account of 68 cases at the Oslo University neurosurgical and neurological clinics in the departments of Torkildsen and Monrad-Krohn. Case-histories are brief, but prints showing the angiographic appearances of the series are well reproduced. There is a useful review of previous work, though, as the author says, war-time conditions made it impossible for him to consult a number of journals, and this has led to a few striking omissions. German work is well covered, as is only natural. There is a brief review of methods and of opinions on angiography and on the cerebral circulation. Cerebral arterial and venous patterns cannot be interpreted correctly unless the clinician has a good knowledge of congenital variants as well as normal appearances. He has still to learn by experience what is abnormal by disease and in what way it is so. The book is decidedly helpful, for the reproductions of the radiograms are large and clear, as is the rule with the publications of *Acta Radiologica*. The contrast medium used in this series was 'Perabrodil.' Engeset was not afraid of the radioactivity of thorotrast but believed that perabrodil would give better filling of small vessels, especially those in brain tumours themselves. He thinks that this has been the case, and certainly several of the figures show tumour types differentiated by the varying small-vessel patterns. The X-ray exposures were made after injections of 2–6 c.cm. of perabrodil. Percutaneous angiography is discussed, but not in great detail, though the method has been considerably developed in the Oslo clinic.

DDT, the Synthetic Insecticide

T. F. West, M.SC., PH.D. Lond., F.R.I.C.; G. A. Campbell, M.SC. Leeds, F.R.I.C. London: Chapman and Hall. Pp. 301. 21*s*.

The index and the lists of references in this book indicate how much research has been done in the few years since D.D.T. was found to be so insecticidal; and information is still accumulating. The book is divided into two parts: the first deals with the chemical and physical attributes of D.D.T. and the different formulations and processes in which it can be incorporated; the second reviews the results of experimental work from the biological angle. Body lice and mosquitoes each receive separate attention and there are chapters on household pests, other pests affecting man and animals, and plant pests. This arrangement is convenient, but within the chapters the pests are arranged in alphabetical order according to their common English names. Thus Onion eel-worm follows Mustard beetle, and Snails find themselves between Small plant bug and Southern army worm. In the chapter on D.D.T. in paints, where the authors give the results of some of their own experiments rather large tables are erected to house rather small numbers of insects. In general, however, the information is carefully and judiciously summarised, and they have provided a useful handbook for anyone engaged in pest control.

Roentgen Diagnosis of Diseases of the Gastrointestinal Tract

John T. Farrell, jun., M.D., clinical professor of radiology Graduate School of Medicine, University of Pennsylvania London: Baillière. Pp. 271. 30*s*.

This volume is a condensed index of the radiology of the intestinal tract, comparable to a pocket-anatomy and intended to emphasise the vital points which students must know. It tabulates Professor Farrell's techniques and the approach to diagnosis by deduction, being based on notes that have been issued to students as a skeleton outline on which to build their experience into knowledge. Logical sequence of technique and observation are the lessons stressed, and the reader meets them on every page; moreover, the author employs the "Standard Nomenclature of Disease," making his book fit four-square into this excellent pattern. The book is well produced and the large bold type invites the reader to peruse the text and not merely to turn over the pages and study the illustrations. Some of these unfortunately are not of the highest standard, but in spite of this all students of gastro-enterology will find the book of value not only for examination purposes but for quick reference.

THE LANCET

LONDON: SATURDAY, AUGUST 17, 1946

The Lesser Circulation of the Kidney

Fresh light is shed on our conception of renal function by current work at Oxford, summarised in a preliminary communication from Trueta, Barclay, Franklin, Daniel, and Prichard on p. 237, and circulated at a recent meeting of the Physiological Society.[1] Their investigations began in attempts to explain the mechanism of crush syndrome; and, having demonstrated that a nervous reflex profoundly alters the renal blood-flow, they proceeded by a series of experiments, which need not be recounted here, to disclose the existence of a delicately balanced alternative circulation through the cortex and the medulla respectively. The vascular architecture of the cortex is sufficiently complicated to be still the subject of anatomical investigation, although it has been intensively studied for many years. The arrangement and functions of the vasa recta, on the other hand, have been relatively neglected; though, displaying wisdom after the event, it may now be admitted that the peculiar leash-like disposition of these wide vascular loops in the medulla is not one that appears primarily related to the nutrient requirements of the tubules of that part Their most important function seems to lie in the provision of an alternative route for the blood flowing through the kidney, whereby the important cortical circulation may, to a variable degree, be shut down This functional conception has important physiological and pathological implications. Thus it becomes understandable how physiological diminutions in urinary output may be adjusted—for example, when large amounts of fluid are being eliminated from the body by other routes—without greatly diminishing the blood-flow through the kidney. It provides an explanation for the sudden cessation of diuresis in dogs subjected to an emotional stress[2] since the medullary bypass is under nervous control This inhibition of diuresis was not demonstrated when the splanchnic nerves had previously been cut, and the kidneys denervated The only obvious alternative explanation of these observations would be to suppose that the sole change lay in constriction of the cortical vessels, with resulting ischæmia. But this would mean that the vascular bed, through which a quarter of the blood-output of the heart flows, is suddenly cut out of the circulation From this a sudden and dramatic rise in blood-pressure might be expected, unless a bypass were provided to take this extra volume of blood. There is no record of such a rise in blood-pressure. It is therefore reasonable to suppose that, during active diuresis, the cortical circulation is fully open, while in anuria the medullary circulation is in action and the cortical circulation is thus bypassed.

For pathologists this may well be the key to many conundrums A certain type of renal lesion common to a variety of conditions, such as the crush syndrome, incompatible blood-transfusion, blackwater fever, and renal failure complicating abortion—to name the best known of them—is now generally recognised, and has been frequently described of late years. In these kidneys there are variable degrees of tubular degeneration and necrosis in the cortex; the cortex as a whole is relatively anæmic, though the interlobular veins may be engorged, while the vasa recta are conspicuously engorged; the presence of large numbers of pigmented casts within the tubules, especially the collecting tubules in the medulla, completes the main features of the picture. It is of interest to recall that Shaw Dunn and Montgomery[3] observed, in a heterogeneous group of cases showing renal cortical necrosis, that the arrest of circulation was incomplete in the proximal parts of the interlobular arteries "owing to easier escape of blood through deep glomeruli whose efferents pass by short routes direct to the medulla and not to the cortical rete." Evidence has been collected pointing to an anoxic mechanism in the production of this picture, and the term "renal anoxia" has been coined for it by B G. Maegraith In the letter by Maegraith and R E. Havard published in our last issue the belief is clearly expressed that, in this syndrome, there is "some redistribution of the blood-flow within the kidney . . . it is unlikely that the dynamics of the renal circulation will be elucidated until better techniques enable us to study the living functioning organ" This prophecy has been speedily fulfilled: the anoxia results from the shunting of blood from the cortex to the medulla. Supporting evidence from the angle of treatment is provided in the recent report by O'Sullivan and Spitzer[4] of a series of cases of acute renal failure complicating abortion. Two of the most serious of these were cured by a bilateral posterior splanchnic block, according to the method of Kappis. In both the response was dramatic, though in one the operation was at first ineffective and had to be repeated after six days, when the patient appeared moribund. This method of treatment, which according to O'Sullivan and Spitzer was first introduced by Neuwirth in 1922, is manifestly deserving of further trial in these cases of anuria.

Much remains to be learnt concerning the stimuli that deflect the renal blood from the cortex to the medulla, and the transitions that turn a physiological into a pathological process. The incidence of anoxic cortical changes, of the kind that have been mentioned, in such diverse conditions as sulphonamide therapy, *Clostridium welchii* infections, and burns suggests that certain toxins can initiate the reflex, which serves to protect the cortical elements from damage. We know nothing as yet of those minor adjustments of the renal circulation that are unattended by pathological sequelæ, but we may be justified in regarding the pathological examples as cases where a protective mechanism has been called too drastically into operation.

---

1. *J. Physiol.* (in the press).
2. O'Connor, W. J., Verney, E. B. *Quart. J. exp. Physiol.* 1945, 33, 77.
3. Dunn, J. S., Montgomery, G. L. *J. Path. Bact.* 1941, 52, 1.
4. O'Sullivan, J. V., Spitzer, W. *J. Obstet. Gynæc.* 1946, 53, 158.

K—before confinement

● Haemorrhage of the newborn, a serious cause of neo-natal mortality, is a preventable disease. The routine administration by mouth of vitamin K as late as 2 hours before delivery, by ensuring a safe prothrombin level in the mother, raises the foetal prothrombin reserves and normally safeguards the newborn infant against neo-natal haemorrhage.*

Failing this, the infant may be given vitamin K by mouth soon after birth.

The dosage is conveniently given by means of 'Kapilon' a vitamin K analogue :—for the mother one tablet (10 mg.), or 1 cc. (10 mg.): for the infant 0.25 to 0.5 cc. (2.5 to 5 mg.) diluted in oil to 1 cc.

*Brit. Med. J., (1945) June 16, 862.

PRODUCT OF THE GLAXO LABORATORIES

KAPILON

VITAMIN K ANALOGUE

Tablets, 25; 100. Ampoules, 6 x 1 cc.: Liquid, ½ oz., 8 oz

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

For fungus infections

● Prevalent under conditions of overcrowding, fungus *infections may spread with the Summer* growth *of facilities* for sport and bathing. 'Mersagel' jelly is already established for the treatment and prophylaxis of such ringworm conditions as 'athlete's foot' and dhobie itch. 'Mersagel' consists of phenyl mercuric acetate—a powerful fungicide in a water-soluble jelly base. Its fungicidal powers in other sites than the skin (e.g. vaginal mucous membrane in monilia vaginitis*) have been favourably reported upon.

* *Investigation and Results of Treatment of 1,000 cases of vaginal discharge. B.M.J., I, 509, 1945 (April 14th).*

PRODUCT OF THE GLAXO LABORATORIES

MERSAGEL

PHENYL MERCURIC ACETATE (1 in 750)
1½ oz. and 16 oz.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

> "Several districts have isolated homes of good standard able to take semi-advanced cases in homes for incurables—e.g., Merseyside (women), Bristol, Bradford, Leicester; and the London hospitals find the existing homes for advanced cases in the London area very valuable. One report (Leeds) cites three city hospitals entirely occupied by chronic sick—983 beds in all—in two of which patients can get up and dress every day and go out; but the adequacy of the provision is not altogether borne out by other reports from the same area which state that accommodation is extremely lacking. Bristol notes the establishment of two hostels for elderly people and provision of meals by a mobile canteen. Bristol and Cardiff have home help schemes for households where there is illness, for a maximum of six weeks."

n a few places, notably Merseyside and Watford, onditions are said to be becoming more acceptable, nd at Oldham a new institution, built on modern ines and well equipped, is said to be popular among patients who would not consider going to the other ocal institutions. No other "good provisions," however, are recorded; the rest of the 16-page eport tells of bad provisions or none at all. The eputation of the service is bad; patients in extreme misery quite commonly refuse beds when they are offered, because they regard the conditions in chronic wards as intolerable—a prejudice which almoners cannot call ill founded:

> "The accommodation offered is in many instances in old, out-of-date buildings, quite unsuitable for the purpose of nursing patients who need especial care, in surroundings calculated as far as possible to give them confidence and cheer them in their last illness. They are usually old 'workhouses' built in some areas well off the beaten track, and consequently difficult of access. No attraction is offered to the right type of medical officer and nurse and no proper segregation of senile, chronic and dying patients is possible. Further they can seldom provide day accommodation for patients who can get up, and the only alternative for these patients is to remain in bed, losing what strength they have, and even in some instances the chance of their condition being sufficiently improved to remove them from the chronic category."

Unfortunately there is evidence that the treatment the chronic sick receive is often as grim as their quarters; and besides rough and depressing surroundings, with no arrangements for segregation of the insane and the dying, they are often—perhaps usually—given unattractive and unsuitable food.

Nevertheless those who find beds in institutions are in a sense fortunate. One dreadful story follows another, collected from all parts of the country, of people in the greatest possible need of skilled nursing and medical care—with fungating growths, in agony from metastases, incontinent, with cæcostomies, blind, or partly paralysed—living at home in unsuitable quarters cared for by an elderly or failing relative, by a young child, by neighbours in odd moments, or by nobody at all. In the whole of England and Wales only 10 homes intended primarily for the dying were reported. Though these—which mostly have a religious basis—are well run, they do not begin to solve the enormous problem; and moreover their name depresses patients and relatives, they are often difficult to get to, and they usually make no arrangements for patients who are still able to be up and about. Nursing-homes cannot be found under 5 guineas weekly; they have staffing problems, and give preference to acute cases. In many areas, especially in the North, there are no convalescent homes for patients with malignant disease for whom active treatment can do no more. In the few homes accepting such cases, incontinent patients and those with colostomies are nearly always rigidly excluded.

The almoners make plenty of suggestions for improving matters, many of them similar to those already put forward.[7] Better buildings and brighter surroundings are of course needed, and better means of segregating various types of patient. Smaller, scattered units are required in country districts so that patients can be near their homes and friends, and visiting times should be frequent, and arranged conveniently for the visitors. More homes are wanted on the lines of the Star and Garter Homes, where patients are encouraged to lead as normal a life as possible, with good treatment ready at hand. There should be wards and blocks for the chronic sick in the general hospitals, so that doctors and nurses in training learn about their care. In existing hospitals for the chronic sick the almoners think the first requirement is a great and early increase in the number of beds, so that advanced cases of malignant disease can be admitted without delay. The power to arrange admission should be transferred from the relieving officer to the local authority. "Better equipment, more homely conditions, room for personal possessions, no unnecessary rules, more small attentions and personal small comforts"—these are the things which the chronically sick specially deserve to help them to face their unhappy state.

Radioactive Isotopes

VALUABLE information about the supply of radioactive isotopes has now been given in *Science* in an announcement from Headquarters, Manhattan Project, Washington, D.C.[8] Since the end of the war, we learn, the staff there has begun to develop some of the peacetime potentialities of the uranium chain-reacting pile; but piles of special design may have to be built for efficient production of isotopes, and this will take time. The substances are created in these piles by (1) the fission of U235 nuclei, and (2) neutron absorption by non-fissionable nuclei placed within the pile. By means of these two processes a large number of fission products (about 25), ranging in half-life from a week to thirty years, is available in significant quantities. In the announcement six tables describe them—detailing their half-lives, the energies of their β and γ radiation, the probable contaminants, and the approximate maximum unit quantity available in curies, together with their products, which are often, though not always, radioactive. (It is not yet possible to supply concentrated stable isotopes.) No scale of charges is included, but it is suggested that a reasonable charge is "one based on the 'out-of-pocket' operational expenses necessitated by the non-project production and service program." The radioactive materials will not initially be distributed to private individuals but only to accredited institutions or organisations; and particulars of supply arrangements may be had from the isotopes branch of the Manhattan District Research Division. It should be remembered, however, that *Science* is an American publication, and it is possible that supplies will be restricted—at any rate for the present—to American workers. Naturally there is already a strong demand among our medical scientists for these important substances, and it is hoped here that this may be met from United States' resources until such time as the home plant at Harwell comes into production.

---

[7] See, for example, *Lancet*, 1946, i, 341, 857.

[8] *Science*, 1946, 103, 697.

Food for the Premature Baby

ABOUT half the babies who die during the first month of life are premature or immature, and two-thirds of these do not live more than twenty-four hours. High standards of antenatal and obstetric care are probably the only means of preventing these very early deaths. But the premature infant who survives more than twenty-four hours faces two further danger periods—in the second week, when feeding is particularly difficult, and later when the risk of infection is greatest[1]—and at these times good nutrition will not only favour survival but also reduce morbidity.

During the last few weeks of pregnancy the fœtus gains about 25 grammes (nearly 1 oz.) daily, and ideally the premature baby should do the same. In any newborn infant, however, there is bound to be a slackening of growth while the alimentary tract takes over from the placenta, and for the premature this transfer of function is apt to be harder, calling for skilful handling by his attendants. All premature babies lose weight at first, and few regain their birth-weight before the 10th day. Nevertheless from this time forward a regular gain in weight should be established, the aim being to give as much nourishment as can be comfortably tolerated. Human milk is generally considered the best food, both because it allows of a high calorie intake without much risk of gastro-intestinal disturbance and also because it confers a degree of immunity against infections. On breast-milk, according to LEVINE[2] and O'REILLY,[3] a daily weight gain of about 15 g. ($^1/_2$ oz.) can be expected after the first fortnight of life. Some workers, including HESS and LUNDEEN,[4] have, however, advised that the protein and mineral intake of premature infants fed on human milk should be augmented, and this has been done by giving up to a quarter of the daily feed as cow's milk, or by adding a dried casein supplement In the paper which we publish on another page Professor MAGNUSSON and his colleagues state their case in favour of a supplement consisting of an amino-acid mixture prepared from casein by hydrolysis, and describe their results with a Swedish preparation called 'Aminosol.' This preparation is completely soluble in water and does not form curd; so the full supplement (2·5 g. daily per kilogramme of body-weight) can be mixed with the feeds of human milk from the time of birth without risk of food intolerance. Comparisons of the amounts of weight gained by infants during weekly periods with and without the supplement show that a daily gain of about 30 g. (1 oz.) was achieved repeatedly with the amino-acid mixture, and that the gain was much less without it, approximating to the 15 g. gain on breast-milk alone obtained during the second fortnight by LEVINE[2] and O'REILLY.[3] The Swedish workers have also compared the effect of the amino-acid supplements with that of equivalent amounts of undigested casein, and report that the results were always in favour of the predigested protein. From this they deduce that the digestive processes of premature babies cannot fully cope with protein; but it is a little difficult t accept this conclusion in the light of LEVINE'S statement that the digestibility of protein is 85–90% even on high intakes (6 g. per kg. per day) of cow's milk protein. The experimental work on which these last figures seem to be based is a study of nitrogen absorption in three premature babies, aged 33–4 days, with average weights of 2·1–2·6 kg. (LEVINE and GORDON[5]), and if younger infants had been investigated the utilisation of protein might have been le satisfactory; for JORPES, MAGNUSSON, and WRETLIND have found that, as the infant becomes more mature, towards the end of the second month the effects of casein supplements approximate to those of hydrolysed casein. Nevertheless, from comparative feeding experiments, whose details have not yet been published, LEVINE and his co-workers have come t believe that cow's milk mixtures are preferable t human milk in the routine feeding of small and young premature infants, because protein is tolerated better than fat. They give the milk mixture in quantities to provide 150 c.cm. of fluid, 120 calories, 6 g. of protein, 18 g. of carbohydrate, and not more than 2·5 g. of fat, per kg. per day, and babies thus fed are said to gain more weight (25–30 g. daily, against 15–20 g.) and retain more nitrogen (0·3 g. per kg per day against 0·25 g.) than those fed on unmodified human milk.

Few authorities in this country would dare to recommend artificial feeding for young premature babies where human milk is to be had; but there seems to be no doubt that, whatever the food, a high protein intake is needed if a premature baby is to gain weight at the same sort of rate as it would have done in utero Nature's perfect food needs supplementing when the infant has been born before Nature intended. It is already widely recognised that a premature baby's requirements of minerals (iron and calcium) and vitamins are larger than those of the full-term infant, and this list must evidently be extended to include protein.

Neglect of the Chronic Sick

> " . . . a woman of 39 suffering from carcinoma of the cervix with incontinence of urine. The patient was treated with radium in 1940 since when she has been almost entirely confined to bed. She is separated from her husband and lives with a child aged 8, her mother an old-age pensioner, and a sister working as a cleaner. They live in a two-roomed house, all sleeping in one room, the patient in a bed to herself, the other three in another bed. The downstair room is used for living, cooking, and washing as there is not even a lean-to scullery. The lavatory is outside. The patient is mostly in bed but comes down for about an hou a day to sit in an armchair commode provided by the hospital. The case is well known to the M.O.H., but he seems unable to provide other accommodation."

And probably not only seems, but *is* unable to provide it. Cases like this are quoted in appalling profusion in a report just produced by the Institute of Almoners. Last January the institute sent out a questionary to its members, inquiring into the present care of the chronic sick, and especially of cases of malignant disease. Almoners were asked what care was offered in institutions in their areas. Few, it appears, could describe any existing good provisions whatever.

---

1. Parsons, L. G. *Lancet*, 1944, i, 267.
2. Levine, S. Z. *J. Amer. med. Ass.* 1945, 128, 283.
3. O'Reilly, J. N. *Proc. R. Soc. Med.* 1944, 38, 57.
4. Hess, J., Lundeen, E. C. The Premature Infant, Philadelphia, 1941.
5. Levine, S. Z., Gordon, H. H. *Amer. J. Dis. Child.* 1942, 64, 27
6. Results of an inquiry undertaken at the suggestion of Sir Ernes Rock Carling. Obtainable from the Institute of Almoners Tavistock House North, Tavistock Square, London, W.C.1.

> "Several districts have isolated homes of good standard able to take semi-advanced cases in homes for incurables—e.g., Merseyside (women), Bristol, Bradford, Leicester; and the London hospitals find the existing homes for advanced cases in the London area very valuable. One report (Leeds) cites three city hospitals entirely occupied by chronic sick—983 beds in all—in two of which patients can get up and dress every day and go out; but the adequacy of the provision is not altogether borne out by other reports from the same area which state that accommodation is extremely lacking. Bristol notes the establishment of two hostels for elderly people and provision of meals by a mobile canteen. Bristol and Cardiff have home help schemes for households where there is illness, for a maximum of six weeks."

In a few places, notably Merseyside and Watford, conditions are said to be becoming more acceptable, and at Oldham a new institution, built on modern lines and well equipped, is said to be popular among patients who would not consider going to the other local institutions. No other "good provisions," however, are recorded; the rest of the 16-page report tells of bad provisions or none at all The reputation of the service is bad; patients in extreme misery quite commonly refuse beds when they are offered, because they regard the conditions in chronic wards as intolerable—a prejudice which almoners cannot call ill founded:

> "The accommodation offered is in many instances in old, out-of-date buildings, quite unsuitable for the purpose of nursing patients who need especial care, in surroundings calculated as far as possible to give them confidence and cheer them in their last illness. They are usually old 'workhouses' built in some areas well off the beaten track, and consequently difficult of access. No attraction is offered to the right type of medical officer and nurse and no proper segregation of senile, chronic and dying patients is possible. Further they can seldom provide day accommodation for patients who can get up, and the only alternative for these patients is to remain in bed, losing what strength they have, and even in some instances the chance of their condition being sufficiently improved to remove them from the chronic category."

Unfortunately there is evidence that the treatment the chronic sick receive is often as grim as their quarters; and besides rough and depressing surroundings, with no arrangements for segregation of the insane and the dying, they are often—perhaps usually—given unattractive and unsuitable food.

Nevertheless those who find beds in institutions are in a sense fortunate. One dreadful story follows another, collected from all parts of the country, of people in the greatest possible need of skilled nursing and medical care—with fungating growths, in agony from metastases, incontinent, with cæcostomies, blind, or partly paralysed—living at home in unsuitable quarters cared for by an elderly or failing relative, by a young child, by neighbours in odd moments, or by nobody at all. In the whole of England and Wales only 10 homes intended primarily for the dying were reported. Though these—which mostly have a religious basis—are well run, they do not begin to solve the enormous problem; and moreover their name depresses patients and relatives, they are often difficult to get to, and they usually make no arrangements for patients who are still able to be up and about Nursing-homes cannot be found under 5 guineas weekly; they have staffing problems, and give preference to acute cases. In many areas, especially in the North, there are no convalescent homes for patients with malignant disease for whom active treatment can do no more. In the few homes accepting such cases, incontinent patients and those with colostomies are nearly always rigidly excluded.

The almoners make plenty of suggestions for improving matters, many of them similar to those already put forward.[7] Better buildings and brighter surroundings are of course needed, and better means of segregating various types of patient. Smaller, scattered units are required in country districts so that patients can be near their homes and friends, and visiting times should be frequent, and arranged conveniently for the visitors More homes are wanted on the lines of the Star and Garter Homes, where patients are encouraged to lead as normal a life as possible, with good treatment ready at hand. There should be wards and blocks for the chronic sick in the general hospitals, so that doctors and nurses in training learn about their care. In existing hospitals for the chronic sick the almoners think the first requirement is a great and early increase in the number of beds, so that advanced cases of malignant disease can be admitted without delay. The power to arrange admission should be transferred from the relieving officer to the local authority. "Better equipment, more homely conditions, room for personal possessions, no unnecessary rules, more small attentions and personal small comforts"—these are the things which the chronically sick specially deserve to help them to face their unhappy state.

Radioactive Isotopes

VALUABLE information about the supply of radioactive isotopes has now been given in *Science* in an announcement from Headquarters, Manhattan Project, Washington, D.C.[8] Since the end of the war, we learn, the staff there has begun to develop some of the peacetime potentialities of the uranium chain-reacting pile; but piles of special design may have to be built for efficient production of isotopes, and this will take time. The substances are created in these piles by (1) the fission of U235 nuclei, and (2) neutron absorption by nonfissionable nuclei placed within the pile. By means of these two processes a large number of fission products (about 25), ranging in half-life from a week to thirty years, is available in significant quantities. In the announcement six tables describe them—detailing their half-lives, the energies of their β and γ radiation, the probable contaminants, and the approximate maximum unit quantity available in curies, together with their products, which are often, though not always, radioactive. (It is not yet possible to supply concentrated stable isotopes.) No scale of charges is included, but it is suggested that a reasonable charge is "one based on the 'out-of-pocket' operational expenses necessitated by the non-project production and service program." The radioactive materials will not initially be distributed to private individuals but only to accredited institutions or organisations; and particulars of supply arrangements may be had from the isotopes branch of the Manhattan District Research Division. It should be remembered, however, that *Science* is an American publication, and it is possible that supplies will be restricted—at any rate for the present—to American workers. Naturally there is already a strong demand among our medical scientists for these important substances, and it is hoped here that this may be met from United States' resources until such time as the home plant at Harwell comes into production.

---

[7] See, for example, *Lancet*, 1946, i, 841, 857.
[8] *Science*, 1946, 103, 697.

Annotations

SIGNS OF MENINGITIS

INTEREST in meningitis has been reawakened in the last few years by the improved prognosis with sulpha drugs and penicillin; but the mechanism of the specific signs of meningeal irritation has remained obscure. These signs are stiffness of the neck, neck retraction, and at times opisthotonos, together with Kernig's sign and the two signs described by Brudzinski—flexion of hips and knees on passive flexion of the neck, and the "leg sign" of flexion of the opposite hip when Kernig's manœuvre is carried out. Previous explanations, such as those based on increased muscle irritability or tonic neck reflexes, are unconvincing.

O'Connell[1] has now suggested that the basis of all these signs is tension on the inflamed intradural nerve roots, and has produced anatomical evidence in support of this view. By dissection on the cadaver and accurate marking of corresponding points on the spinal theca and the vertebræ, he has shown that flexion of the neck causes a cephalad movement of the spinal cord and theca relative to the vertebral column. In the cervical region a movement of 5 mm. may take place when the head is moved from full extension to full flexion, with correspondingly increased tension in the nerve roots. Similarly Kernig's manœuvre causes increased tension in the extradural lumbosacral roots, caudal movement of the theca, and some increase in tension of the cauda equina. The signs of meningitis are due to reflex muscle contraction, whose purpose is to prevent this tension; neck rigidity and retraction prevent head flexion and subsequent stretching of the cervical roots; the hamstring spasm, which is the essential feature of Kernig's sign, prevents increased tension in the cauda equina; and the hip flexion, observed in Brudzinski's neck sign, produces partial relaxation of the increased tension due to flexion of the neck.

This explanation was originally suggested to O'Connell by his work on signs due to prolapse of a lumbosacral intervertebral disk,[2] where, in most cases, tension on a nerve root stretched over the disk protrusion seems a more reasonable explanation than compression of the nerve. The signs of Kernig and Lasègue are clinically identical, and the different names have been applied according to whether the patient was suffering from meningitis or sciatica; now they have been shown to have the same anatomical explanation—reflex muscle spasm to prevent increased tension on the lumbosacral nerve roots. The eponyms could surely be discarded and the manœuvre be called the "straight-leg raising test."

A VERSATILE CARCINOGEN

THE Yorkshire council of the British Empire Cancer Campaign[3] this year celebrates a coming-of-age with its two centres of research at Leeds and Sheffield in almost full production. At both the extraordinary properties of 2-acetylaminofluorene continue to be exploited. The value of this substance lies in the wide variety of organs in which it induces cancer when given by mouth, the variety of susceptible animals, and the variation in organ incidence between different strains of the same animal. Most of the experiments have been done on mice and rats, but in Sheffield a Rhode Island Red cock developed a kidney carcinoma and all of four cats had multiple lung tumours after taking aminofluorene. New growths produced in rats by painting it on the skin include papillomas, basal-cell carcinomas, and spindle-cell tumours of great malignancy, and it is the first carcinogenic chemical to which rat skin has responded regularly with tumour production. Adenocarcinomas of the sma intestine and mammary gland, and tumours of the duct acousticus, have previously been grown. In mice, carc nomas of the thyroid, squamous papillomas of the for stomach, a transitional carcinoma of the renal pelvi a squamous carcinoma of the cervix uteri, and tumou of bladder, liver, and mammæ have all appeared aft prolonged feeding. Both rats and mice reveal a strai difference in liability to the tumours. Piebald ra respond rarely with breast tumours, while 60% Wistar albinos develop them as a result of simple feedin 50% of piebalds grow adenocarcinomas of the sma intestine, but only 5% of the albinos. Among mice, conspicuous strain variation in all tumour incidence seen when aminofluorene is fed regularly by stomac tube. These observations provide additional evidence favour of the view expressed by Dr. Peyton Rous, in h Walker lecture,[4] that any hereditary influence in canc is the inheritance by certain individuals of a spec liability or responsiveness not to cancer but to one the causes of cancer.

Among much else of interest in the report, it may noted that in Sheffield mammary tumours, caused b methylcholanthrene in milk-factor-free mice, are sti being studied. The mammary-gland tumours of mic both those due to milk factor and those induced b chemicals, are being intensively examined by worke everywhere in the hope of reconciling or explaining t apparently divergent theories of cancer causation in th one organ of mice in which both can operate. Accordi to one group of American investigators[5] the action methylcholanthrene is a sequence started by focal inju succeeded by nodular proliferation and squamous met plasia. The neoplastic alteration takes place while t growth is still a nodule. An interpretation from Lee will be awaited eagerly

ERYTHROBLASTOSIS FŒTALIS AND ITS TREATMENT

ERYTHROBLASTOSIS fœtalis manifests itself in thr clinical forms[6]—as hydrops fœtalis, as icterus grav neonatorum, or as hæmolytic anæmia of the newbor These have in common an erythroblastæmia (primiti red cells in the peripheral blood), anæmia, and myelo infiltration of the organs, especially the liver. Man stillbirths have a similar histology. The hæmolyt basis of the condition, long suspected, was confirm by Levine and co-workers,[7] who showed in 1941 th the mothers of such infants were nearly always of t Rh-negative blood-group and that their serum oft contained an anti-Rh agglutinin, while the affect infants were Rh-positive, having derived the Rh antig of their red cells from the father. This finding has be abundantly confirmed. The conception is that t maternal antibody passes across the placental barri and reacts with the red cells of the fœtus. This vi has been supported by the work of Coombs and c leagues[8] who have demonstrated that the affected infant red cells are sensitised.

Infants with hydrops fœtalis, if not stillborn, die withi an hour or so of birth. At the other end of the sca infants with hæmolytic anæmia of the newborn oft recover spontaneously in a few months. Icterus grav neonatorum has an intermediate prognosis. On t basis that these conditions were the several manifestatio of a single hæmolytic process, blood-transfusion h been given an extensive therapeutic trial. On the ba the Rh incompatibility between mother and fœtus it as recommended early on by Levine and colleagues that hese infants be given Rh-negative blood. Mollison[9] onfirmed this recommendation when he showed that ransfused Rh-negative red cells survived normally in hese infants, while Rh-positive cells were eliminated nduly rapidly. Mollison's own cases and the series ublished by Gimson[10] suggested that by transfusion with Rh-negative blood the lives of many of these rythroblastotic infants could be saved. Cappell[11] in Scotland and American writers have also reported favourably on the prognosis for infants given Rh-negative blood. Nevertheless there is widespread disappointment at the esults of treatment, though this feeling is rarely expressed n print because few observers publish their failures. Kernicterus (damage to the cerebral basal nuclei) is not prevented by the transfusion treatment, and the mortality from icterus gravis is still high. Moreover, as Wallerstein[12] points out, many infants die though no evidence of severe anæmia exists. He attributes kerncterus and parenchymal damage of the liver cells,[13] &c., to toxæmia, the toxin arising from the stroma of lysed red cells. On the basis of this hypothesis he recommends venesection-transfusion. The blood is withdrawn from the sagittal sinus and Rh-negative blood is transfused by a cannula into a vein. By alternate withdrawals and transfusions of 50 c.cm. it is possible to leave the infant with only 25% of its own blood, the rest being the transfused Rh-negative blood. Three severe cases were so treated, and Wallerstein concludes that "The results to date justify a more widespread use of this method." Other clinicians have practised this venesection-transfusion, when the diagnosis of the infant has been made antepartum, by using the cannulated umbilical vessels. This procedure seems safer than the use of the sagittal sinus.

---

[1] O'Connell, J. E. A. *Brain*, 1946, 69, 9
[2] O'Connell, J. E. A. *Brit. J. Surg.* 1943, 30, 315.
[3] Report for 1945–46. From 5, Park Square, Leeds.
[4] *Lancet*, July 20, 1946, pp. 92, 93.
[5] Kirschbaum, A., Lane Williams, W., Bittner, J. *Cancer Resear* 1946, 6, 354.
[6] Diamond, L. K., Blackfan, K. D., Baty, S. M. *J. Pedia* 1932, 1, 269.
[7] Levine, P., Burnham, L., Katzin, E. M., Vogel, P. *Ame J. Obstet. Gynec.* 1941, 42, 925.
[8] Coombs, R. R. A., Mourant, A. E., Race, R. R. *Lancet*, 194 1, 264.

Wallerstein's practice may be sound, but his hypothesis that the major damage arises from the "toxins" of lysed red cells has no evidence to support it. Other hæmolytic processes, such as congenital acholuric jaundice, where stroma is liberated in excess of normal, do not lead to kernicterus or liver degeneration and necrosis. It seems more likely that the maternal antibody, after passing through the placenta and entering the fœtal circulation, can be absorbed not only by the red cells but also by the tissue cells. It was originally thought that the Rh antigen was present only in red cells, but Boorman and Dodd[14] claimed to have demonstrated this antigen in the parenchyma of liver, kidney, and salivary glands, and even in low strength in saliva; Witebsky and Mohn[15] claim to have found it in amniotic fluid. On the basis of these observations it is easy to see how tissue cells could be damaged by the appropriate antibody. If the red cells take up most of the antibody the main feature would be a hæmolytic anæmia amenable to treatment by blood-transfusion; if, on the other hand, the tissue cells absorb most of the antibody, icterus gravis, hydrops fœtalis, or stillbirth might result. In this connexion, Wiener[16] has sought to divide erythroblastosis fœtalis into two disease syndromes, dependent not on the fœtal antigen but on the type of the maternal antibody. Two such types of Rh antibody are recognised—the iso-agglutinin which in vitro agglutinates Rh-positive red cells, and the blocking or incomplete antibody which does not agglutinate Rh-positive red cells but uses up the receptors of those cells so that known agglutinating anti-Rh sera can no longer agglutinate the sensitised cells. Wiener postulates that a maternal blocking antibody causes congenital hæmolytic disease (with anæmia and/or hydrops) while a maternal iso-agglutinin leads to erythroblastosis (with icterus gravis and kernicterus). This hypothesis, however, is not supported by any factual evidence, and though attractive seems almost surely wrong. In Britain at any rate the antibody in the serum of mothers of infants with icterus gravis is as often of the incomplete as the complete variety.

From the therapeutic point of view, given an affected infant, one requires a means of removing the damaging agent or antibody. The fact that transfused Rh-positive red cells survive poorly shows that there is an excess of this antibody (even though it cannot be demonstrated) or that the antibody can be liberated from a sensitised red cell or tissue cell to attack more red cells. So far such a means has not been devised. Even more does one require a means for avoiding this process of maternal iso-immunisation and the resultant fœtal damage.

---

[9] Mollison, P. L. *Arch. Dis. Childh.* 1943, 18, 161.
[10] Gimson, J. D. *Brit. med. J.* 1943, ii, 293.
[11] Cappell, D. F. *Glasg. med. J.* November, 1944, p. 125.
[12] Wallerstein, H. *Science*, 1946, 103, 583.
[13] Gilmour, J. R. *Arch. Dis. Childh.* 1944, 19, 1.
[14] Boorman, K. E., Dodd, B. E. *J. Path. Bact.* 1943, 55, 329.
[15] Witebsky, E., Mohn, J. F. *J. exp. Med.* 1945, 82, 143.
[16] Wiener, A. S. *N.Y. St. J. Med.* 1946, 46, 912.

PERSISTENT ENURESIS

THE study of enuresis may be accounted dull and tiresome, but it may lead to discoveries about the physiology and pathology of micturition, quite apart from the more immediate hope of finding a cure for an affliction which is sometimes almost tragic. Stalker and Band[1] have lately made a thorough clinical investigation of 67 cases of enuresis, and the most obvious practical result of this is their confirmation of the finding that ephedrine is effective in treatment. They studied all the patients suffering from enuresis who were seen at the Jordanburn Nerve Hospital. These patients had all reached the age of puberty and were of both sexes (51 males and 16 females). All the usual psychiatric methods of treatment were tried first, but with little success. In adults the ephedrine treatment was started with $1^1/_2$ grains (of the hydrochloride, *B.P.*) at night, and the dose was increased every few nights, according to its effectiveness, to a maximum of 3 grains. Smaller doses were also given by day if necessary. Fluids were restricted in the evenings. Of the 55 patients so treated only 4 were classed as failures, but on the other hand 19 defaulted (a characteristic of enuretics) and 9 were still sub judice at the time of writing; so those improved comprised less than half the total treated. There were 8 cures. These results seem to justify the authors' conclusion that ephedrine is no panacea but gives better results than other remedies. Certain other investigators, however, such as Browne and Ford-Smith,[2] have found it ineffective, and the explanation of this discrepancy is not clear.

Radiological abnormalities of the lumbosacral spine were found in just over half the cases, and most commonly the lesion was confined to the first sacral vertebra. Interpretation of these findings is difficult, because widely differing figures are given by different authorities for the incidence of these variations in normal people. For this there are several possible explanations, and one of them is supported by some evidence in Stalker and Band's paper. They found that, whereas the incidence of lateral defects (such as sacralisation) was the same in all age-groups, midline defects (failure of neural-arch fusion) occurred mainly in the early age-groups, thus suggesting that ossification is continuing during these years. The first sacral arch is always the last to join, and Jemma's[3] assertion that it may not do so until the 20th or even the 30th year seems likely to be true. In other words a radiological gap in the first sacral arch may be of no significance at all before the age of 30. Furthermore, the radiological evidence should be supported by clinical findings before a diagnosis of spina bifida occulta is accepted. Such findings are rare; and were absent in this series.

---

[1] Stalker, H., Band, D. *J. ment. Sci.* 1946, 92, 324.
[2] Browne, R. C., Ford-Smith, A. *Brit. med. J.* 1941, ii, 803.
[3] Jemma, G., Le spine bifide, Naples, 1930.

Constitutional factors were shown to play an important part in the causation of enuresis, particularly the psychological background, both individual and familial. Half of Stalker and Band's patients had some definite psychiatric disorder (the commonest being a psychopathic state); another quarter suffered from a subclinical anxiety state; and even the remaining quarter, though allowed to be within normal limits, were regarded as having anxious personalities. These findings suggest two questions—to what extent does the bias of the investigator colour such an assessment, and may not the enuresis be the cause (not the effect) of the milder psychological upsets? The family history showed a high incidence of psychiatric conditions among relations, and inquiry for enuresis revealed "an average of almost two other affected persons per case." Stalker and Band make the point that nocturnal enuresis is not an isolated phenomenon but one aspect of a derangement of the pelvic autonomic system, and they support this assertion by showing that in the same patient there are often associated manifestations, such as nocturnal frequency (rising at night), diurnal frequency and urgency, sometimes diurnal enuresis, and more rarely encopresis. In their opinion the disorder is not an overactivity of the local reflexes but a weakness of the cerebral inhibition of these reflexes. An interesting extension of this line of autonomic inquiry leads to the question of sleep, which is a vegetative function and may well bear a close relation to nocturnal enuresis. They say that two-thirds of their patients were heavy sleepers. But here again depth of sleep is hard to assess and to compare, and the normal range must be taken into account. Maybe two-thirds of all young people are heavy sleepers.

Many other aspects of this difficult problem are conidered in this interesting paper, though no fresh ground is oken. Cystometry was done in 15 of the patients, but a utine measure of bladder capacity and of body-weight ould have been simpler and perhaps more revealing. or do we feel sure of the value of the statement that "enuresis is not just a symptom, but a disease in itself."

MORTALITY TRENDS IN DEGENERATIVE DISEASE

THIS century has seen a steady rise in the *crude* death-rate from the cardiovascular-renal diseases which now form a large proportion of the total mortality. The rise in the toll of degenerative disease has prompted alarmist warnings of the ultimate effects on physical health of the crescendo in the stress of modern life. A more cheering note is struck in a recent bulletin[1] of the Metropolitan Life Insurance Company in the United States. There, if anywhere, the tempo of life is at a maximum, but among the policy-holders of that company there has been since 1911 a consistent decline in the *standardised* death-rate from cardiovascular-renal disease. The main source of this disparity lies in the standardisation or adjustment of the death-rate to take into account the ageing of the population; but there is more to it than that. Even within each age-group there has been a real decline in the death-rate from these diseases, particularly among younger people (under 24) of both sexes, and for both white and coloured races. Since much of this type of disease is the aftermath of a much earlier infection, whether rheumatic or syphilitic, we are now reaping the benefits of therapeutic successes in the treatment of bacterial disease. Decreasing demands for physical effort, from men because of mechanisation in industry and from women because of less frequent childbearing, are no doubt having a beneficial effect. Policy-holders are clearly a self-selected section of the population—they presumably include the wealthier, more intelligent, and more provident members of society. Among them, then, one would expect to see the influence of better nutrition, better environmental conditions, and medical care in the prevention of premature physical breakdown.

However cheering this picture may be it must be remembered that the main advances have been made in the field of infective diseases and their consequences in heart and kidney. The more strictly degenerative diseases such as arteriosclerosis still constitute a major and growing problem. Stimulated no doubt by the success against bacterial disease, the American life-insurance companies have organised a research fund to study the causes of disease in heart and arteries. We too have an ageing population and we must hope that this fund will yield results which can be widely applied in the care of the aged.

CHEMOTHERAPEUTIC MISTS

AEROSOLS, long used as vehicles for expectorant and bronchodilator drugs, are finding a more important rôle in chemotherapy. Quantitative studies have shown that by this means sulphonamides and penicillin can be introduced into the lungs in amounts and concentrations adequate for therapeutic purposes[1]; absorption takes place rapidly, and the drugs quickly appear in the blood, but a useful proportion is retained by the bronchial secretions, and, on another page, Dr. Humphrey and Dr. Joules report identification of penicillin in the sputum as long as six hours after a single period of inhalation. One benefit from this form of topical treatment is that three-hourly intramuscular injections are replaced by the less exacting routine of three or four inhalations daily. Coarse aerosols deposit in the bronchi, but fine aerosols appear to follow the transalveolar route, by which the drug is conveyed directly to the left side of the heart. Knott and Southwell[2] found that the blood-concentration of penicillin may be ten times greater in the left ventricle than in the right—a notable consideration when extrapulmonary lesions are under treatment. Aerosols cannot penetrate consolidated lung, and in pneumonia become locally effective only after absorption and redistribution by the blood. Their therapeutic value in such circumstances has been assessed by Eleanor Bliss[3]; working on rats with experimental pneumococcal pneumonia, she found that penicillin administered by inhalation was at least as curative as similar amounts injected intramuscularly.

During the last two years numerous clinical trials have been carried out in this country and in America. In particular, much useful information is provided by the careful reports of Olsen[4] and now, on other pages of this issue, by those of Dr. Humphrey and Dr. Joules, and of Dr. Southwell. There is general agreement that in most cases of bronchiectasis the volume, odour, purulence, and bacterial content of the sputum can be strikingly reduced; and on several occasions the opinion has been expressed that penicillin inhalations given before and after lobectomy add materially to the safety of the operation. From this, and from the imposing miscellany of conditions treated by Barach,[5] Vermilye,[6] and others it seems probable that the method will be more widely employed. Penicillin may presently be replaced or fortified by substances which will widen the range of controllable micro-organisms, and the need for such an extension is emphasised by the observation of Humphrey and Joules that, with the *elimination* of penicillin-sensitive organisms, coliform bacilli appear, owing partly

---

[1] *Statist. Bull. Met. Life Ins. Co.* 1946, 27, 5.

[1] Mutch, N. *Lancet*, 1944, ii, 775. Mutch, N., Rewell, R. E. *Ibid*, 1945, i, 650.
[2] Knott, F. A., Southwell, H. *Arch. Dis. Childh.* 1946, 21, 16.
[3] Bliss, E. A. *Bull. Johns Hopk. Hosp.* 1945, 77, 411.
[4] Olsen, A. M. *Proc. Mayo Clin.* 1945, 20, 184.
[5] Barach, A. L., Silberstein, F. H., Oppenheimer, E. T., Hunter, T. H., Soroka, M. *Ann. intern. Med.* 1945, 22, 485.
[6] Vermilye, H. N. *J. Amer. med. Ass.* 1945, 129, 250.

unmasking but also, they consider, to an absolute
ease. Several sulphonamides have already been
ployed; streptomycin aerosol has been reported as
ctive against infection by *Hæmophilus influenzæ*,[7]
l 'Promanide' has been tried in pulmonary tuber-
osis.

Vhen bronchial drainage is defective, the benefits of
iicillin inhalation are quickly lost. In bronchiectasis
d chronic bronchitis, further courses are therefore
eded seasonally or from time to time. Acute infections
the nasopharynx and bronchi, however, respond
ickly, and it might be possible to prevent many of the
otic complications in the ear, sinuses, and chest, which
low the common cold, if suitable apparatus were
stalled in clinics and schools.

SOYA BEAN AGAIN

THE soya bean has been cultivated in China, Manchuria,
d Japan from time immemorial, and of late years has
come an important crop in the United States and in
nada, though rather for industrial than dietetic pur-
ses. In Europe it has been increasingly used for food,
pecially in war-time, and has acquired a position of
eem.

The composition of the soya bean is unique. Its protein
ntent (N × 6·25) is estimated as running from 33% to
%, whereas the pulses generally have but 20–23%:
leed no foods except cooked lean meat, or a hard cheese
ade from skimmed milk, come anywhere near it in
otein content. Another advantage is its high percentage
oil, with much unsaturated fatty acid in its triglycer-
es. No ordinary pulse contains much fat, though the
anut resembles the soya bean in this characteristic.
nally its carbohydrates are not starch but dextrins,
d there is more calcium and iron than in other pulses.
om all this the value of soya bean as a food seems
yond doubt, if the disadvantage of its bitter taste can
eliminated—as it can. At the least its high protein
ntent recommends its consumption when other protein
scarce; for even if the quality of the protein is low,
quantity may make up for this. Actually the earlier
alyses of the amino-acid content of glycinin (the chief
otein of soya bean) suggested that its quality is not
v. Osborne and Clapp[8] demonstrated the presence
leucine, tyrosine, arginine, lysine, and histidine in
r amount; Jones and Waterman[9] added tryptophan;
onka and Jones[10] raised the last workers' estimate
30%; and Barnes and Maack[11] showed that methi-
ine was present to 1·8%. Hence, though cystine and
ethionine are not well represented, soya protein has
l the essential amino-acids investigated up to date.

So much for the armchair arguments for the use of
ya bean as food—arguments which have led Henry
rd to cultivate it at Dagenham, and Hitler (they say)
give it to his storm troops. Unfortunately when we
rn to accurate experiment on animals and human
ings the case falls to the ground. Aykroyd and
ishnan,[12] well before the late war, showed that addition
soya bean to the diet of mission school-children
proved their growth-rate not a whit, whereas skim-
lk powder improved it remarkably. And now the
ole subject has been reinvestigated by a subcommittee
the Nutrition Advisory Committee of the Indian
search Fund Association.[13] Working with young and
ult rats and human beings, experiments were made
the biological values of soya bean and other pulses,
d the effect of soya bean and other supplements on the growth of rats and of children was tested in the Universities of Dacca and Lahore, the Seth G.S. Medical College, Bombay, and the Nutrition Research Laboratories, Coonoor. The results were concordant and led to the conclusion that "although soya bean contains more of fat, minerals, vitamins and 'available' proteins than other pulses, it has, for some unknown reason, not proved itself superior to other pulses within the range of experiments reported. . . . Taking the results obtained so far into consideration, the subcommittee is of the opinion that as a supplement to typical Indian diets based on cereals, but adequate in quantity, soya bean has no special advantages over common Indian pulses."

Of course, as the committee says, this is not the last word on the nutritive value of the soya bean; but it seems to be losing a little of its prestige.

Olsen, A. M. *Proc. Mayo Clin.* 1946, 21, 53.
Osborne, T. B., Clapp, S. H. *Amer. J. Physiol.* 1907, 19, 468.
Jones, D. B., Waterman, H. C. *J. biol. Chem.* 1921, 46, 459.
Czonka, F. A., Jones, D. B. *J. agri. Res.* 1933, 46, 51.
Barnes, R. H., Maack, J. F. Nutritive Value of Soybeans, Minneapolis, 1943.
Aykroyd, W. R., Krishnan, B. G. *Ind. J. med. Res.* 1937, 24, 1093.
Spec. rep. Indian Res. Fund Ass. no. 13, 1945.

A DIFFICULT DIAGNOSIS

IT has been said that serious disease is nowhere more liable to be overlooked than when it affects the pericardium.[1] Certainly tuberculous pericarditis, with its insidious onset and its confusing early symptoms, may easily escape diagnosis, and is probably more common than is generally believed.[2,3] The onset, unlike that of rheumatic pericarditis, is seldom associated with pain; the accumulation of fluid, being gradual, is well supported, and a very large effusion may form before attention is attracted by signs of mediastinal pressure; indeed as much as 2–3 litres has been aspirated. The fluid is more often blood-stained than serous, and it may be difficult to demonstrate tubercle bacilli either by culture or by guineapig inoculation. A further cause of difficulty is that the constitutional disturbances of active tuberculosis which attend the pericarditis itself may easily be attributed to the primary lesion in the lung, pleura, or spine, and diagnosis is then delayed until the development of cardiac tamponade. Sometimes, however, the condition arises in a patient (of any age) who has been in good health until a recent influenza-like illness; in these cases infection of the pericardium is attributed to direct lymphatic spread from reactivated tuberculous mediastinal or hilar glands; and prompt diagnosis is particularly important since the primary treatment is that of the underlying tuberculous focus.

If the patient survives, he develops the features characteristic of Pick's disease—enlarged liver, ascites, muffled heart-sounds, and small pulse-pressure—for which surgical treatment now offers the chance of dramatic cure. It may be that in future early recognition of tuberculous pericarditis and improved treatment will arrest the disease before this stage of constrictive pericarditis is reached. The induction of a pneumopericardium, already helpful in diagnosis, may also find a place in therapy. The value of local penicillin in acute coccal pericarditis is already established.[4] Is it too much to hope that antibiotics of the streptomycin group will provide the remedy for a condition which has hitherto resisted active medical treatment?

ACCORDING to present plans the House of Lords will consider the National Health Service Bill on Oct. 8 and 9, immediately after their return from the summer recess.

---

1. Hannesson, H. *Tubercle, Lond.* 1941, 22, 79.
2. White, P. D. Heart Disease, New York, 1944.
3. Ellman, P. *Brit. Heart J.* 1945, 7, 147.
4. Wise, A. W., Shafter, L. E. *J. Amer. med. Ass.* 1945, 127, 583.

CALCIUM CARBONATE IN NATIONAL FLOUR.—The Minister of Food announces that, on the advice of the special diets advisory committee of the Medical Research Council, from Aug. 11 the rate of addition of calcium carbonate (creta *præparata*) to national flour has been increased from 7 oz. to 14 oz. per sack of 280 lb. This, it is stated, is to compensate for the increased content of phytic acid in 90%-extraction flour.

Special Articles

NUTRITIONAL RETROBULBAR NEURITIS

NUTRITIONAL OPTIC NEUROPATHY

D. FITZGERALD MOORE
M.R.C.S., D.T.M. & H.
LATE SENIOR MEDICAL OFFICER, WEST AFRICAN MEDICAL (COLONIAL) SERVICE

RETROBULBAR neuritis has been one of the most common nutritional diseases affecting prisoners-of-war (P.O.W.) and internees in the Far East. The repatriation of these patients has provided material for further investigation in this country, where formerly it had not been observed. In this paper I compare the information more recently acquired with the results of earlier work, and draw some conclusions about the prevention of this and associated conditions in other parts of the world.

Before doing so, I wish to acknowledge the splendid morale of the prisoners and the extremely fine work done by the medical officers to limit malnutrition by planning the available rations so as to achieve the best qualitative results and by devising ingenious methods of obtaining or developing extra sources of supply. Without doubt many lives were saved, and a firm control was gained over a situation which must otherwise have proved catastrophic.

The conditions, however, were such that a high incidence of malnutrition could not be prevented. Supplies of such essentials as 'Marmite' and dried brewers' yeast—both preventive and curative of this ophthalmic condition in its early phases—could have been available only in very moderate amounts; and, though thiamine and nicotinic acid were apparently more plentiful and put to the fullest possible use, other synthetic vitamins were also limited.

It has been shown (Nutrition Society 1946, Williamson 946) that the P.O.W. were confined in two main areas—in Formosa and the northern area, and in Malaya. In both areas energy food values were fairly well maintained, but there were well-marked differences in the type and quality of the diets. In Formosa and the northern area the main source of carbohydrate was unpolished rice, or if the rice was polished it was often reinforced with barley in the earlier period of captivity. Soya bean was also supplied in fair amount. But in Malaya the rice was polished and of exceptionally poor quality, and it was not reinforced with natural foodstuffs. Also the protein was much more limited. In Formosa nutritional retrobulbar neuritis and keratitis (riboflavine deficiency), though common in the later period of captivity, was far less in evidence than in Malaya.

It has been generally accepted by those in charge that there was no real shortage of vitamins A and C, though there was a shortage of fats. But vitamin A was amply provided by the green leafy food, the extreme value of which was at once recognised, every possible means being taken to extend supplies. It has also been accepted that the outstanding vitamin deficiencies were those of the vitamin-B complex. The most instructive dietary tables, drawn up in the camps, demonstrate these facts in great detail.

Thiamine, though it could cure and prevent beriberi (in one camp, after the first initial outbreaks, beriberi was kept almost entirely in abeyance), could neither prevent nor cure retrobulbar neuritis. In general the results of treatment in nutritional retrobulbar neuritis were disappointing, but conditions were all against a successful issue.

If full use is to be made of this newer evidence, in the interests both of research and of nutrition, it is necessary to compare with these conditions which caused retrobulbar neuritis other known conditions which also have been shown to cause it, and the different circum stances in which it can arise, in the hope that som common factor or factors will emerge and point mo definitely to the cause. For these purposes it is necessar to present again some of the known facts.

SIGNS AND SYMPTOMS

"Dimness of vision" or "indistinctness of vision has been recognised for many years as associated eith with secondary pellagra (Calhoun 1918, Carroll 193 or with the common tropical syndrome now identifie (Sebrell and Butler 1938, Sydenstricker et al. 1939, Kru et al. 1940) as hyporiboflavinosis. Excluding earli Japanese knowledge, the first real recognition of th syndrome was made in 1911 by Stannus, who not onl described the general signs and symptoms but also dre attention to its association with pellagra. This, as a guid to subsequent investigation, seems to be a vital link.

In 1918 Scott described an acute condition whi he believed to be toxic and which he called "t central neuritis of Jamaica." This occurred amon coolies there whose diet consisted almost entirely sugarcane. Among the general signs and sympton were "itching of the eyes, congestion of the conjunctiv slight photophobia, indistinctness of vision, burnin sensations of the mouth, numbness and burning of th feet, and in some cases ataxia." Meagher (1936) ident fied a similar condition in the Solomon Islands. I Sierra Leone Wright (1928) described a condition whic was identical with that described by Stannus, and whic in 1930, in a privately printed report, he called the A an B avitaminosis of Sierra Leone. He was the first t introduce active treatment. In Nigeria I (Moore 193 reported on defective vision associated with the sam syndrome among school-children. I then viewed th visual condition as either a toxic amblyopia or a retr bulbar neuritis. Later (Moore 1932) the diagnosis retr bulbar neuritis was finally preferred and from that dat has been constantly used. Still later (Moore 193 the term "nutritional" was added on the suggestion McCarrison. There are, however, some points it is fe advisable to restate here. The fundus appearanc may vary greatly, though most commonly they are i keeping with a retrobulbar neuritis (partial optic atrophy But some cases, even of long duration, showed no chang at all, and in others a frank primary atrophy was sim lated, and more exceptionally optic neuritis. Dansey Browning (1946), Rich (1946), and Dansey-Brownin and Rich (1946) in their helpful and detailed clinic reports on released P.O.W. have made similar observa tions. To meet all considerations, a more gener term may be required, and "nutritional optic neur pathy" (as has been suggested) is a reasonable one.

Landor and Pallister (1935) recognised the syndrom in a Malay prison, and included "dimness of vision among the symptoms described. They found co liver oil useless. They were the first to use autoclave marmite in the more general condition.

Jimenez Garcia (1940), in Spain, investigated a simil syndrome among Europeans during the civil war 1936–39. He also described a retrobulbar neuritis. H believes the condition is a B_2-complex deficiency. This ver important work has been insufficiently recognised in th country. There were many cases not only of retrobulba neuritis but also of other effects of vitamin-B deficiency and results of therapeutic trials. A study of the condi tions in the siege of Madrid must bear valuable com parisons with the privations undergone in the Far East.

More recent contributions are those of Wilkinson an King (1944) in China, and of Dansey-Browning (1946) Rich (1946), Dansey-Browning and Rich (1946), Garlan (1946), Ridley (1945), Spillane (1945), Spillane an Scott (1945), and R. E. Wright (1946) in this countr on released P.O.W., besides the reports of the medica ers in charge of the P.O.W. and internee camps, to m special acknowledgment has already been made.

TREATMENT

n Nigeria, from 1931 onwards, treatment in the early ses of this condition was generally successful (see s. 1–3). The following is a typical example from many ers quoted in published work.

Nov. 13, 1937: an Ibo, aged 15 years, a thin depressed y, with skin grey and dry, severe perlèche dry scaly otum, raw red tongue, burning of the feet, and photo-obia. Mother says he was cheerful before onset Vision fective February, 1937, severely so by March In June was forced to leave school, as he could only "listen in ss" Mother a petty trader. Diet: manioc 4 "cups" ll daily, stockfish, red-palm oil, some green leaf, a small nount of meat occasionally, peppers, and salt Vision 1/60. nable to read print. Both disks, optic neuritis. Treat-ent: autoclaved marmite, one "cigarette tin" full weekly.

Nov. 26: mouth and perlèche entirely healed, scrotum etter. Vision 5/60 J.20 pt.

Dec. 12: 6/36 J.12 pt.

Dec 31: 6/12 J 8 pt. Skin shiny and bright, whole appear-nce altered, and patient delighted with progress

Feb. 11, 1938: 6/6 J.1 pt.

If, however, treatment was delayed over six months, r perhaps a year, irreversibility became more manifest nd increased with time. It appears to me that this factor has been the essential one which has counted so much among P.O.W. and not, as some would maintain, an irreversibility from the start of the illness.

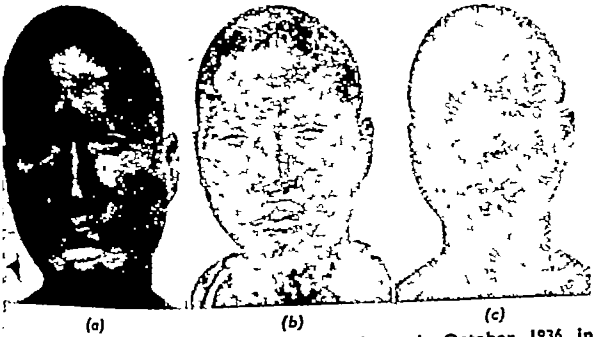

(a) (b) (c)

Fig. 1—"Joe," a Sierra Leonean, seen at Lagos in October, 1936, in conjunction with Dr. G. E. Dodds (now Senior Medical Officer, Nigeria): vision 5/60, 4/60, severe changes in optic nerves, and ataxia; history over two years; staple diet rice and manioc; (a) on first attendance; (b) after five days' treatment with marmite; (c) after eleven days' treatment. Visual condition was not followed up, as he was a member of a ship's crew in port only for that period.

With regard to prognosis, it was possible in Nigeria to follow up many cases for some years. Once the offending cause was removed, they did not worsen. This, it is felt, is of great importance so that patients may be reassured.

ÆTIOLOGY

The ætiology of nutritional retrobulbar neuritis in relationship to the more classical syndromes is still far from complete. I am satisfied, however, that it can be excluded from beriberi, though it can be associated therewith. The response I obtained with autoclaved yeast on the visual condition made this clear (Moore 1939). The investigations with thiamine in the P.O.W. camps surely brings further and impressive evidence against beriberi. In West Africa nearly all cases were either accompanied or preceded by hyporiboflavinosis (see also Hughes 1946). But it would not be safe to state that riboflavine deficiency caused the neural condition, for trials with riboflavine have never been sufficiently extended. Such tests are much more tedious and exacting in interpreting these findings than those directed to the more obvious skin and mouth conditions. Lack of riboflavine is no doubt an important causal factor, but other vitamins of the B complex, excluding thiamine, may also share in the cause, a view that has also been expressed by Stannus. The same is partly true for nicotinic acid, though there is more evidence that lack of this vitamin is not directly concerned. Experiences in P.O.W. camps appear also to support this view.

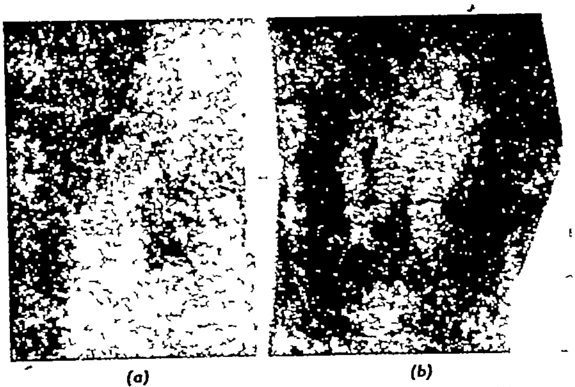

(a) (b)

Fig. 2—Same case as fig. 1: rashes on flexor aspects of (a) arm, and (b) leg, on first attendance.

Therapeutic investigation, therefore, by exclusion trials has reached a definite but only intermediate stage. Treatment has yielded important results, provided it is begun early, the dosage (marmite or brewers' yeast) is high, and it is maintained over a long period.

Clinical survey is important, for there are distinct variations and superimposed conditions to be found. Keratitis was rare in Nigeria, but common in Sierra Leone and apparently in P.O.W. camps. The Jamaican cases were fulminating. Beriberi is rare in Nigeria but common among ships' crews, on a diet of rice and salt fish, from Sierra Leone and Liberia.

A study of the various diets is a great assistance to the clinical diagnosis. In Nigeria retrobulbar neuritis was extremely common but in certain areas only, or under bad conditions which existed in some schools, chiefly boarding-schools, before the war. It was not seen in Nigeria or in those areas where yams or sweet potatoes or better-class cereals formed the staple carbohydrate. As early as 1933 I became convinced that manioc was the food cause, for the disease was essentially confined to the manioc-eaters. This view has been strongly upheld by Clark (1932, 1936), with the cyanogenetic theory, and his work might still be followed with advantage.

But in Jamaica manioc was replaced by sugarcane, in Sierra Leone and Spain (civil-war conditions) largely by rice, and in China and the Far East by rice. Where the rice was unpolished, or, as in P.O.W. camps, reinforced with barley and soya bean, there was least evidence of retrobulbar neuritis. A theory based on an exogenous toxin, therefore, can only be upheld if it can be proved to be common to all conditions. The theory of "spoiled rice" seems then to rest on rather slender grounds. There is an obvious alternative explanation—a theory based on an endogenous breakdown, as has been supported by Stannus (1940). It may be that certain foodstuffs do

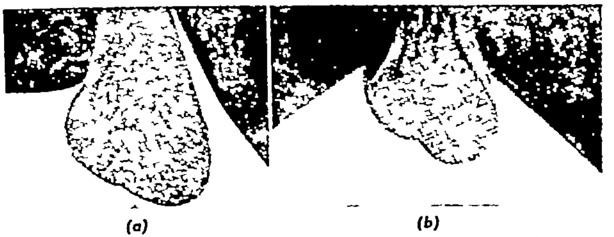

(a) (b)

Fig. 3—Same case as fig. 1: condition of scrotum and thighs (a) on first attendance, (b) after eleven days' treatment.

Special Articles

NUTRITIONAL RETROBULBAR NEURITIS

NUTRITIONAL OPTIC NEUROPATHY

D. FITZGERALD MOORE
M.R.C.S., D.T.M. & H.
LATE SENIOR MEDICAL OFFICER, WEST AFRICAN MEDICAL (COLONIAL) SERVICE

RETROBULBAR neuritis has been one of the most common nutritional diseases affecting prisoners-of-war (P.O.W.) and internees in the Far East. The repatriation of these patients has provided material for further investigation in this country, where formerly it had not been observed. In this paper I compare the information more recently acquired with the results of earlier work, and draw some conclusions about the prevention of this and associated conditions in other parts of the world.

Before doing so, I wish to acknowledge the splendid morale of the prisoners and the extremely fine work done by the medical officers to limit malnutrition by planning the available rations so as to achieve the best qualitative results and by devising ingenious methods of obtaining or developing extra sources of supply. Without doubt many lives were saved, and a firm control was gained over a situation which must otherwise have proved catastrophic.

The conditions, however, were such that a high incidence of malnutrition could not be prevented. Supplies of such essentials as 'Marmite' and dried brewers' yeast—both preventive and curative of this ophthalmic condition in its early phases—could have been available only in very moderate amounts; and, though thiamine and nicotinic acid were apparently more plentiful and put to the fullest possible use, other synthetic vitamins were also limited.

It has been shown (Nutrition Society 1946, Williamson 1946) that the P.O.W. were confined in two main areas—in Formosa and the northern area, and in Malaya. In both areas energy food values were fairly well maintained, but there were well-marked differences in the type and quality of the diets. In Formosa and the northern area the main source of carbohydrate was unpolished rice, or if the rice was polished it was often reinforced with barley in the earlier period of captivity. Soya bean was also supplied in fair amount. But in Malaya the rice was polished and of exceptionally poor quality, and it was not reinforced with natural foodstuffs. Also the protein was much more limited. In Formosa nutritional retrobulbar neuritis and keratitis (riboflavine deficiency), though common in the later period of captivity, was far less in evidence than in Malaya.

It has been generally accepted by those in charge that there was no real shortage of vitamins A and C, though there was a shortage of fats. But vitamin A was amply provided by the green leafy food, the extreme value of which was at once recognised, every possible means being taken to extend supplies. It has also been accepted that the outstanding vitamin deficiencies were those of the vitamin-B complex. The most instructive dietary tables, drawn up in the camps, demonstrate these facts in great detail.

Thiamine, though it could cure and prevent beriberi (in one camp, after the first initial outbreaks, beriberi was kept almost entirely in abeyance), could neither prevent nor cure retrobulbar neuritis. In general the results of treatment in nutritional retrobulbar neuritis were disappointing, but conditions were all against a successful issue.

If full use is to be made of this newer evidence, in the interests both of research and of nutrition, it is necessary to compare with these conditions which caused retrobulbar neuritis other known conditions which also have been shown to cause it, and the different stances in which it can arise, in the hope that common factor or factors will emerge and point definitely to the cause. For these purposes it is necessar to present again some of the known facts.

SIGNS AND SYMPTOMS

"Dimness of vision" or "indistinctness of vision" has been recognised for many years as associated eithe with secondary pellagra (Calhoun 1918, Carroll 193 or with the common tropical syndrome now identifie (Sebrell and Butler 1938, Sydenstricker et al. 1939, Kru et al. 1940) as hyporiboflavinosis. Excluding earlie Japanese knowledge, the first real recognition of thi syndrome was made in 1911 by Stannus, who not onl described the general signs and symptoms but also dre attention to its association with pellagra. This, as a gui to subsequent investigation, seems to be a vital link.

In 1918 Scott described an acute condition whic he believed to be toxic and which he called "& central neuritis of Jamaica." This occurred amo coolies there whose diet consisted almost entirely o sugarcane. Among the general signs and symptom were "itching of the eyes, congestion of the conjunctiv slight photophobia, indistinctness of vision, burnin sensations of the mouth, numbness and burning of th feet, and in some cases ataxia." Meagher (1930) identified a similar condition in the Solomon Islands. I Sierra Leone Wright (1928) described a condition whic was identical with that described by Stannus, and whic in 1930, in a privately printed report, he called the A an B avitaminosis of Sierra Leone. He was the first t introduce active treatment. In Nigeria I (Moore 1930 reported on defective vision associated with the sam syndrome among school-children. I then viewed th visual condition as either a toxic amblyopia or a retrobulbar neuritis. Later (Moore 1932) the diagnosis retrobulbar neuritis was finally preferred and from that dat has been constantly used. Still later (Moore 1937 the term "nutritional" was added on the suggestion o McCarrison. There are, however, some points it is fel advisable to restate here. The fundus appearance may vary greatly, though most commonly they are i keeping with a retrobulbar neuritis (partial optic atrophy) But some cases, even of long duration, showed no chang at all, and in others a frank primary atrophy was simulated, and more exceptionally optic neuritis. Dansey-Browning (1946), Rich (1946), and Dansey-Brownin and Rich (1946) in their helpful and detailed clinica reports on released P.O.W. have made similar observations. To meet all considerations, a more genera term may be required, and "nutritional optic neuropathy" (as has been suggested) is a reasonable one.

Landor and Pallister (1935) recognised the syndrom in a Malay prison, and included "dimness of vision" among the symptoms described. They found cod liver oil useless. They were the first to use autoclave marmite in the more general condition.

Jimenez Garcia (1940), in Spain, investigated a simila syndrome among Europeans during the civil war o 1936–39. He also described a retrobulbar neuritis. H believes the condition is a B_2-complex deficiency. This ver important work has been insufficiently recognised in thi country. There were many cases not only of retrobulba neuritis but also of other effects of vitamin-B deficiency and results of therapeutic trials. A study of the conditions in the siege of Madrid must bear valuable comparisons with the privations undergone in the Far East.

More recent contributions are those of Wilkinson and King (1944) in China, and of Dansey-Browning (1946), Rich (1946), Dansey-Browning and Rich (1946), Garland (1946), Ridley (1945), Spillane (1945), Spillane and Scott (1945), and R. E. Wright (1946) in this country on released P.O.W., besides the reports of the medical

Special Articles

NUTRITIONAL RETROBULBAR NEURITIS

NUTRITIONAL OPTIC NEUROPATHY

D. FITZGERALD MOORE
M.R.C.S., D.T.M. & H.
LATE SENIOR MEDICAL OFFICER, WEST AFRICAN MEDICAL (COLONIAL) SERVICE

RETROBULBAR neuritis has been one of the most common nutritional diseases affecting prisoners-of-war (P.O.W.) and internees in the Far East. The repatriation of these patients has provided material for further investigation in this country, where formerly it had not been observed. In this paper I compare the information more recently acquired with the results of earlier work, and draw some conclusions about the prevention of this and associated conditions in other parts of the world.

Before doing so, I wish to acknowledge the splendid morale of the prisoners and the extremely fine work done by the medical officers to limit malnutrition by planning the available rations so as to achieve the best qualitative results and by devising ingenious methods of obtaining or developing extra sources of supply. Without doubt many lives were saved, and a firm control was gained over a situation which must otherwise have proved catastrophic.

The conditions, however, were such that a high incidence of malnutrition could not be prevented. Supplies of such essentials as 'Marmite' and dried brewers' yeast—both preventive and curative of this ophthalmic condition in its early phases—could have been available only in very moderate amounts; and, though thiamine and nicotinic acid were apparently more plentiful and put to the fullest possible use, other synthetic vitamins were also limited.

It has been shown (Nutrition Society 1946, Williamson 1946) that the P.O.W. were confined in two main areas—in Formosa and the northern area, and in Malaya. In both areas energy food values were fairly well maintained, but there were well-marked differences in the type and quality of the diets. In Formosa and the northern area the main source of carbohydrate was unpolished rice, or if the rice was polished it was often reinforced with barley in the earlier period of captivity. Soya bean was also supplied in fair amount. But in Malaya the rice was polished and of exceptionally poor quality, and it was not reinforced with natural foodstuffs. Also the protein was much more limited. In Formosa nutritional retrobulbar neuritis and keratitis (riboflavine deficiency), though common in the later period of captivity, was far less in evidence than in Malaya.

It has been generally accepted by those in charge that there was no real shortage of vitamins A and C, though there was a shortage of fats. But vitamin A was amply provided by the green leafy food, the extreme value of which was at once recognised, every possible means being taken to extend supplies. It has also been accepted that the outstanding vitamin deficiencies were those of the vitamin-B complex. The most instructive dietary tables, drawn up in the camps, demonstrate these facts in great detail.

Thiamine, though it could cure and prevent beriberi (in one camp, after the first initial outbreaks, beriberi was kept almost entirely in abeyance), could neither prevent nor cure retrobulbar neuritis. In general the results of treatment in nutritional retrobulbar neuritis were disappointing, but conditions were all against a successful issue.

If full use is to be made of this newer evidence, in the interests both of research and of nutrition, it is necessary to compare with these conditions which caused retrobulbar neuritis other known conditions which also have been shown to cause it, and the different circumstances in which it can arise, in the hope that some common factor or factors will emerge and point more definitely to the cause. For these purposes it is necessary to present again some of the known facts.

SIGNS AND SYMPTOMS

"Dimness of vision" or "indistinctness of vision" has been recognised for many years as associated either with secondary pellagra (Calhoun 1918, Carroll 1936) or with the common tropical syndrome now identified (Sebrell and Butler 1938, Sydenstricker et al. 1939, Kruse et al. 1940) as hyporiboflavinosis. Excluding earlier Japanese knowledge, the first real recognition of this syndrome was made in 1911 by Stannus, who not only described the general signs and symptoms but also drew attention to its association with pellagra. This, as a guide to subsequent investigation, seems to be a vital link.

In 1918 Scott described an acute condition which he believed to be toxic and which he called "the central neuritis of Jamaica." This occurred among coolies there whose diet consisted almost entirely of sugarcane. Among the general signs and symptoms were "itching of the eyes, congestion of the conjunctiva, slight photophobia, indistinctness of vision, burning sensations of the mouth, numbness and burning of the feet, and in some cases ataxia." Meagher (1936) identified a similar condition in the Solomon Islands. In Sierra Leone Wright (1928) described a condition which was identical with that described by Stannus, and which in 1930, in a privately printed report, he called the A and B avitaminosis of Sierra Leone. He was the first to introduce active treatment. In Nigeria I (Moore 1930) reported on defective vision associated with the same syndrome among school-children. I then viewed the visual condition as either a toxic amblyopia or a retrobulbar neuritis. Later (Moore 1932) the diagnosis retrobulbar neuritis was finally preferred and from that date has been constantly used. Still later (Moore 1937) the term "nutritional" was added on the suggestion of McCarrison. There are, however, some points it is felt advisable to restate here. The fundus appearances may vary greatly, though most commonly they are in keeping with a retrobulbar neuritis (partial optic atrophy). But some cases, even of long duration, showed no change at all, and in others a frank primary atrophy was simulated, and more exceptionally optic neuritis. Dansey-Browning (1946), Rich (1946), and Dansey-Browning and Rich (1946) in their helpful and detailed clinical reports on released P.O.W. have made similar observations. To meet all considerations, a more general term may be required, and "nutritional optic neuropathy" (as has been suggested) is a reasonable one.

Landor and Pallister (1935) recognised the syndrome in a Malay prison, and included "dimness of vision" among the symptoms described. They found cod-liver oil useless. They were the first to use autoclaved marmite in the more general condition.

Jimenez Garcia (1940), in Spain, investigated a similar syndrome among Europeans during the civil war of 1936–39. He also described a retrobulbar neuritis. He believes the condition is a B_2-complex deficiency. This very important work has been insufficiently recognised in this country. There were many cases not only of retrobulbar neuritis but also of other effects of vitamin-B deficiency, and results of therapeutic trials. A study of the conditions in the siege of Madrid must bear valuable comparisons with the privations undergone in the Far East.

More recent contributions are those of Wilkinson and King (1944) in China, and of Dansey-Browning (1946), Rich (1946), Dansey-Browning and Rich (1946), Garland (1946), Ridley (1945), Spillane (1945), Spillane and Scott (1945), and R. E. Wright (1946) in this country on released P.O.W., besides the reports of the medical officers in charge of the P.O.W. and internee camps, to whom special acknowledgment has already been made.

TREATMENT

In Nigeria, from 1931 onwards, treatment in the early phases of this condition was generally successful (see figs. 1–3). The following is a typical example from many others quoted in published work.

Nov 13, 1937: an Ibo, aged 15 years, a thin depressed boy, with skin grey and dry, severe perlèche, dry scaly scrotum, raw red tongue, burning of the feet, and photophobia. Mother says he was cheerful before onset Vision defective February, 1937, severely so by March. In June he was forced to leave school, as he could only "listen in class" Mother a petty trader Diet· manioc 4 "cups" full daily, stockfish, red-palm oil, some green leaf, a small amount of meat occasionally, peppers, and salt Vision 1/60. Unable to read print. Both disks, optic neuritis. Treatment autoclaved marmite, one "cigarette tin" full weekly.

Nov 26: mouth and perlèche entirely healed, scrotum better. Vision 5/60 J.20 pt.

Dec. 12: 6/36 J 12 pt.

Dec 31: 6/12 J 8 pt. Skin shiny and bright, whole appearance altered, and patient delighted with progress.

Feb. 11, 1938: 6/6 J.1 pt.

If, however, treatment was delayed over six months, or perhaps a year, irreversibility became more manifest and increased with time. It appears to me that this factor has been the essential one which has counted so much among P.O.W. and not, as some would maintain, an irreversibility from the start of the illness.

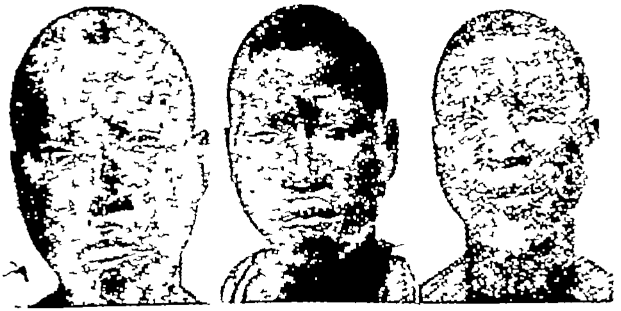

(a) (b) (c)

Fig. 1—"Joe," a Sierra Leonean, seen at Lagos in October, 1936, in conjunction with Dr. G. E. Dodds (now Senior Medical Officer, Nigeria): vision 5/60, 4/60, severe changes in optic nerves, and ataxia; history over two years; staple diet rice and manioc; (a) on first attendance; (b) after five days' treatment with marmite; (c) after eleven days' treatment. Visual condition was not followed up, as he was a member of a ship's crew in port only for that period.

With regard to prognosis, it was possible in Nigeria to follow up many cases for some years. Once the offending cause was removed, they did not worsen. This, it is felt, is of great importance so that patients may be reassured.

ÆTIOLOGY

The ætiology of nutritional retrobulbar neuritis in relationship to the more classical syndromes is still far from complete. I am satisfied, however, that it can be excluded from beriberi, though it can be associated therewith. The response I obtained with autoclaved yeast on the visual condition made this clear (Moore 1939). The investigations with thiamine in the P.O.W. camps surely brings further and impressive evidence against beriberi. In West Africa nearly all cases were either accompanied or preceded by hyporiboflavinosis (see also Hughes 1946). But it would not be safe to state that riboflavine deficiency caused the neural condition, for trials with riboflavine have never been sufficiently extended. Such tests are much more tedious and exacting in interpreting these findings than those directed to the more obvious skin and mouth conditions. Lack of riboflavine is no doubt an important causal factor, but other vitamins of the B complex, excluding thiamine, may also share in the cause, a view that has also been expressed by Stannus. The same is partly true for nicotinic acid, though there is more evidence that lack of this vitamin is not directly concerned. Experiences in P.O.W. camps appear also to support this view.

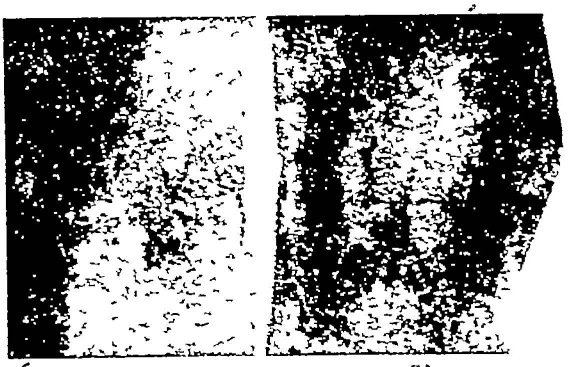

(a) (b)

Fig. 2—Same case as fig. 1: rashes on flexor aspects of (a) arm, and (b) leg, on first attendance.

Therapeutic investigation, therefore, by exclusion trials has reached a definite but only intermediate stage. Treatment has yielded important results, provided it is begun early, the dosage (marmite or brewers' yeast) is high, and it is maintained over a long period.

Clinical survey is important, for there are distinct variations and superimposed conditions to be found. Keratitis was rare in Nigeria, but common in Sierra Leone and apparently in P.O.W. camps. The Jamaican cases were fulminating. Beriberi is rare in Nigeria but common among ships' crews, on a diet of rice and salt fish, from Sierra Leone and Liberia.

A study of the various diets is a great assistance to the clinical diagnosis. In Nigeria retrobulbar neuritis was extremely common but in certain areas only, or under bad conditions which existed in some schools, chiefly boarding-schools, before the war. It was not seen in Nigeria or in those areas where yams or sweet potatoes or better-class cereals formed the staple carbohydrate. As early as 1933 I became convinced that manioc was the food cause, for the disease was essentially confined to the manioc-eaters. This view has been strongly upheld by Clark (1932, 1936), with the cyanogenetic theory, and his work might still be followed with advantage.

But in Jamaica manioc was replaced by sugarcane, in Sierra Leone and Spain (civil-war conditions) largely by rice, and in China and the Far East by rice. Where the rice was unpolished, or, as in P.O.W. camps, reinforced with barley and soya bean, there was least evidence of retrobulbar neuritis A theory based on an exogenous toxin, therefore, can only be upheld if it can be proved to be common to all conditions. The theory of "spoiled rice" seems then to rest on rather slender grounds. There is an obvious alternative explanation—a theory based on an endogenous breakdown, as has been supported by Stannus (1940). It may be that certain foodstuffs do

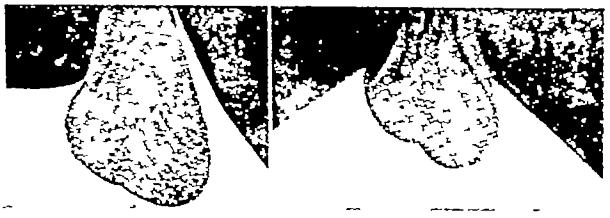

(a) (b)

Fig 3—Same case as fig. 1: condition of scrotum and thighs (a) on first attendance, (b) after eleven days' treatment.

possess inhibitory toxic factors and also help to accelerate metabolic breakdown (e.g., cyanogenetic factors ; alcohol in secondary pellagra).

What has been established is that under conditions of duress or environmental restrictions, leading to an insufficiency in normal intake of protein and, to satisfy hunger, a relative overconsumption of energy foodstuffs poor not merely in vitamin B_1 but in all the B vitamins, nutritional retrobulbar neuritis has become common. Other syndromes may of course coexist, such as beriberi. And why say that rice can cause only beriberi, since in the light of our newer knowledge of the biochemistry of foodstuffs it is poor in all nutrients? (Moore 1942.)

It seems, then, that further and more exhaustive inquiries into the various diets on the lines of those which have already clarified some issues would be rich in results. The dietary records kept in the Far East will undoubtedly prove of extreme value.

PROPHYLAXIS

How do these conclusions affect the question of prevention? The fact that Europeans in the siege of Madrid and in the Far East have suffered from a nutritional eye defect has aroused world-wide interest, and rightly so ; but this is only one aspect of the picture.

It is known that, both in war and in peace, very many coloured people must be affected by one or other of these conditions. The world is now faced with acute famine, and naturally all that is possible is being done to meet this crisis. But it is certain that, where there is a gross dietary imbalance, and where carbohydrate foods of the type indicated above are almost the sole source of energy, and protein is deficient, then we can be certain that this visual complaint and the associated primary deficiency states must remain. It is not enough to ensure an adequate crop of rice or manioc ; we must also aim at a vast improvement in the variety of carbohydrate foods and of the diet as a whole and a rise in the economic standards of life. It has been ably argued that food yeast may prove a partial salvation. I believe that this must be only a temporary expedient. Perhaps these further experiences and the knowledge gained from them will do more than extend research by drawing attention to a condition or conditions which in time of peace ought to be completely or at least largely avoided.

ADDENDUM

Any survey of earlier work would be necessarily incomplete without reference to the following, recorded in Leitch's *Dietetics in Warm Climates :* " Winterbottom (1796), Physician to the Colony of Sierra Leone, drew attention to the observation by Bontius that among Javanese and Malays weakness of sight, said to be caused by rice, is removed by a better diet." Also to " Robert Clarke (1841), Surgeon to the Colony of Sierra Leone, who described ' ophthalmia and paralytic complaints with chronic inflammation of the mouth ' in the prison, and the diet was said to be ' one quart of rice and a quarter of a gill of salt per day.' "

Also the account referred to by H. H. Scott (1918) of H. H. Strachan (1888, 1897) (who, though he believed the cause malarial, gave a most observant account of his visual findings and the sore-mouth syndrome).

REFERENCES

Calhoun, F. P. (1918) *Amer. J. Ophthal.* 1, 834.
Carroll, F. D. (1936) *Arch. Ophthal.* 16, 919.
Clark, A. (1932) *Trans. R. Soc. trop. Med. Hyg.* 26, 301.
— (1936) *J. trop. Med. (Hyg.)* 39, 269.
Dansey-Browning, G. C. (1946) *Brit. med. J.* i, 288.
— Rich, W. M. (1946) *Ibid*, p. 20.
Garcia, J. (1940) see *Trop. Dis. Bull.* 38, 401.
Garland, H. G. (1946) *Brit. med. J.* i, 143.
Hughes, W. (1946) *Lancet*, i, 569.
Kruse, H. D., Sydenstricker, V. P., Sebrell, W. H., Cleckley, H. M. (1940) *Publ. Hlth Rep., Wash.* 55, 157.
Landor, J. V., Pallister, R. A. (1935) *Trans. R. Soc. trop. Med. Hyg.* 29, 121.
Meagher, J. L. (1936) *Ibid*, 30, 251.

Continued at foot of next column

MEDICAL EDUCATION IN QUEENSLAND

FROM OUR AUSTRALIAN CORRESPONDENT

A REVIEW of medical training at the University of Queensland has resulted in a new curriculum which will come into operation in 1947. The course will last six years, the academic part occupying five years, and the final year being spent in attendance or residence at an approved hospital. The final examinations will be held at the end of the sixth year.

The objectives of the curriculum are :

In the practice of general medicine and surgery *specialism should be carefully avoided.*

Development of intelligence, initiative, and judgment.—It is an anachronism for a student on graduation to rely on such facts as he has managed to memorise, without having the ability to think and act for himself. Scientific direction must replace empiricism.

Training in acceptance of professional responsibilities.—Graduates must have the faculty of judgment developed by their medical training.

Training in moral responsibility.—The spirit of the Hippocratic oath is much more necessary today than it was in the mystic era which saw its birth.

A balanced education.—Equilibrium must be achieved in the face of clamour for the good practical man on the one hand, and a lament for the passing of the classical education on the other. The changing nature of this equilibrium should be recognised, and changes made gradually.

Promotion of student health.—The practitioner of medicine must be an apostle of health, and positive health practices would have an educational as well as a physical value.

Training in citizenship.—The relationship between the practitioner and the community is an essential aspect of medical practice.

A teacher, as well as having a sound knowledge, should be able to inspire the student with a love of learning in general and of his own subject in particular; he should have a positive character, high in moral principles ; he should have, or should develop, the art of teaching ; and he should be critical of himself and have a balanced outlook. The teacher's main responsibilities should be :

To make facts available in convenient form.—By appropriate stages, education in the true sense must be substituted for teaching in the narrow sense.

To train students in judgment upon facts.—Facts are mainly valuable for the enrichment of concept. The battle-training of judgment should replace much of the squad drill of facts.

To train students in the application of theory to practice.—Practical demonstration is preferable to didactic instruction.

To train students in manual skill.—Delight in performance is a necessary attitude of mind prerequisite to the development of manual skill.

To encourage the development of character and a wide education.

To correlate subjects with one another.—Each subject must be linked with what went before, what is coming after, and what is being taught at the same time.

For the matriculation, English, physics, chemistry, mathematics, and one language are essential. In the first year much of the general physics and chemistry will b

References continued

Moore, D. G. F. (1930) *W. Afr. med. J.* 3, 46.
— (1932) *Ibid*, 6, 28.
— (1937) *Lancet*, i, 1225.
— (1939) *J. trop. Med. Hyg.* 13, 109.
— (1942) *Ibid*, 45, 129.
Nutrition Society (1946) see *Lancet*, June 8, p. 852.
Rich, W. M. (1946) *Brit. med. J.* i, 330.
Ridley, H. (1945) *Brit. J. Ophthal.* 29, 613.
Scott, H. H. (1918) *Ann. trop. Med. Parasit.* 12, 109.
Sebrell, W. H., Butler, R. E. (1938) *Publ. Hlth Rep., Wash.* 53, 2282.
Spillane, J. D. (1945) *Lancet*, ii, 317.
— Scott, G. I. (1945) *Ibid*, p. 261.
Stannus, H. S. (1911) *Trans. R. Soc. trop. Med. Hyg.* 5, 112.
— (1940) *Lancet*, i, 351.
— (1944) *Brit. med. J.* ii, 103 and 140.
Sydenstricker, V. P., Geeslin, L. E., Templeton, C. M., Weaver, J. W. (1939) *J. Amer. med. Ass.* 113, 1697.
Wilkinson, P. B., King, A. (1944) *Lancet*, i, 528.
Williamson, A. D. (1946) *Brit. med. J.* i, 545.
Wright, E. J. (1928) *W. Afr. med. J.* 2, 127.
— (1930) The A and B Avitaminosis of Sierra Leone (privately printed).
Wright, R. E. (1946) *Brit. med. J.* i, 546.

omitted. Physics will be restricted to a revision and unification of the matriculation standard and the study of the physical phenomena important to the understanding, investigation, and control of living material. Chemistry similarly will be revised and unified up to matriculation standard, and will provide the fundamentals of physical and organic chemistry necessary for the understanding of physiology. The first year will include general biology, comparative anatomy, general human anatomy, developmental anatomy and histology, and medical zoology. The second year will cover regional, systematic, and developmental anatomy, systematic physiology, integrative physiology, and neurology. The third year will deal with clinical anatomy and physiology, general and special pathology, pharmacology, normal psychology, clinical methods, materia medica and pharmacy, bacteriology, and hæmatology. The fourth year will cover systematic medicine and surgery, social medicine, and obstetrics. In the fifth year the students will work in clinical groups, and will also study and practise clinical anatomy and pathology, surgical pathology, and social medicine. The special subjects will be allotted only two hours per week. Two weeks' full time must be spent in residence at an obstetric hospital. In the sixth year ten weeks' residence will be undertaken in (i) a surgical and (ii) a medical division of a general hospital; (iii) a women's hospital; and (iv) a children's hospital.

Students should be initially selected on the grounds of character and physical standard as well as by examination. During the course, a third of the marks should be allotted for work done during the year as shown by practical work, seminars, and quiz classes. Greater importance should be attached to knowledge of principles and their application than to memorised facts. Manual ability should be considered in the assessment of qualification.

In the preparation of this curriculum much valuable guidance was derived from the report of the Royal College of Physicians of London. The Goodenough report, which appeared after the curriculum was formulated, was a helpful reinforcement in securing administrative approval.

RESEARCH ON AGEING

CONFERENCE IN LONDON

ON July 16 a conference was held in London by the British branch of the Club for Research on Ageing. The meeting was attended by delegates of the European branches and by other guests interested in the subject. Lord Nuffield was elected hon. president of the conference, and Sir Francis Fraser chairman.

Sir **FRANCIS FRASER** described the rôle of clinical research on old age. This, he said, was the most difficult of all fields of research, since there were always so many uncontrolled factors. Quick results were not to be expected: one must think in terms of long-continued and laborious research. Pathological conditions were generally present in addition to old age, and it was difficult to differentiate between them. He concluded that clinical research on physiological ageing was practically impossible, and it was better for clinicians to concentrate on studying primarily the pathological conditions.

SCOPE OF THE PROBLEM

Prof. F. A. E. **CREW**, F.R.S., gave an account of recent work in Scotland on the sociological problems of an ageing population. The current figures for births, deaths, and marriages appeared satisfactory on the surface, but when examined more carefully the present population trend showed a most disquieting increase in the proportion over 65 years of age. Since industrial capacity diminished after 35 there was a danger of the old becoming a burden on the younger members of the community. He emphasised the need for closer collaboration between clinical investigators and those working on population research. The real problem of gerontology was "not how to give years to life, but life to years."

Dr. **MACDONALD CRITCHLEY** called for further research on the nervous system in normal ageing as well as the associated pathological conditions; he described a number of possible schemes of research in neurogerontology.

Dr. V. **KORENCHEVSKY** defined the aim of gerontology as not merely to achieve a longer life but also a stronger one. Since ageing starts at a very early age, the whole life-span, and even the development of the fœtus, must be studied. Attempts at rejuvenation by such methods as Voronoff's glandular grafts, hormones, or Bogomoletz's serum had proved unsatisfactory, since they achieved only temporary stimulation; the aim must be to discover and remove the causes of premature ageing and not to stimulate degenerated tissues. He outlined five conditions required for international and local organisation of research on ageing.

Prof. F. C. **BARTLETT**, F.R.S., considered that the effects of ageing on performance could be compared with the effects of other factors, such as extremes of heat, humidity, and noise. Each of these factors produced an increased liability to fatigue, which could be measured in a number of ways. New methods developed during the war for the study of skill and fatigue in air pilots might be applicable.

Prof. G. R. **CAMERON**, F.R.S., emphasised the need for quantitative research on the effects of ageing on the blood-vessels of the brain: there was scope for the employment of many new techniques. Lord **NUFFIELD** said he could not understand how ageing could begin in early childhood, since the athletic performance of a child went on improving up to the age of 15. Dr. **KORENCHEVSKY** and Mr. **JOHN HAMMOND**, F.R.S., pointed out that different organs developed at different ages: brain and bone had priority at an early age and muscle developed only later. Prof. M. J. **STEWART** wanted research to be carried out on blood changes in old age; it was striking that many old people died of pneumonia because their blood failed to respond as vigorously as that of young people to the toxins of the pneumococcus.

IMPORTANCE OF STATISTICS

Dr. **DEREK RICHTER** urged the need for more accurate statistics on causes of death. The present figures were unreliable as permission for a necropsy was often refused. The public must be educated to realise the importance and value of post-mortem examinations. The development of gerontology as a science could be seen in the two editions of Cowdry's book on ageing. The first edition was made up largely of speculation and poetry; the second contained less poetry and more facts, figures, tables, and measurements. Clinical science could help by providing greater precision in the measurement of the factors concerned.

Dr. **LETITIA FAIRFIELD** deplored the way in which the chronic sick and aged were despised by the teaching hospitals and thrust on the public authorities. Medical science had relieved many of the worst miseries of old age, such as bladder and prostate troubles; but senile dementia was a social problem of increasing urgency. Was it right that healthy young women, who should be bringing up children in their own homes, were now engaged in washing dirty linen in wards filled with wet and dirty senile dements?

The guests from Sweden, Denmark, Holland, and France reviewed the work on ageing that was in progress in their respective countries. Dr. W. B. **PURCHASE**, speaking as a coroner, agreed that the present statistics were unreliable, and said he could provide each year reliable figures for some two thousand cases on which necropsies were carried out. Professor **CREW** said he was anxious to close with Dr. Purchase's offer. Dr. **FAIRFIELD** considered that the conspiracy among general practitioners to avoid putting cancer on death certificates might be sufficient to result in a significant statistical error.

The morning session was concluded by the passing of five resolutions, proposed by Dr. **KORENCHEVSKY**, expressing the views of the conference on the requirements for the rapid advance of gerontology. These included international coöperation, for which purpose the club was founded; establishment of permanent institutes for research on ageing; and the provision of ample funds to secure these facilities.

SEX HORMONES AND AGEING

At the afternoon session Mr. P. Williams, d.sc., read a paper for Prof. E. C. Dodds, f.r.s., on the significance of androgen and œstrogen excretion in the urine in relation to ageing. The tendency to cancer of the prostate was considerably affected by the sex-hormone balance as shown by experiments on castration and by the effects of administering stilbœstrol in the male. There was a need for further quantitative data on all age-groups.

Professor Crew pointed out that the male infant had a much poorer chance of survival than the female. A male infant with bronchopneumonia was thus suffering from two conditions: (1) bronchopneumonia and (2) maleness. Could we use sex-hormone preparations to transform temporarily a male infant into a female to get over this disadvantage?

Mr. Hammond described recent work at Cambridge on the ageing of the fœtus in rabbits and sheep. The chronological age must be differentiated from the physiological age, as measured by the size, the ossification of the bones, and development of the heat-regulating centres. The physiological ageing of the fœtus could be varied experimentally by controlling the size of the litter and the nutrition of the mother. He suggested that similar factors might operate in the return to an infantile condition in old age.

Prof. J. B. Duguid put forward a new theory of the thickening of arteries in atherosclerosis. He felt that we had been misled by the teachings of Virchow. The thickening did not come from within the artery walls; it was due to the organisation of successive layers of fibrin deposited on the intima. The difference was fundamental, since the primary cause of the disease was in the blood rather than in the vessels. Professor Cameron asked how this concept could account for lipoids in atheromatous plaques. If the arterial narrowing was due to encrustation with fibrin from without, why did not the veins get narrowed in the same way? Professor Duguid felt the relation of lipoid changes to atheroma was not fully understood. The veins did not get narrowed because, when they were thrombosed, the whole vein became blocked, whereas in an artery the vessel was cleared by the rapid flow of the blood.

Dr. Korenchevsky gave an account of experiments on the artificial premature "climacteric," its effects on the process of ageing in female rats, and the influence on this process of androgenic, œstrogenic, and thyroid hormones. Ovariectomy hastened ageing of rats. The combination of androgenic, œstrogenic, and thyroid hormones produced an apparent "anti-ageing" effect, as judged by the weight and histological appearances of some vital organs; but this might be merely a temporary stimulation of ageing organs. Prolonged treatment might be followed by collapse, since the stimulants did not remove the causes of ageing.

PSYCHOLOGICAL FINDINGS

Dr. W. Stephenson read a paper for Dr. P. E. Vernon on the effects of vitamins on the mental state of senile patients at Tooting Bec Hospital. It was concluded that large amounts of vitamins exerted little effect on psychological ageing when the diet contained sufficient of these compounds. Dr. Stephenson described also some work of his own in which addition of vitamins to a diet previously deficient in these substances had been followed by improvement in the mental capacity of senile subjects. Professor Bartlett criticised the use of psychometric tests in these experiments; he held that the performance of such a test was not characteristic of senile subjects. It would be better to measure the kind of things that old people normally enjoyed doing.

Dr. Richter described an investigation on the biochemical changes in ageing. The results indicated that the mental and the physical deterioration of ageing were different processes that could be defined by their biochemical accompaniments. In advanced physical senility there were blood changes which were distinct from the changes normally occurring in old age; the changes associated with senile dementia were different again. Senility was not a simple entity, but was made up of a series of pathological processes, which should be more clearly defined by further work. Ignorance of the biochemical changes in the tissues of the ageing left a big gap in the knowledge of the subject. Muc public money was now being spent on palliative measure such as homes for old people: there was an urgen need for the allocation of more money to preventiv measures, which meant research.

Dr. J. H. Smyly gave an account of the metho developed by him for assessing physical fitness in ol men. These included exercise-tolerance tests, as measure by pulse-rate and oxygen consumption. The usu methods might be dangerous for old people.

Professor Crew, in summing up, said that the propor tion of old people in the population was increasing, an gerontology was therefore a science of growing socia importance. Geriatrics must also come to occupy place in medicine not less important than that o pædiatrics today. He recommended the formation of permanent international congress committee, to organis international gerontological congresses.

CANADIAN MEDICAL ASSOCIATION'S MEETING

FROM OUR CANADIAN CORRESPONDENT

The 77th annual meeting of the association was hel in Banff, Alberta, from June 10 to 15. The Britis Columbia branch sponsored the convention, but th Vancouver hotels were already full; so the choice fe on Banff, with its great C.P.R. hotel capable of taking thousand guests, and another large hotel 40 miles awa at Lake Louise. Every guest-house and motor camp i the neighbourhood was prepared for those who could no be cared for by the hotels.

No fewer than 889 doctors registered, but only 3 guest came from Great Britain—Sir Stewart Duke-Elder, Si Leonard Parsons (who gave the Blackader lecture o pædiatrics), and Dr. Donald Paterson. We hope tha the account they will give may encourage their colleague at home to visit the Canadian Medical Association th next time it holds its annual meeting in the West.

At the ceremonial evening Dr. Wallace Wilson (Vancouver) was installed as the new president. The next morning brought the valedictory address of the retirin president, Dr. Gérin Lajoie, of Montreal; with nationa unity in social and scientific endeavour as its theme, thi was Gallic oratory at its best.

The exhibition of works of art by members of the association was visited by everybody. The prize for a painting in oils went to Dr. R. C. Riley, a pathologist from Calgary; the prize was a bas-relief portrait of the late Sir Frederick Banting. The photographic section included the work of a score of experts, all of whom are in practice.

Everybody had a chance to see mountains and the lakes away up near the snow line. The time was too early for the poppies, but the glacier and the snow-capped mountains made a perfect setting for the cold blue jewel of Lake Louise. Lake Moraine is several hundred feet higher than Louise, and the road skirts the mountains, with towering peaks on one side and a fearsome precipice on the other; from it, the "ten peaks" came into perfect view. Nearer town was the ski-run. Only skilled and pioneer experts are allowed to use it in the winter; they climb for five hours and come down in seventy seconds.

The great mass of Mt. Eisenhower was seen best from the train, but came into view among the other peaks as the road spiralled upwards. The Albertans have not entirely discarded its old name of Castle Mountain but combine it in its new identity by referring to "Castle Eisenhower," which perhaps enhances Canada's compliment to the generalissimo. There may be more splendid scenery in the world, but medical conventions are not usual in national parks a mile above sea-level, with a regiment of rocky snow-clad mountain peaks arrayed against the skyline.

". . . The idea that the scientific and inventive mind is necessarily antagonistic to the merciful heart is as degrading to knowledge as it is untrue of the virtue of goodness. The gap between application of the two qualities is due to the selfish sides of human nature, and not to the increased power and supplies which knowledge provides for the primary needs of life."—Sir Richard Gregory, f.r.s., *Nature*, *Aug. 3, p. 151.*

Medicine and the Law

Pensions Appeals

CONTROVERSY over the Serviceman's right to a pension ntinues. Parliament may evolve a formula, but the o sides naturally attach most emphasis to those words ich best favour their own interpretation. The Service- n presses for the logical principle that, if the State und him "fit to serve," his subsequent disabilities st make him "fit for pension." The Ministry of nsions declares that it cannot accept this principle d has no power to go outside the royal warrant which verns the grant of pensions. Questions in Parliament ve made us familiar with the case of a man who, for stance, has his leg amputated while serving in the rces but is refused pension on the ground that the sease from which he is suffering is not attributable to, r aggravated by, war service. The Ministry has to ove beyond reasonable doubt that the Service condi- ns played no part in producing the disease; if it fails discharge this onus, the pension must be paid.

To some interesting judgments delivered by Mr. stice Denning in English litigation we must add the mments of the Court of Session in Edinburgh during Scottish appeal decided on July 19. The Ministry, it ems, had been relying on the fact that the claimant d a predisposition to the disease or an inherent consti- tional tendency thereto. The Scottish court made ht of predisposition. It only meant, said Lord Cooper, at, if the patient were exposed to the conditions, own or unknown, the disease would find in his constitu- n congenial soil in which to develop. The court was unable to see the relevance of such a consideration" -surely a triumph of judicial detachment. Then followed curious observation. Lord Cooper took note that, in ree out of the sixteen pensions appeals before the urt, the legal chairman had been in the minority on e issue whether the Minister had discharged beyond asonable doubt the onus resting upon him. The nsions appeal tribunal is competent to decide by a ajority, but "it appears to the court that, when the estion is the sufficiency of evidence to discharge such n onus, and when express injunction has been laid upon e tribunal to give the claimant the benefit of any asonable doubt, only powerful considerations could stify the medical and Service members in outvoting e legal chairman." The opinions of learned judges are titled to the greatest respect, but this obiter dictum nnot be accepted without protest. Parliament has nstituted a pensions appeal tribunal consisting of a gal, a medical, and a Service member, with the legal ember acting as chairman. The courts really must not nstrue the enactment as meaning a tribunal of one gal member with two assessors.

Meanwhile the Minister of Pensions has had to consider e situation arising out of the recent judgments. He formed the House of Commons on July 25 that, to move any sense of injustice, he was prepared to receive pplications from claimants whose appeals had been isallowed by a tribunal before the end of July and who ere of opinion that their claims would have succeeded the tribunal had happened to consider them after the ourts had expressed the views now promulgated. The inistry will examine the applications. If satisfied that he case is covered by the recent judgments, it will pay he pension at once. If it thinks the claim should still e rejected, the applicant will be able to take his case efore a new special arbitration tribunal outside the ramework of the Pensions Appeal Tribunal Act. The ecisions of this new type of super-tribunal must be ccepted as final. Its constitution will be similar to that f the existing statutory tribunal. It is hard to see what ore the Ministry could have done in the difficulties hich have arisen.

In England Now

A Running Commentary by Peripatetic Correspondents

FOR fifty-one weeks in the year I am, as a medical officer of health, a man of moderate dignity. During the remaining week I attend a conference, accompanied by the chairman and one or two members of the committee which controls the health activities of my urban community, and for several dreadful days become the slave of circumstance, a mere puppet at the call of those in authority. There is no escape. I live with them in the same hotel; we go together to the conference; when they get bored with the speakers I join them for a coffee, or, if we are lucky, a beer.

This personal grouse is, of course, of no general importance; but when one considers the situation multiplied by the scores of other medical officers in the same kind of predicament, an element of pathos creeps into the picture. For instance, I see another medical officer, an old colleague whose friendship I value. "Hullo, Frank," I shout. He smiles and signals cryptically. I understand; and we pass on; for he, too, has his chairman; he, too, is for one week in the year a miserable flunky.

This is the tragedy of mixed conferences, the eternal polarity of oil and water, the east and west which never meet unless in the neutrality of mediocrity. It may well be that when doctors get together they talk shop; but from their intellectual and social contacts is born a great deal of good. Here is gained a refreshment of mind; here is found a new peace because one hears of another's difficulties; here is added the needed strength to return to homely problems with a fresh hopefulness. But this promised land of a conference is always marred by the different kinds of pilgrims who yearly congregate under the banner of health: professional officials with their committee members; local-authority vassals with their lords and masters.

I find it difficult to suggest a solution. Undoubtedly the dancers and those who pipe the tune must meet at times on common ground; but let the intercourse be sweetened by brevity. I am now wondering if this personal experience of a health conference is a grim presage of things to come, when we are all public servants with personalities rounded off by the emery-wheel of officialdom and lay control. I hope that as doctors we shall ever maintain a pride in our own professional culture; that in our necessary concourse with the controlling representatives of the public and the State we shall never lose the sense of our high calling; and that, however they may judge us, we shall preserve our freedom to think well of ourselves and be worthy of the thought that inspires.

* * *

You probably don't realise what an organisation lies behind taking the Girls' Club to the Tower of London. First of all my wife had to discover the fare and the time taken on the journey so that their mothers could be told what time they would be home. Then a detailed reconnaissance had to be made, so that at any point on the way we could direct them to the nearest lavatory (small girls seem to have so much less initiative in these matters than small boys). My job was more localised—to find out the cost of admission, the best time to go, and the possibilities of a guide. The warder I spoke to was extremely helpful and obviously an artist. He anxiously inquired their ages, and was pleased that they were about fourteen. "That's the best age," he said. "They're young enough to be enthusiastic and not too young to Understand the Tower." The nearest Lyons had to be approached with a request for large-scale tea; we know from previous unhappy experience that some softening-up is necessary before invasion. A letter had to be sent to the Governor to book a guide. It had to be explained to the girls that meeting at two-fifteen meant that no lunch need be brought and that no letters of permission from their mothers were needed. No, nor pyjamas. Yes, you may bring sweets.

The journey by underground was uneventful—by club standards. The doors were unfortunately hand-operated, but nobody fell out irretrievably. The more sophisticated ones whistled at the men on the platform and the agile types swung up and down the carriage on the straps. Edie stood on one leg in an attempt to master the rocking of the train and naturally fell flat on her face. Fourteen-year-old Doreen surveyed the prostrate thirteen-year-old at her feet with great distaste and said to the carriage in general: "They do show you up, don't they?" Later, Doreen began to auction a 'Kirbigrip' but the bidding had only reached two slides and a toffee when we had to get out.

At the gate we demanded a guide and the warder asked if we had a paper. Edie timidly offered him a "True Romances" and was gently waved aside. How do they choose the warders? It says in the catalogue that they are chosen from "the most deserving N.C.O.'s in the Army," but surely they have a voice test as well? And are they trained to throw their cloaks open with such nonchalance, or is that also an inborn ability? Our man handed out murders, executions, escapes, dates, kings, queens, ghost-stories, and facts with great charm and assurance, and there were soon several dozen people round us. For good measure he added odd facts about the history of London and mentioned Smithfield, where "people were burnt for any form of religion."

We were left to inspect the White, Beauchamp, and Bloody towers by ourselves, having been warned not to miss the inscriptions carved by "hapless prisoners." Soon after this I saw Rose gazing in sympathetic horror at the pencilled signature of John West, Boston, Mass. They liked the armour and felt sorry for the horses. "Is that a real body?" "Oh, Syl*vie*, you are *silly*." "Oh look! There's some armour in Technicolor." Doreen was fascinated by the block and axe: "I bet it feels funny." When we collected them outside there were three missing, inevitably. Equally inevitably, one of them was Edie. I found them listening in rapt attention to a warder who was giving them a private talk on the nicer points of armoury. He apologised sheepishly when I arrived, but I left them to it.

Edie was very quiet on the way home. I think she was Anne Boleyn on the way to the scaffold.

* * *

When I volunteered to help with the bottling of fruit, little did I realise how much of a busman's holiday it was going to be. How like the sterilising-room is the kitchen during these episodes, with the oven as the autoclave and the kettle as the steriliser. The fruit goes into the bottles like the swabs into the drums, and the bottles are scalded just as bowls are flamed. Our womenfolk are little behind us in using the aseptic technique.

The principle is simple. The fruit is sterilised by spending an hour in the oven; and then, after boiling water has been added to the top and running over, the bottle is sealed with a rubber washer and a glass top. As the bottle cools, the cap is sucked on, and a vacuum is formed, excluding all bacteria until the day for opening arrives. This cooling-time is the critical one of the whole process, for a faulty cap will let in air and all the vacuum is lost. It cannot be hurried and at least twelve hours must pass before testing. What hours of anxiety must have been spent in the past!

Now this is where I claim to have made an important advance in technique. By one simple step, within fifteen minutes of sealing, the offending bottles can be picked out, refilled, and resealed. Auscultation of the bottles is the secret. As the air sneaks in it makes a most delightful sibilant hiss that is quite distinctive through the stethoscope. One cannot miss it, and with perfect confidence and an authoritative air one can diagnose the successes from the failures.

Any man can do the unskilled task of topping and tailing gooseberries, but we in the medical profession can rise above that. Auscultation is a specialised game, and who is better qualified to do it than the doctor's wife's husband?

* * *

As deputy public vaccinator enacting the instructions in the fourth schedule I feel as one would who was caught by one foot in the fourth dimension. The fees are paid over the top of the bureau eventually, but it never works out as planned in Form G.P.H.5. The mental ardour I put into computing the payment in 17 different categories is, as I know from R.A.F. experience, worthy of a Pathfinder navigator. I waste precious minutes wondering why the vaccination of a child who, five days after the puncture, was transferred to an unknown address 300 miles away should be worth 4*s*. 2*d*. when a Successful Vacc. is worth 6*s*. 0*d*. and an Unsuccessful Vacc. (Patient's
House, First Person) is worth nothing; two visits
made in each case and the burnt petrol smells the sa

The mileage calculation that is just three-dimensic
in this hilly practice is a fantastic mystery on four-dir
sional paper. The Register, which would be a smi
delight to any totalisator clerk, is often a joy to
because I am fond of the obsessional neatness of r
foolscap, and the thing makes a good backrest in the
car. It is a strongly bound volume, proof against mo
ness and the constant page-turning that invokes trans
nystagmus and my visual aura (migrainous). In spit
the great help that the Register often gives, F
G.P.H.5 is seldom completed, but is always "dul
returned with the Register, my good wishes, and som
my wife's secret hoard of brown paper to keep the
off. From then on there is the future vista of fo
noting refusal, demand, success, failure, vacillat
frustration, indisposition, and insusceptibility in
child of X, &c. How easy it all was when they all li
up "with the 'and hon the 'ip"! How successful it
was! So now I wonder if, perhaps, 6*s*. 0*d*. is the pric
skill and the forfeit for honesty.

As I turn over the pages of an old dusty Vacc. Regi
I read with envy the record of a predecessor who never
a failure in years.

* * *

Regimentation, and yet more regimentation. T
seems to be the order of the day. Thousands of li
prefab. huts in orderly rows. The same kind of loaf
everybody. Now dress. Utility clothes began it,
now we are all going to wear the same colour, men
women. Not a bad idea. I've seen it on a small scal
India; only there the uniformity was limited to vill
or small districts. At Palam, near Delhi, nearly all
women wear clothes of the same dark red. Near Ma
they (the women again) all wear the same purple
The spectrum is geographical. It is a lucky thing
the present political colour in England is a vivid soci
red. We won't look so drab, after all. At least th
what I thought when my morning paper informed me
August 1 that the red clothing coupons were now va

* * *

"I've just been reading in the paper about a
who gave his wife a mink coat; now, that never happ
to me." "And I've just been reading in the paper ab
a man who gave his wife a pair of black eyes," retor
her husband, "and that doesn't happen to you eith

I was moved to a recollection of that vignette
domestic felicity by the recent review of a popular w
by a versatile surgeon whose nom-de-plume provi
me with no clue to his identity. His practice is the w
of drama or perhaps even melodrama; his pati
provide a circumambiency of sensationalism. A mo
sacrifices a cornea to replace the scarred membrane
her child. The right arm of a famous violinist,
would have preferred death to the loss of this li
so shattered as to be scarcely recognisable as an arm
preserved so that its owner may be restored to his
of music. The manufacture of an artificial larynx res
in the production of a deep musical voice, though
subject of this triumph was unfortunately a foreman
a radio factory and not a celebrated tenor. In
humdrum surroundings of a store, a shopkeeper,
victim of a malignant growth, lived in a world peo
by Shakespeare's characters. His poetical utteran
impressed the surgeon with the importance of sav
his life. No wonder the enthusiastic reviewer refers
"the revelations of modern surgery where skill of h
is sometimes controlled by the heart as well as by
brain." And so I pondered. Why don't these thi
ever happen to me?

None of us are immune to the practice of day-dreami
Just as the kitchen-drudge and the hack-clerk seek ref
at the pictures from prosaic occupations and proj
themselves into romance, so I, in my humble world
medicine, conjure up visions of situations and episo
of which I am the hero—of performing operations wit
the capacity of at most three men in the professi
of brilliant diagnoses elucidating problems which h
baffled my most eminent colleagues; of preserving
lives of public characters of world-shaking importan
Yet about the most exciting experience most of
encounter is a conviction for exceeding the speed li
or riding a bicycle without a light.

Letters to the Editor

RELEASE OF SPECIALISTS

SIR,—Once more Sir Ernest Graham-Little has proved mself the champion of the Services medical officer asking the Secretary of State for War whether he as aware of the wastage of specialist man-power in ie Forces, in particular of orthopædic and surgical ecialists (*Lancet*, Aug. 10, p. 217).

Mr. J. J. Lawson's reply that he was not aware of any astage of specialists in the Army will strain the credulity quite a proportion of surgical specialists at present rving. To meet surgical specialists who are "supernmerary to establishment" or are "attached to a ommand specialist pool" is not uncommon; those so aced are not necessarily employed in their specialty nd, as often as not, are employed as general-duty ficers, performing such duties, in the majority of cases -let it redound to their credit—with a good will.

The Army is rapidly becoming a "younger army," nd the proportion of young conscripts and recruits increasing. For this reason surgical procedures are ss frequently indicated and are mostly confined to the pair of hernia (admittedly never lightly to be under- ken) and to the treatment of varicose veins and hydrocele. The remainder comprise minor surgical rocedures well within the experience of a graduate 2–3 years' standing. Army surgical practice is istinctly limited in its scope, for several reasons: in ie first place, it is predominantly directed towards the ale; secondly, the Army comprises a section of the opulation in which surgical emergencies are bound be relatively infrequent; thirdly, most surgical rocedures practised today are of the type already escribed—surely a surgeon's scope should be wider than is even in these days of specialism; and fourthly, wing to the examination of the conscript and recruit y a medical board whose standards are now higher, ie men at present entering the Army are, in the main, ealthy.

Mr. Lawson's contention that he is not prepared single out *Army-trained specialists* (my italics) for ly release as it would break down the basis of release age-and-service group priority does not bear examina- on. In the R.A.M.C. alone, general-duty officers have een released in groups at least ten in advance of ecialists and therefore the Secretary of State for War ould not be creating a precedent by "singling out" rmy-trained specialists for early release. The basis as already been broken. Does this statement then iggest that he is prepared to single out for release *lly qualified* specialists?

Only two days ago, the *Times* (Aug. 8, p. 2) published ie releases from the Forces for the period Oct. 1–ec. 31, 1946, announced by the Minister of Labour nd National Service in which the officer releases from ie Army for that period consist of age-and-service roups 40–46. Can the Secretary of State for War aintain that the basis of release by age-and-service roup priority has not been violated, when the declared leases for R.A.M.C. specialists by Sept. 30, 1946, onsist of groups up to and including group 35? At the ime of writing, no policy for the release of specialists yond group 35 has yet been declared by the War Office, lthough the Central Medical War Committee in reply Aug. 7) to a request for information on this matter ave kindly ascertained that "it *is hoped* (my italics) hat the release programme for the period Oct. 1–Dec. 31 ill be published within the next few days."

W. R. BLACK
Major R.A.M.C.

TREATMENT OF MENINGITIS

SIR,—The most retrograde step in therapy since the ntroduction of penicillin has surely been its use ntrathecally in cases of nontraumatic meningitis. It salutary, therefore, to learn from the article by Sir Hugh Cairns and his colleagues (Aug. 3) that streptoycin used intrathecally was largely ineffective and aused a high incidence of unfavourable reactions. When streptomycin becomes available in this country s systemic use will be of the greatest value; may its intrathecal use be confined to those traumatic cases rightly under the care of the neurosurgeons.

There was a time when we treated meningitis in children by repeated punctures—lumbar, cisternal, and (in infants) ventricular—injecting antimeningococcal serum and washing it through. If the child recovered it was felt that a great therapeutic victory had been won. However, it was later found that just as good results were obtained if the theca was left severely alone after doing a single lumbar puncture for diagnostic purposes and giving large doses of antiserum intravenously and intramuscularly. With the advent of the sulphonamides this impression was strengthened and confirmed. Full doses of a sulphonamide, sedation, hypertonic rectal salines, and quiet, produced the best results.

With the advent of penicillin, intrathecal therapy has come into fashion again. I believe that any case which has recovered after intrathecal therapy has recovered in spite of this interference and not because of it. Sterilisation of the cerebrospinal fluid will not necessarily cure a child with meningitis, nor is recovery directly dependent on the sulphonamide or antibiotic content of the spinal fluid. Meningitis is a systemic disease and intensive systemic therapy is the best form of treatment.

Warwick. WILFRID F. GAISFORD.

PROSTATIC CANCER

SIR,—I have read Dr. Gutmann's letter on adrenalectomy for prostatic cancer (Aug. 3) with great interest. Like him, I have considered attacking the pituitary directly by radiation. After consideration, however, it seemed best to avoid over-inhibition of the pituitary by periodic administration of œstrogens. For some two years, at the Meath Hospital, Dublin, we have been giving œstrogens for alternate weeks only, hoping thus not to excite the adrenals into compensatory overproduction of androgens.

With such a small and short experience it is not possible to make any definite statement or claim. It can be said, however, that from the clinical point of view the intermittent administration of the œstrogens seems, so far, to be as effective as the continuous.

Dublin. T. J. D. LANE.

C.CM. OR MILLILITRE?

SIR,—Dr. Beaumont in his letter of Aug. 3 is so concerned with what he considers to be the impropriety of converting cubic centimetres into millilitres that he seems to have lost sight of the subject of my first letter, the fact that the millilitre and not the cubic centimetre is the correct subdivision of the litre and that the cubic centimetre should never be used as an alternative to the millilitre with which it has no connexion.

He does not agree that my suggestion to convert cubic centimetres into millilitres is a valid procedure for ordinary medical purposes. In this he is not supported by the *British Pharmacopœia* (1932) which states (p. 639) that the millilitre (not the cubic centimetre) is the proper subdivision of the litre and gives a conversion-equivalent which justifies my advice.

Dr. Beaumont refers to the predicament in which he finds himself of having to use a syringe graduated in cubic centimetres, but apparently does nothing about it beyond saying that he likes to call a cubic centimetre a cubic centimetre. For himself he can do as he likes, but for the sake of others he should convert into millilitres in deference to the official nomenclature of the *British Pharmacopœia* and the fundamental reasons on which that nomenclature is based.

If he persists in an outmoded and incorrect nomenclature there is nothing more to be said except perhaps to add that his self-made difficulties could be resolved if he and other clinicians arranged with manufacturers to graduate syringes in millilitres. Scientific workers have long ago done this for their measures of capacity. It is a reproach to clinicians that they lag behind.

London, S.W.7. J. M. HAMILL.

PS.—Since writing the above I have seen a pamphlet on Penicillin Treatment by Dr. Beaumont and Dr. Palmer. In this pamphlet millilitres are used throughout even when measuring from a syringe. I congratulate Dr. Beaumont on his adoption of the correct nomenclature.—J. M. H.

THE NATIONAL LOAF

SIR,—THE LANCET took a brave share during the war in the battle for a pure and nutritious national loaf, a battle which succeeded after three years' struggle (1939–42) in compelling the Ministry of Food at long last to supersede the 70 % extraction of the national loaf by an 85 % extraction from April, 1942. The "discovery" (of dubious sanction) that high-extraction flour was rendered positively dangerous for human consumption by the presence in the germ of a constituent (phytic acid) which militated against the assimilation of "calcium" was the springboard for the decision taken by the Ministry of Food to add chalk to the national flour as a means of combating this supposed ill effect. This addition was hotly criticised in your columns and I submit that the addition has lost authority in the intervening years. The whole-wheat grain has formed the staple diet of the human race for immemorial ages ; it is surely repugnant alike to common sense and to universal experience to pretend, as a certain small section of opinion contends, that high-extraction flour for the national bread unless "fortified" by chalk is positively mischievous.

It is to be noted, incidentally, that the Ministry of Food in its communications to the public and even in parliamentary answers has consistently avoided the use of the word "chalk" to describe this addition ; it has been variously camouflaged as "calcium," which is a misdescription, and as "creta," which is its Latin equivalent, unintelligible to the great mass of the public who are thus, I submit, deliberately misled.

Alterations in the composition of the national flour have been made in the last five years with bewildering frequency, mostly in the form of secret instructions to controlled millers. The community contributes the not inconsiderable sum of £35 million per annum as a subsidy for bread alone ; it is surely entitled to be fully informed, in intelligible language, what it is eating from time to time. I accordingly, in a parliamentary question, requested the Minister to give an undertaking that the public should be immediately informed of any change in the composition of national flour, and the Minister gave me that undertaking (*Hansard*, July 8, 1946). On July 24 the Ministry of Food issued to controlled millers a circular headed "confidential, not for publication" which required them to double the quota of chalk, camouflaged as "calcium," in the national flour. On July 29 the Minister received a protest from me in the form of a parliamentary question, pointing out that this undertaking had not been observed, and on the following day the Minister saw fit to inform the press of the alteration in composition.

The practice began in 1940, and has continued ever since, of making extraneous additions to the national flour supposed to "reinforce" its value, until the Ministry's "prescription" for national bread reads rather like a description of a patent medicine. This tendency was severely criticised (*Times*, Oct. 26, 1940) by the late Sir William Bragg, perhaps the most famous president of the Royal Society in our times. The words he used then are as pertinent now as when they were uttered. He wrote :

> "Science is built on the accumulation of experiences and every scientist knows that he must not base his conclusions only on the last few experiments in the laboratory. . . . Practice is based on the experiments of innumerable years . . . the knowledge thus gained in ages of trial and error are all of value ; they are not to be thrown aside in favour of the last galvanometer reading. . . . In this *matter of food the scientist is at the present time insisting that certain old ways are best* . . ."

and he went on to point out that the nutrition of the nations reached its highest level "when milk and vegetables, fruit and *whole-meal* bread (the italics are mine) were commonly consumed."

London, W.1. E. GRAHAM-LITTLE.

DEMOCRATIC NURSING

SIR,—The excellent article by Mr. Sol. M. Cohen contains many suggestions which, if practised, would be of inestimable benefit to all working in hospitals.

However the idea of a full democratic development must extend, too, to those who lay down rules for administrators. The following is an extract from t duties of a matron enclosed with an application form f a recently advertised vacancy :

> . . . She shall inspect all the wards each day and th also make similar visits at uncertain hours not less o than once weekly during the night . . .

The suggestion contained in this paragraph is t neither the ward sisters nor those in charge at are to be trusted in carrying out their normal duti Until nurses in charge of wards are given a position responsibility and trust, comparable to that of a physici or surgeon in charge of wards, ward sisters' posts w remain unattractive.

I recently questioned 50 nurses on completion of th State examinations ; less than 10 % of these girls desir to remain in general hospitals or to become ward siste This is a very serious reflection on present attitudes both municipal and voluntary hospitals. "Lip servic on the value of ward sisters will not suffice.

Central Middlesex County Hospital, HORACE JOULES
London, N.W.10.

MALE NURSES

SIR,—To the constructive observations of Mr. H. J. Atkins (July 13, p. 63) might be added the comm that enough use is not yet made of the trained gen male nurse. *He is in fact unknown to the aver* general hospital, and, as the *Male Nurses' Jour* recently said, "up to the recent war, some of the medi profession had never heard of a male S.R.N."

Eighteen to twenty years ago there were only training schools for male student nurses ; today th are 51, with others affiliated, and 1 for training infectious diseases. Nevertheless, further numbers mi still be trained and employed, particularly now wh valuable potential nurses are being demobilised from Forces.

The male nurse is almost always keen, and unl some female nurses he remains permanently in profession, which he regards as his life's work. ethical standard is no less rigid than that of the qu fied practitioner.

A new spirit prevails nowadays. The "starc dictator" is gradually vanishing, and greater relia is being placed on the team spirit. In my own dep ment the theatre sister is a man, and half of the cli nursing staff are males ; and we find that female nu work contentedly with a male "ward sister."

Finally, it may be noted that, while increasing us certainly being made of the male tutor, there are some with the diploma of nursing who have not fo suitable employment. WILLIAM ITTER, S.R.N

Department of Urology, General Hospital,
Newcastle-upon-Tyne.

PROPHYLACTIC PENICILLIN

SIR,—The extension of the use of penicillin to prophylactic field is an obvious one, and it is be widely and increasingly so used in surgery at the pres time. I would, however, like to comment on two po raised by Mr. R. Wood Power in your issue of July

Firstly, his statement that postoperative thromb is caused by infection is not in accord with the wei of present-day evidence or opinion. But apart f theoretical considerations I have had a case of postoperative pulmonary embolism proved by p mortem in a patient whose infection had been comple cleared up by penicillin. It was a case of a carbu which resolved as a result of the giving of 1,600, units of penicillin. A granulating area was left wh was bacteriologically sterile. and some days after area had become sterile a skin-grafting operation performed. The patient died suddenly thirty-six ho after operation from pulmonary embolism. It co of course, be argued that the thrombus developed be the infection was cleared up. But a case such as t added to theoretical considerations, shows that strong positive evidence will have to be brought forw before penicillin can be regarded as a prophylactic aga thrombosis and embolism.

The second point I would like to comment on is use of penicillin in the prophylaxis of postoperat chest complications. I have had two patients ten days after operation developed chest complicati in spite of earlier prophylactic courses of 500,000

,000 units of penicillin. In both cases the inflamma- r trouble was at the bases of the lungs, and clinically ı radiologically seemed to be secondary to collapse. was thought that the collapse may have developed r operation but that immediate inflammatory nomena were prevented by the penicillin.

Vhile not detracting in any way from the extreme ue of penicillin in the prevention of infective pul- nary complications after operation, these cases do phasise that the other factors, chiefly of a mechanical ure, that are concerned in these complications must be combated.

ondon, W.1. DAVID H. PATEY.

SUPPLY AND DEMAND

SIR,—Your annotation under this heading on June 29 most revealing.

During the war, in correspondence in the medical and press, attention was frequently drawn to the civilian actitioner carrying on under great difficulties, and sing only for assistance, and the chance of a "rest" the Forces. To those of us enjoying this "rest" from ngenial work and the presence of our families, this cture always seemed to be a trifle overpainted: We cepted it, but with reservations.

How justified were these reservations is now fully parent. The only body that is displaying any eagerness our assistance is the Army, which has deferred our lease as "operationally vital" until relieved by doctors sh from the hardships of civilian life.

R.M.O., M.E.F.

AID TO DEFÆCATION

SIR,—Some years ago when recovering from an attack lumbar fibrositis I found myself with a difficulty in fæcation owing to any effort at straining being painful. hile at stool I began to rub my lower back to relieve e stiffness, mainly along the line of the lumbar muscles the left side down to the middle of the buttock, and ted after rubbing for a minute or two that the rectum nptied itself easily and with comfort. This appeared obably to be due to reflex stimulation acting through e posterior branches of the spinal nerves. I have ied the effect many times since whenever there was a ndency to constipation, without the use of any laxa- es, and have found it almost invariably successful. hether it acts by stimulating the rectal musculature contract, or whether it relaxes the pelvic sphincter d allows the passage of fæces into the rectum and eir evacuation as a consequence, I have been unable to etermine. No doubt the sceptic will say that the real planation is that more time is allowed for natural nctions to come into play through the time taken in assaging the back, but that is not the case.

Possibly others may find the experiment worth trying. he effect is perceived a minute or two after the massage, hich need not be carried on for more than a minute so. Perhaps it might be described as *vis a tergo* in ntrast with the frontal attack of the usual laxatives.

C. W. B.

NFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED AUG. 3

Notifications.—Smallpox, 0; scarlet fever, 940; hooping-cough, 2092; diphtheria, 246; paratyphoid, yphoid, 60 (54 in Cardiganshire); measles (excluding ella), 3540; pneumonia (primary or influenzal), 356; erebrospinal fever, 44; poliomyelitis, 23; polio-ence- halitis, 1; encephalitis lethargica, 1; dysentery, 59; uerperal pyrexia, 146; ophthalmia neonatorum, 72. o case of cholera, plague, or typhus was notified during he week.

The number of service and civilian sick in the Infectious Hospitals the London County Council on July 31 was 908. During the revious week the following cases were admitted: scarlet fever, 54; iphtheria, 25; measles, 59, whooping-cough, 32.

Deaths.—In 126 great towns there were no deaths from nteric fever or scarlet fever, 1 (0) from measles, 7 (0) rom whooping-cough, 1 (0) from diphtheria, 36 (6) from iarrhœa and enteritis under two years, and 4 (1) from nfluenza. The figures in parentheses are those for ondon itself.

The number of stillbirths notified during the week was 05 (corresponding to a rate of 31 per thousand total irths), including 37 in London.

Public Health

Typhoid at Aberystwyth

UP to Aug. 12 105 patients had been admitted to hospitals in Wales, and less than a dozen others, suspected of having been infected at Aberystwyth, were in hospitals in England.

Inquiries lead to the conclusion that in the large majority of the patients infection occurred on July 11. Four-fifths of them reside in the borough and rural district of Aberystwyth, and it appears that the most heavily infected portions of ice-cream were consumed by local inhabitants attending church excursions and a youth rally and were not available on a large scale to the ordinary holiday-makers.

The number of cases ascertained from day to day is now beginning to fall. The infection is of only moderate severity, but more deaths are expected.

The suspected carrier is a urinary excretor. Up to the present *Bact. typhosum* has not been found in his stools after four examinations. The organism recovered from his urine belongs to Vi-bacteriophage type C. Organisms of the same type have been recovered from several of the patients.

Poliomyelitis near London

The occurrence of cases of infantile paralysis in three London suburbs has attracted the attention of the daily press. The position is not unusual and the incidence not untoward. Notifications in England and Wales during the six weeks ending Aug. 3 were 8, 9, 12, 10, 18, and 23. In the corresponding weeks of the previous year they numbered 8, 15, 12, 16, 22, and 21, and the upward trends express the usual seasonal rise.

Pre-existing foci were at Barnet and Potters Bar, but during the past week single cases have been diagnosed at Malden and Coombe borough, Sutton and Cheam borough, and Merton and Morden urban district.

Obituary

GEORGE RONALD PYM ALDRED-BROWN

M.A., D.M. OXFD

Dr. G. R. P. Aldred-Brown, consulting physician to the Royal National Hospital for Rheumatic Diseases, died at his home in Bath on July 26. Seven years ago a serious illness had forced him to give up some of his work, but his interest in the hospital was unabated, and he had lately taken a leading part in the development of its occupational therapy department. For some months he had not been well, and last year he retired from the active staff of the Royal National, where for 9 of his 15 years' service he had been senior physician.

Born in 1896, the son of the late Richard Aldred-Brown, controller-general of education in the Egyptian civil service, he was educated at Harrow and Oxford, where he entered Keble College with a natural science scholarship. He broke off his studies to serve, during the 1914–18 war, in the Royal Field Artillery, reaching the rank of captain, and on his return in 1918 he completed his medical course at the London Hospital, graduating B.M. in 1924. Before settling in Bath he held the appointments of pathologist and bacteriologist at the Dorset County Hospital, and his published work included papers on the blood sedimentation-rate and plasma proteins. In 1936 he also published in our columns an article on radiography of the hand in chronic rheumatic diseases—describing the careful investigation of 154 consecutive cases. Last year his growing interest in reablement was responsible for a paper on spa treatment and the injured workman in the *British Journal of Physical Medicine*. A member of the International Society of Medical Hydrology, he was for some years treasurer of the British section. His friends at the Bath Club will remember his expertness at billiards, and he was also keen on golf and lawn-tennis.

Dr. Aldred-Brown married Miss Doreen Crowe in 1925, and she survives him with a daughter, who is at Bristol University.

Notes and News

FOR THOSE IN DIFFICULTIES

In its 26th year the Professional Classes Aid Council report as usual much timely help to professional men and women, or their dependants, who have fallen on hard times. Some, being elderly, are no longer able to work for themselves; others are young and need help to complete their education. Some £3700 has been spent on school fees and outfits for children, and more than £1500 on help to 31 women and 16 men students, of whom 11 were medical students. Many people have had temporary help in time of sickness. The total income of the council for the year came to £14,052, of which nearly £3000 was derived from investments. Happily the year ended with £1658 in hand instead of the deficit of recent years. To maintain their work at the present standard, however, the council will need generous support in the coming year. Those wishing to help should write to the secretary, 20, Campden Hill Square, London, W.8.

University of Cambridge

Mr. *G. D. Greville*, D.SC., has been appointed lecturer in biochemistry.

University of London

Mr. W. C. W. Nixon, F.R.C.O.G., has been appointed to the university chair of obstetrics and gynæcology tenable at University College Hospital medical school, from Oct. 1. For the past two years he has held the chair of obstetrics in the University of Istanbul.

Dr. Ronald Hare has been appointed to the university chair of bacteriology tenable at St. Thomas's Hospital medical school, from Oct. 1.

The title of professor of physiology has been conferred on Mr. W. R. Spurrell, F.R.C.S., in respect of his post at Guy's Hospital medical school.

The title of reader in physiology has been conferred on Mr. L. E. Bayliss, PH.D., in respect of his post at University College; and the title of reader in pathology on Dr. S. J. De Navasquez, in respect of his post at Guy's Hospital medical school.

University of Sheffield

Prof. C. P. Beattie has been appointed to the chair of bacteriology from Oct. 1, in succession to Prof. Wilson Smith, who has left the university to occupy the chair of bacteriology at University College Hospital medical school.

Professor Beattie was educated at Fettes College and the University of Edinburgh, where he graduated M.A. in 1926 and M.B. in 1928. He held an appointment as house-surgeon at the Royal Infirmary and was president of the Royal Medical Society, Edinburgh. In 1930 he obtained the D.P.H. After bacteriological experience in the hospitals and University of Edinburgh, he went, with a Rockefeller fellowship, to the United States and to France, returning to Edinburgh in 1933 as a lecturer in bacteriology. In 1937 he left this country to become professor of bacteriology in the Royal Faculty of Medicine, Iraq; in Bagdad he started the government bacteriology laboratory, which is the bacteriological centre for the whole of Iraq, charged with the preparation of protective vaccines and sera as well as the conduct of bacteriological examinations. Among other duties he set up a quarantine laboratory for the examination of pilgrims returning from Mecca. His researches have covered a wide field, and he has taken a special interest in undulant fever.

University of Durham

Mr. John Boyes, L.R.C.P.E., L.D.S., has been appointed *Nuffield professor of oral medicine.*

North Persian Forces Memorial

The North Persian Forces memorial medal will be awarded again next year, after a lapse of nine years.

This memorial was founded in 1923 by officers of the Royal Army Medical Corps and Indian Medical Service who served with the *North Persian Forces during the war of 1914–18. It is a silver medal* and is awarded annually for the best paper by a single author on tropical medicine or tropical hygiene published during the twelve months ending Dec. 31 by any medical officer of under 12 years' service in the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or Colonial Medical Service. Only officers on a regular or short-service engagement are eligible for the award.

A Gift from Sweden

In recognition of medical attendance to Swedes during the war, Sweden recently presented some X-ray equipment to the National Hospital, Queen Square, London. It includes a special Swedish invention in this field—namely, a precision apparatus for cranial radiography, constructed by Prof. Erik Lysholm, of the Serafimer Hospital, in Stockholm, and built by the firm of G. Schönander.

Central Council for Health Education

Lord Woolton has been re-elected president of the council, Sir Allen Daley and Dr. Charles Hill vice-presidents, and Mr. E. G. Savage treasurer. Mr. Henry Lesser, LL.B., has been elected chairman of the council, and Dr. E. K. Macdonald vice-chairman.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. T. KEITH LYLE, F.R.C.S., 42, Charles Street, Berkeley Square, W.1.
Mr. G. C. SAWYER, M.S., F.R.C.S., 6, St. John's Road, Leicester
Dr. J. D. SPILLANE, 110, Cathedral Road, Cardiff.

Medical Diary

AUG. 18 TO 24

Thursday, 22nd

EDINBURGH POSTGRADUATE LECTURES

4.30 P.M. (Royal Infirmary.) Dr. R. M. Murray-Lyon: Ætiology and Diagnosis of Amœbiasis.

Appointments

BICKFORD, R. G., M.B. Camb., M.R.C.P.: research in neurology, Mayo Clinic, Rochester, U.S.A.

BINNING, REX, M.B. Camb., M.R.C.S., D.A.: anæsthetist, Royal Sussex County Hospital, Brighton.

BUCHANAN, D. S., M.B. Durh.: county M.O.H. and school M.O., Huntingdon.

FOSTER, F. G., M.D. Edin.: M.O.H., Birkenhead.

FRESHMAN, EDGAR, M.B. Manc., F.R.C.S.: consulting urologist, Ramsgate General Hospital.

GOODWIN, J. F., M.D. Lond., M.R.C.P.: first asst., medical unit, Royal Infirmary, Sheffield.

HART, F. D., M.D. Edin., M.R.C.P.: physician, Royal Waterloo Hospital, London.

MACPHERSON, IAN, M.D. Leeds, M.R.C.P.: asst. physician, General Infirmary, Leeds.

MEIR, M., M.B. Birm.: asst. surgeon, District Infirmary, Ashton-under-Lyne.

MILLIS, G. C., M.C., M.D. Camb., M.R.C.P.: physician, Royal Waterloo Hospital, London.

MOFFATT, P. McG., M.D. Lond., M.R.C.P., F.R.C.S., D.O.M.S.: consultant ophthalmic surgeon, central medical staff, L.C.C.

MOORE, THOMAS, M.D., M.S. Durh., F.R.C.S.: asst. surgeon, District Infirmary, Ashton-under-Lyne.

RICHMOND, J. H., M.B. Camb.: examining factory surgeon, Wolverhampton no. 1 district.

SEYMOUR-JONES, J. A., M.B. Camb., F.R.C.S., D.L.O.: registrar, Portsmouth and Southern Counties Eye and Ear Hospital.

SMAILES, T. W., M.B. Camb.: examining factory surgeon, Hor Yorks.

SMYTHE, P. M., M.B. Camb.: first asst. and registrar, children's dept., London Hospital.

STEWART, A. B., M.D. St. And., D.P.H.: M.O.H., Paddington (subject to approval of Ministry of Health).

THOMPSON, SYDNEY, M.D. Durh.: dermatological specialist medical referee for county-court districts of Alnwick, Berwick-on-Tweed, Consett, Gateshead, Hexham, Morpeth and Blyth, Newcastle-on-Tyne, North Shields, South Shields, Seaham and Sunderland (circuit no. 1).

THOMPSON, VERNON, M.B. Lond., F.R.C.S.: asst. surgeon, thoracic dept., London Hospital.

TREBLE, H. A., B.M. Oxfd, M.R.C.P.: consulting dermatologist, Ramsgate General Hospital.

WALTON, W. S., M.D. Durh.: M.O.H., Newcastle-on-Tyne.

Births, Marriages, and Deaths

BIRTHS

COLWILL.—On August 4, at Edgware, the wife of Dr. C. K. Colwill—a daughter.

DAYNES.—On August 4, in London, the wife of Dr. Guy Daynes—a son.

EDNEY.—On August 6, the wife of Dr. Roy Edney, of Ashford, Middlesex—a son.

GARWOOD.—On August 4, at Hove, Dr. Dorothea Garwood (Leslie-Smith), wife of Lieut.-Colonel J. C. Garwood, D.S.O., R.E.—a daughter.

RUTHERFORD.—On August 4, at Brighton, the wife of Dr. Raymond Rutherford—a son.

THOMSON.—On August 4, the wife of Dr. J. L. S. Thomson, of Winchmore Hill, N.21—a daughter.

TOMLINSON.—On August 4, the wife of Dr. A. J. H. Tomlinson, of Howitt Road, N.W.3—a daughter.

WILLIAMS.—On August 7, at Swansea, the wife of Mr. Bernard L. Williams, F.R.C.S.—a son.

MARRIAGES

EASTON—LATHAM.—On July 29, in London, Alfred Leonard Tytherleigh Easton, M.R.C.S., to Josephine Mary Latham.

REID—PEDLER.—On July 25, in London, Douglas Andrew Campbell Reid, M.B., M.R.C.S., to Margaret Joyce Pedler.

DEATHS

SLATER.—On July 30, at Godalming, William Arnison Slater, M.R.C.S.

THORNE THORNE.—On August 5, Vernon Thorne Thorne, M.B. Camb., D.T.M. & H., Colonial Medical Service, Nigeria, aged 41.

SERIOUS PSYCHIATRIC DISABILITY AMONG BRITISH OFFICERS IN INDIA

R. F. TREDGOLD
M.B. Camb., D.P.M.
LIEUT.-COLONEL R.A.M.C.

G. KELLY
L.R.C.S.I.
MAJOR R.A.M.C.

H. N. HEFFERNAN
M.R.C.S.
CAPTAIN R.A.M.C.

P. R. W. LEIGH
B.M. Oxfd
MAJOR I.A.M.C.

SPECIALISTS IN PSYCHIATRY

I. Analysis of Clinical Material

A STUDY has been made of a group of 150 British fficers with psychiatric illness necessitating their ischarge from the Army or evacuation to the United Kingdom. The hospital in Western India at which his work was done took all such cases from all over ndia and SEAC. No selection has been made except o omit a few cases with inadequate clinical records..

The numbers seemed large enough to warrant an nvestigation of whether the factors involved could be modified to save the wastage of officers, and whether nformation could be obtained which would be of value o selection boards. This investigation can scarcely e regarded as a follow-up of the previous work of he selection boards, since only a few of the officers n this group had passed through the present type f War Office or G.H.Q. selection board. All were dmitted during 1944.

INVESTIGATION

To collect information, a proforma was designed as ollows:

Name ....
Unit ....
Age ....
Total service ....
Indian service ....
Commissioned service ......
Selection board ....
Diagnosis ....
Progress ....
Disposal ....
Previous personality ......
Family history ....

Predisposing factors
(*a*) Action ....
(*b*) Frustration ....
(*c*) Domestic ....
(*d*) Physical ....
(*e*) Inadequacy ....

Precipitating factors:
(*a*) Action ....
(*b*) Frustration ....
(*c*) Domestic ....
(*d*) Physical ....
(*e*) Inadequacy ....

An attempt was made to assess the importance in each case of the following factors:

Previous Personality.—These were considered as (*a*) major defects which had interfered with the patient's work or taken him under treatment: and (*b*) minor defects, such as solitariness, oversensitiveness, and ineffectiveness, which would have been obvious to the skilled observer but might not have (and in some cases had not) prevented their owner from being passed by a selection board.

Family History.—This was investigated from the point of view of (*a*) a home broken by separation, divorce, or death of the parents; and (*b*) a definite history of psychological illness in parent or sibling.

Predisposing factors were those which had been in operation for some three months at least before breakdown.

Precipitating factors were those which occurred just before the onset of the symptoms.

Both predisposing and precipitating factors were split into five groups: (1) enemy action; (2) frustration; (3) domestic; (4) physical; and (5) inadequacy for job.

FINDINGS

The findings have been analysed in tables I–V. Table I shows the incidence of the various disorders n the different arms of the Service, separated into orward and base areas. The following points are shown more easily in separate tables.

(1) The forward-area cases of all types amount to only 20% of the total, whereas the forward-area psychotics comprise 30·4% of all psychotics (table II).

(2) The proportion of forward-area to base-area cases is considerably greater in the Service Corps and infantry than the average, and far higher than in sappers and doctors (table III).

(3) The proportion of schizophrenia to anxiety is higher in infantry officers than in other arms (table IV).

(4) The relative distribution of all officers in the various arms of the Service in India and SEAC, as shown in table I, is only approximate. But it is permissible to note that these 150 cases included 18 doctors (16 from base areas) and 21 sappers (19 from base areas).

(5) The incidence in age- and service-groups would again be liable to mislead, if shown without the distribution of all officers. But it was observed that there was a group of men who broke down within a year of disembarkation, especially within the second six months of that year (31 cases out of the 150). Also that the highest incidence of breakdown was in officers with over 4 years' total service (95 cases); the next highest peak was between 2½ and 3 years' total service (14 cases).

Table V shows the relative importance of factors other than age- and service-groups in the various syndromes.

II. Discussion (R. F. TREDGOLD)

Owing to the fact that the four of us have been scattered, a full interchange of views on the clinical work reported above has not been easy and has been more by writing than by speech. While, therefore, I have incorporated in the following discussion numerous suggestions made by one or the other of my colleagues, and am most grateful for these, the final conclusions must be regarded as my own responsibility.

TYPES OF CASES

The figures are too small to be of much significance, but anxiety states comprised 42·6% of all cases. The association of alcoholism in 6 cases aggravated the condition by producing further inadequacy and irritability, and sometimes criminal irresponsibility. Depression provided only 5·3%, being equalled by paranoid states and outnumbered by manias and hypomanias together.

It was noted by Craigie (1944), in his review of two years' psychiatry in the Middle East, that mania and depression there occurred in approximately the same proportions. This is in contrast, in my experience at least, to conditions in England in 1941, where depression was considerably commoner than mania. The proportion of the two combined compared to schizophrenia was in India approximately 2 : 3 and in Craigie's cases approximately 1 : 3, while in a military mental hospital in 1941 in U.K. it was approximately 1 : 1. This change is undoubtedly partly explained by the fact that the term "depression" is now used more strictly than in U.K., and cases previously labelled "depressive states" would fall into the new nomenclature's "anxiety state." Apart from this, however, there appears to be a real increase in India of manic states, of which the precise cause is difficult to ascertain. Clinically, the cases which were generally slow in onset were slow in progress. Elation was less marked than overactivity, and persecutory ideas were common, being usually, and perhaps not unnaturally, referred to the restrictions necessarily imposed on the patient's military career. It is a possible field for speculation whether an increase of mania is a response to a prolonged sense of urgency engendered by total war.

Schizophrenic states formed nearly 20% and tended to run the course associated with this syndrome in war-time. They were, moreover, associated in many cases with exogenous factors (see below).

INCIDENCE AT THE BASE

The number of breakdowns in base areas is much greater than in forward areas. There are two possible

TABLE I—INCIDENCE OF DISORDERS IN THE GROUP ACCORDING TO ARMS OF THE SERVICE

Diagnosis	Total	Infantry		Engineers		Medical		Artillery		Service		E.M.E.		Ordnance		Armoured		Others	
		Base	Fwd	Base	Fwd	Base	Fwd	Base	Fwd	Base	Fwd	Base	Fwd	Base	Fwd	Base	Fwd	Base	Fw
Anxiety, and anxiety plus alcohol ..	64	7	5	8	1	9	..	6	2	2	1	4	..	6	..	2	1	9	1
Hysteria	12	1	..	..	..	..	..	4	..	1	..	..	1	1	..	1	..	3	..
Post-traumatic ..	3	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
Toxic	4	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..
Psychopathic personality	11	1	..	2	..	..	1	1	..	..	..	2	..	..	..	..	..	4	..
Schizophrenia ..	29	6	4	2	1	3	..	1	1	1	2	2	..	1	1	1	..	2	1
Paranoid state ..	8	..	..	2	..	1	..	..	..	..	..	1	1	..	..	..	..	2	1
Cyclothymia, hypomania, and mania	11	1	2	2	..	3	1	..	..	..	..	..	..	..	..	..	..	1	1
Depression	8	2	..	3	..	..	..	..	..	1	1	..	..	1	..	..	..	..	..
Total ..	150	20	11	19	2	16	2	13	3	6	4	9	2	10	1	4	1	23	
Percentage distribution: Psychiatric cases	100	13·3	7·3	12·7	1·3	10·7	1·3	*8·7*	*2·0*	*4·0*	*2·7*	*6·0*	*1·3*	*6·7*	*0·7*	*2·7*	*0·7*	*15·3*	*2*
Total officers (approximate estimate) ..	100	8·0	6·0	7·0	6·0	9·0	4·0	2·0	6 0	4·0	4·0	2·0	1·0	4·0	1·0	1·0	3·0	21·0	12

The percentage distribution of all British officers in the various arms, in base or forward areas, for the period under review, is unfortunate not available in exact detail but appears to be of the above order.

explanations for this: (1) that in a base area there is a higher proportion of potentially unstable officers; and (2) that the stress in the base areas is greater.

The first explanation would be supported by the observation that the cases here included some who had been given their base jobs because they had been found inefficient elsewhere; in fact, they were throw-outs sent, often in a lower rank, to do what was regarded as a softer job. Inquiry showed that they had never been anything but a menace to an efficient office.

The second explanation appears unlikely. In fact, the reverse is the official opinion of the Directorate of Selection of Personnel (1944): "The staff officer's dealing with persons is . . . carried out under far less emotionally difficult conditions." This, however, is in my opinion open to question. It is true that the infantry officer may at times be exposed to physical and mental strain of a kind and intensity never experienced by his colleague at base headquarters; but this is for very limited periods in between which he is probably physically healthier, and (which is more important) more satisfied. He can, moreover, give vent to his aggressive impulses, and he obtains satisfaction from the crumbs of glory thrown to him by the daily press and from occasional decorations. It is easier for him to feel one of a team; his results and objectives are nearer.

TABLE II—INCIDENCE OF DISORDERS IN FORWARD AND BASE AREAS

Diagnosis	Forward	Base	Total
Anxiety, and anxiety with alcohol	11	53	64
Hysteria	1	11	12
Post-traumatic	..	3	3
Toxic	..	4	4
Psychopathic personality ..	1	10	11
Schizophrenia	10	19	29
Paranoid state	2	6	8
Cyclothymia, hypomania, and mania	4	7	11
Depression	1	7	8
Total	30	120	150

The staff officer, on the other hand, has little or n physical exercise, long office hours, and less hope obtaining promotion by death of his seniors. Thoug the typewriter may be mightier than the machine-gu he seldom has the satisfaction of using the keys himse as an outlet, and any anger or irritation he feels is mo likely to be vented on other departments than on th enemy. In these circumstances it is no wonder th acid letters, childish squabbles over unimportant detail and abuse of rank are known. Once they arise, the aggravate the condition, and there can be few formation where *no-one has thought:* "*We could get on* with th war if only they would let us" ("they" being the ne higher formation). Conversely, the higher formation i quick to sense affronts to its own dignity or infringemen of its rights by the lower, and "So-and-so's private army division, or area" is a term symptomatic of this feeling

McCurdy (1943) has analysed very clearly the reason for the frustration felt by an officer, especially junio with technical competence who ends by "cursing re *tape, cursing his superiors, cursing the stupidity* of th official mind. But there may have been no obstructiveness, but everywhere a desire to do one's best." Balchin's picture in *The Small Back Room* expresses such feelings most graphically.

Other evidence of this tension is the sense of "being out of it," which nearly all base officers display. Termed by some "non-combatant guilt," this may be underlying shame at not being exposed to personal danger when others are, particularly if these are close friends or likely, after the war, to be close neighbours. The projection of this feeling is the cause of the emotion engendered in base areas over anyone suspected of "shirking."

It must, therefore, be seriously considered whether there *is not as much psychological stress to* be encountered by officers in base areas as by those in moderately close contact with the enemy. The figures of incidence in this *study seem to support this suggestion.*

In any case, there can be no doubt that the diminution of the stress described in base areas is a problem of high practical importance. On the efficient *functioning* of staff work depends, obviously, the success of the battle. It is as dangerous to clutter up staffs with unsuitable officers as it is to put potential psychiatric casualties in tanks. The result may be less striking and less easy to assess, but the loss of efficiency to the whole Army can be assured.

The first step to a solution is a realisation of its complications; for example, it is much easier to accept an over-severe letter, if it is viewed rather as a symptom of frustration than as one of a permanent attitude of mind (bloody-mindedness); and the recipient is more likely to indulge in satisfactory action than in a counter-attack. (In the same way it is easier for a doctor to accept the rudeness of a patient, which he knows to be symptomatic of underlying psychological trouble, than the plain speaking of an apparently reasonable friend. This sometimes produces the paradox that the more reasonable the friend, and the advice, the more resentment is felt and the less is the advice followed.)

This realisation can undoubtedly be helped by visits; the officer who has been previously but an illegible signature or an indistinct voice on the telephone surprisingly becomes a human being.

It would also be valuable to see that the public (and so the staff officer too) are kept informed of the need for, and the importance of, staff work in continuing the war.

Physical exercise, regular leave, or at least a change of scene, and some time off once a week, are essential. Such measures may be scorned by the strongest of us but will influence the weaker, who are here our problem. It is the lack of all the above which damages the individual's sense of proportion and sense of humour, which should be firm sheet anchors of his stability.

TABLE III—FORWARD- AND BASE-AREA CASES IN SEVERAL ARMS

Area	Service Corps	Infantry	Engineers	Medical	Others
Forward ..	4	11	2	2	11
Base ..	6	20	19	16	59

If efficient planning is essential, those who provide it should be honoured as much as the combatant, and every effort should be made to bridge the gulf which splits the Army. In parentheses, it is questionable whether arm-bands, which accentuate the difference between staff and combatant, serve a useful purpose.

SPECIALISTS

(1) The proportion among the R.A.M.C. and I.A.M.C. is very disturbing. It has been noted elsewhere, and Reider (1944) produced an interesting explanation. He suggested that doctors were largely attracted by the feeling that they had power of life and death over their fellows or by a narcissistic satisfaction of being closer to God. He considered that this was impossible in the less personal framework of the Army, and that the M.O. suffered from its loss.

Even if this theory were accepted, it would not seem a full explanation; for opportunities for "narcissistic satisfaction" are by no means absent from the ordinary M.O. and to some extent are encouraged by his brother officers in the mess. It seems more probable that other factors have more weight: lack of physical fitness, and so lack of resistance to intercurrent infection; some, but incomplete, knowledge of the possibilities of tropical disease; and lack of personal morale, owing either to inability to vent one's aggressive tendencies as well as one's fellow, or to the proximity in base hospitals of many patients whose morale is lower than that of men in the front line.

TABLE IV—INCIDENCE OF VARIOUS DISORDERS IN SEVERAL ARMS

Diagnosis	Infantry	Engineers	Medical
Anxiety states	12	9	9
Schizophrenia	10	3	3
Cyclothymia, hypomania, and mania..	3	2	4
Other diagnoses	6	7	2
Total	31	21	18

Alternatively, it has been suggested that the doctor's basic ideology is brought into sharp conflict with the needs of the military machine. This, however, is scarcely such a conflict (for most doctor's efforts are still directed to healing, directly or indirectly) as that experienced by the average citizen called on personally to learn to kill.

(2) The number of sappers also calls for inquiry. These, again, were predominantly from base areas rather than field units. The patients appeared to have done a comparable job perfectly satisfactorily in England but to have soon failed in India. They were asked why

TABLE V—RELATIVE IMPORTANCE OF FACTORS IN VARIOUS SYNDROMES

Diagnosis	Total	Previous personality defects		Family history		Predisposing factors					Precipitating factors						
		Gross	Minor	Bad environment	Bad heredity	Action	Frustration	Domestic	Physical	Inadequacy	Nil	Several	Action	Frustration	Domestic	Physical	Inadequacy
Anxiety	58	6	20	9	5	10	3	10	11	18	..	8	6	9	18	12	21
Anxiety complicated by alcoholism	6	..	1	..	1	1	1	4	..	2	..	4	1	1	4	2	2
Hysteria	12	..	7	1	..	..	3	3	1	6	1	5	1	3	4	5	6
Post-traumatic	3	..	1	..	..	1	..	..	1	..	..	..	..	..	..	2	1
Toxic psychosis	4	..	1	..	..	..	..	..	1	1	..	2	..	..	..	4	2
Psychopathic personality with emotional abnormality ..	11	2	8	1	2	1	..	3	..	4	1	..	..	..	3	1	6
Schizophrenia	29	4	13	2	6	2	4	2	2	7	4	6	9	4	4	8	6
Paranoid state	8	1	1	..	1	1	1	1	..	2	1	2	1	3	2	2	2
Cyclothymia	2	1	1	..	1	..	1	1	1	..	..	2	..	1	2	1	..
Mania	4	1	3	..	1	..	..	1	..	2	..	..	2	..	1	1	1
Hypomania	5	..	1	..	..	..	1	2	1	..	2	2	3	..	..	2	..
Depression	8	1	1	1	3	..	1	..	2	1	1	1	1	..	3	2	2
Total	150	16	58	14	20	16	15	27	20	43	10	32	24	21	41	42	49

they thought this was. The following extracts are an answer:

> ". . . Apart from the usual troubles of language difficulties, dumb insolence, very often assumed, maybe, physical differences of race, methods of execution of work, and the age-old lacking of drive and will-chase to get a job done. Those things one can expect but cannot realise their depth until experienced. There is one great factor, which will in time bring *many* Works Service personnel to you, or very nearly, and certainly demoralise many previously industrious and keen men—that is, graft."
>
> "I have fought hard against becoming 'bolshy'—when surrounded by discontented men—but having had much time to think, I find that anyone coming to India even 100% fit, not war-weary or overworked in the past, any reasonably conscientious person who is anxious to do his job, get on and do as much as he can, knowing that a large number are really fighting; that person is going to find himself against a brick wall."
>
> "I was recommended for my majority within nine months of *joining the army—so feel I'm adaptable to changed* conditions. When engineers are sent out in the 35–40 age, with quite a lot of building experience, let a psychiatrist watch their postings, or (better still) give them an emotional test as part of their home medical for tropical service."

By some these comments will be regarded as the outpouring of an unstable man, anxious to justify his failure. It is my opinion, on the contrary, that they should merit very careful consideration. They are by no means exceptional and have been confirmed by men who had no psychiatric disorder.

Generally speaking, specialist corps appeared also to feel frustration more than did combatant officers, partly because they were more often kept hanging about without a job than were infantry officers, partly because it galled them more that their expert knowledge was being wasted. It was not rare for officers to leave England under the impression (probably accurate) that there was a great demand for them in India, but to arrive at a unit where no-one seemed either to expect or to welcome their coming. Vague promises of promotion implied in England were obviously only likely to be fulfilled after a considerable delay—if at all.

AGE- AND SERVICE-GROUPS

Unfortunately the relative proportions of various age-groups among British officers throughout the Indian theatre of war cannot be assessed, but it may be noted that the proportion of psychoneuroses, mostly anxiety states, in men of less than 30 and more than 40 years of age was very considerably higher than in the age-group 30–40. The psychotics, most of whom were schizophrenics, again tended to occur before 30 years of age.

The relative scarcity of serious psychiatric conditions among those of less than $2^{1}/_{2}$ years' total service is obvious, as is the gradually increasing burden of longer service. Nearly 60% had been serving at least since Dunkirk, where they had no doubt acquired some predisposition. Many had had commissions all the time or been passed early in 1942 by the older form of board.

The length of service overseas is of interest in that the heaviest incidence occurs in those with less than a year's service, and after this is spread out more or less evenly from $1^{1}/_{2}$ to 3 years.

It may further be noted that among those who broke in less than a year the preponderance was of young schizophrenics and psychoneurotics.

The fact that over 30% of the patients broke down so severely within twelve months of arriving in India is a disturbing reflection. Few of these men had been exposed to enemy action or had physical ailments. The important factor, as will be later discussed, was inadequacy in their unit. This is probably explicable on one of several grounds:

(1) That men were deliberately sent out to India who were not wanted in U.K. when preparations were in progress *for the Second Front.*

(2) That lack of coördination in posting led at times, as discussed above, to leaving a man, busy enough at home, in idleness here.

(3) That men previously satisfactory and adequate in U.K. were unable to be so in India, either because of separation from home, physical weakness, complete lack of preparation for local difficulties, or several factors combined.

Many officers arrived with preconceived ideas about India which did them no good. Either they had heard tales of "the brightest jewel in the crown of the Empire" and were ill prepared for the need for quarrying away the dirt to get at the jewel, or their natural mild home-sickness was allowed to become exaggerated on the boat and projected on the various alleged drawbacks of India: poverty, squalor, and corruption which those of previous experience described luridly. There were further, the mild attacks of diarrhœa and excessive sweating due to climatic conditions, to all of which they had to adapt themselves.

Again, commissioned service was commonly less than a year, or between $2^{1}/_{2}$–3 years. The explanation for this is obscure, but it is probable that some were men who had been commissioned in U.K. soon after Dunkirk and, after serving some six months there, had been exposed to moderate but prolonged stress in India.

FAMILY HISTORY

The proportion of broken homes among these cases may be higher than in a normal cross-section of the population, but the figures are scarcely significant. Hereditary factors were noted in over 25% of the psychotics.

Marriage.—The number of married and single men has not been recorded, since the details were not considered full enough to give any reliable evidence. It is felt that such figures would tend to mislead, unless a more profound study of the patients' reaction to marriage than was possible could have been made. The report made by Hastings et al. (1944) on the Eighth U.S. Air Force showed that the young fliers, unencumbered by domestic responsibility, were on the whole the more stable and it suggested tentatively that it might be wise to forbid marriage for one or two years after graduation from flying training. This suggestion takes no account of those, who must have existed, whose stability was increased by marriage and the founding of a family.

PERSONALITY TRAITS

It was noteworthy that as many as 12 had evidence of a previous major breakdown. As might be expected not one of these had passed through a W.O. or G.H.Q. selection board, though they had been selected after an interview by a (non-medical) board. Only 12 of all the 150 officers had seen a W.O. or G.H.Q. selection board.

The number of minor personality changes may be considered in more detail. This question is obviously very closely bound up with the number of such traits which could be found by careful questioning in the total population, on which very different views are held. Close statistical survey is obviously required before we can come to any definite opinion on the matter, and no detailed study will here be made of the number of so-called psychoneurotic traits (nail-biting, &c.). Instead, attention was concentrated on minor defects which had interfered at some stage with their adaptation to army life, and hence their value. Briefly, they were mostly signs of inability to mix or assert oneself. These were present in 39% of the total, mostly in the hysterics, the psychopathic personalities, and the schizophrenics. Moreover, in these they were associated with feelings of inadequacy at work, which had before been generally kept within bounds but recently had increased rapidly.

PREDISPOSING AND PRECIPITATING FACTORS

In all but a very few cases, both predisposing and precipitating factors were evident, but they were of ferent groups which, perhaps, bore some relation to the vious personality.

Enemy Action.—It is perhaps noteworthy that enemy tion did not play a larger part, especially when it is nembered that all British officers being evacuated for ychiatric conditions from India and SEAC within is period would be included within this group.

Also, it was the schizophrenic whose breakdown s precipitated by action. It might be argued that the hizophrenics got as far as the enemy because they peared, to their colleagues, to be perfectly normal d so were not "eliminated," whereas the psychopaths d hysterics were prevented by O.C. or colleagues om running risks. There may be some truth in this, t it would not be on a large scale. One psychoth got as far as the enemy. Although in such cases e might expect a previous loss of initiative, war schizophrenics" are atypical, and it is possible that e explanation is rather that these schizophrenics had mething the others (psychopaths and hysterics) had ot got—initiative and drive—which positive factors ould have outweighed, at least in the eyes of comrades nd commanders, their negative disadvantages—a point hich perhaps has implications regarding the value of ssessing positive qualities as well as negative. Men ith undoubted personality defect can be accepted nd can be of value if (but only if) these defects are ounterbalanced by the possession of some initiative, genuity, intelligence, and courage.

Frustration was an important factor in more cases nd contributed to anxiety, hysteria, and schizohrenic and paranoid states, colouring, as might be xpected, the clinical picture.

Frustration also prevented the recovery of convalescent fficers from the difficulty of obtaining satisfying employnent for them. A vicious circle was again likely, as is asy enough to understand. Officers who were the very ype to need consideration at the start of a new job were ften by their nature least likely to get it. The waits and isappointments on arriving at a new unit, which may ometimes be regarded as inevitable in such a complex nachine as the Army in India, and accepted by most vith resignation, were taken by weaker brethren as an asy target on which to project their separation anxiety, and irritation with their senior officers became almost as ixed in them as intense dislike of India was among those whose target was the Indian scene.

Domestic stress largely led to anxiety and was common nough. Examples of stress were bereavement, worry over illness, financial loss, post-war prospects, and concern over real or suspected infidelity, though this last concern is less common among officers than among other ranks.

The *physical disabilities* were generally severe attacks of amœbic dysentery, malaria, or infective hepatitis. Though I would be the last to propose that any of these conditions are without psychological effect on their own unfortunate victims, the results in the cases quoted were not often due to this; rather they were due to the impression which was allowed to gain strength in the patient's mind (at his first attack and onwards) that he was unusually predisposed to such conditions, or unusually weakened by them, and that he would never be well again till he returned to U.K. In such cases, especially in dysentery, as might be expected, symptoms persisted, and this reinforced his conviction. Treatment, to be of any value, had to be given in the very early stages before this idea became fixed; unfortunately, it often was not. As Menninger (1943) puts it, "the end-result was not a blood-stream infection or a gastrointestinal disease, but a disorder of the whole organism —a disorder of thinking and living."

Inadequacy was common among the anxiety states, he schizophrenics, the hysterics, and the psychopaths. In anxiety states and schizophrenia it was generally a secondary effect, due to the illness and later aggravating it. The hysterics and the psychopaths were naturally inadequate and in no way capable of shouldering normal responsibilities.

PROPOSALS

It can scarcely be denied that the wastage of officers on this scale is serious in its military effects and, possibly, in its medical and social implications. This must be the excuse for discussing such a statistically small number and for venturing to draw conclusions and suggesting proposals to counteract the existing factors.

Breakdown soon after arrival is dangerously common. It is due partly to bad selection, completely inadequate officers having been sent. Some were literally worse than nobody, for they were a dead weight on their units —in particular their C.O.s—and on the medical services. If there were no-one better to send, it would have been better to send no-one.

Selection should obviously be carried out by the machinery of the Directorate of Selection of Personnel. The selectors should beware of young immature men who may not be able to adapt to separation, especially if there are any suggestions of hysterical reactions or emotional abnormality.

Breakdown is also due to a combination of physical ill health, homesickness, and frustration, all of which reinforce each other directly (and indirectly, in that they prevent improvement). This could to some extent be prevented by insisting that mental adaptation to various difficulties must be made before disembarkation. For this purpose a clear statement of what is to be expected, and what will have to be endured physically and mentally, would be beneficial.

The breakdown of many officers after four years' service may well be explained on grounds of fatigue or "war-weariness," which was perhaps inevitable. There is no doubt that if breakdown develops in the few loss of efficiency will develop in the many, and it was wise to base demobilisation on age plus length of service. It was, on the whole, in the officers with long service that domestic stress and physical ill health had most effect. It is probably fair to conclude that it would be improved if long periods of leave at home could be granted after considerably shorter service.

A closer understanding by those in base areas of the reasons for the stresses they undergo might minimise their effect and at the same time promote closer sympathy and coöperation between formation headquarters.

SUMMARY

A study has been made of 150 British officers evacuated on psychiatric grounds from India and SEAC, and an attempt to analyse the various factors concerned in each is described.

Tables of this analysis are shown, and comments are made on the relative importance of the different factors.

Proposals are made to diminish the strength of the operative factors and to call for a closer selection of officers for overseas service.

Our thanks are due to Major-General H. C. D. Rankin, then D.D.M.S. Southern Army, India Command, and to Colonel G. Moulson, then commanding an Indian base general hospital, for permission to publish these findings and for much helpful criticism.

REFERENCES

Craigie, H. B. (1944) *Brit. med. J.* ii, 105.
Directorate of Selection of Personnel (India) (1944) Techn. Memo. no. 8.
Hastings, D. W., Wright, D. G., Glueck, B. C. (1944) Psychiatric Experiences of Eighth Air Force, published by J. Macy Jun. Foundation, U.S.A.
McCurdy, J. T. (1943) The Structure of Morale, London.
Menninger, W. C. (1943) *J. Amer. med. Ass.* 123, 751.
Reider, N. (1944) *Bull. Menninger Clin.* 8, 55.

VITAMIN A AND SKIN DISEASE

Z. A. LEITNER
M.D. Berlin, L.R.C.P.E.
CLINICAL ASSISTANT, ST. MARY'S HOSPITAL, LONDON

T. MOORE
D.Sc. Belf., Ph.D. Camb.
DUNN NUTRITIONAL LABORATORY, UNIVERSITY OF CAMBRIDGE, AND MEDICAL RESEARCH COUNCIL

CLINICAL research on vitamin-A deficiency as a cause of skin abnormalities has developed in several phases. The first phase originated in the observation that skin lesions were often a complicating factor in people with eye lesions, which were later attributed to deficiency of vitamin A. Thus the association of keratomalacia and xerophthalmia with dry scaly skin was noticed by de Gouvêa (1883), Mori (1904), and Bloch (1921). In groups of adult Chinese with keratomalacia, Pillat (1929) and Frazier and Hu (1931) found that the skin was dry and covered with flakes of horny epithelium. They also observed, on the extensor surfaces of the arms and legs, a characteristic eruption of raised papules, which resulted from the blocking of the hair follicles with cornified material. The condition of the skin was much improved by a diet rich in vitamin A. Loewenthal (1933) noted similar lesions in East African prisoners. The papular eruption was present in all cases having xerophthalmia or defective dark vision, and was cured by the administration of cod-liver oil without any other treatment. Nicholls (1938) reported that symmetrical papular eruptions, with dryness and scaliness of the skin, were common among inmates of Ceylonese prisons. The condition was associated with xerophthalmia and keratomalacia, and sometimes with dysentery and neuritis. Nicholls called the skin lesions phrynoderma, a Greek version of the native name of toad-skin.

In this country Goodwin (1934) described a single case with papular eruptions which he considered to be due to vitamin-A deficiency, and which was cured by a suitable diet and cod-liver oil. Youmans and Corlette (1938) had similar experience with 20 cases in America. In infants Helen Mackay (1934) found that the provision of additional vitamin A above that present in the ordinary diet decreased the incidence of sore buttocks, intertrigo, and napkin rash. Lehman and Rapaport (1940) observed follicular papules in association with defective dark-adaptation in American families in receipt of financial relief, and cured both abnormalities by giving massive doses of vitamin A for several months. In India, however, workers in Aykroyd's laboratory found that the severity of eye and skin lesions did not always run parallel, and they raised doubts whether vitamin-A deficiency was the sole cause of phrynoderma (Aykroyd and Rajagopal 1936, Aykroyd and Krishnan 1937, Rao 1937).

Fitzgerald Moore (1940) has emphasised the importance of distinguishing the effects of vitamin-A deficiency from those of pellagra, and Wiltshire (1919) pointed out that in scurvy a condition of follicular hyperkeratosis occurred which was very similar to that of vitamin-A deficiency. Stannus (1945) and Leitner (1945) have also questioned the specificity of vitamin-A deficiency as the cause of phrynoderma and similar conditions, which Stannus considers are identical with keratosis pilaris as seen in this country.

Vitamin A in Common Skin Diseases.—In a second phase of research the problem has been attacked from the opposite direction. Instead of studying skin lesions in subjects believed to be suffering from vitamin-A deficiency, workers have examined the adequacy of the vitamin-A status in subjects with skin disease. The methods of approach adopted by different investigators have included estimations of vitamin A in the blood-serum by chemical methods, the examination of dark-adaptation, and the observation of the clinical effects of dosing with vitamin A.

Marchionini and Patel (1937) found that the serum-vitamin-A level was lowered in eczema and psoriasis but normal in furunculosis. In nearly 300 patients with various skin diseases, Schneider and Widder (1938) reported that the average carotene was 25% below normal and vitamin A 36% below normal. Gross (1941) found that cases of nummular eczema were often cured with large doses of vitamin A, and Cutler (1940) also claimed that the combined administration of vitamins A and D was beneficial in eczema, and even went so far as to suggest vitamins have an anti-allergic action.

In atrophic eczema, besides other allergic conditions, Spector et al. (1943) found a defective absorption of vitamin A, as indicated by an abnormally low increase in the serum after heavy dosing. Similarly, in infants with severe generalised eczema associated with retarded development, lymphadenopathy, and respiratory infections, Sant' Agnese and Larkin (1943) found that the absorption of vitamin A was insufficient.

In spite of some measure of agreement between the above-mentioned workers, Cornbleet et al. (1944) found that in patients with common skin diseases the serum-vitamin-A level was always above the "lower normal limit."

Porter and Godding (1945a) found no abnormality in the dark-adaptation of patients with common skin diseases.

Vitamin A in Rare Skin Diseases.—A third phase of research may be recognised in the recent interest in the significance of secondary or conditioned deficiency of vitamin A in the ætiology of some rare skin diseases, chiefly of hereditary origin.

Darier's disease, in which the essential lesion is a keratosis of the mouth of the follicles, is characterised by firm pin-head-sized confluent papules which soon become crust-covered and later produce vegetating papillomatous growths. The eruptions usually appear on the face and neck and may spread all over the body. Peck et al. (1941, 1943) reported that the serum-vitamin-A level was low. Treatment with massive doses of vitamin A (200,000 I.U. daily) not only increased the serum-vitamin-A level, but also in almost all cases had a favourable clinical effect. They suggested that Darier's disease was due to hereditary or acquired weakness in the absorption of vitamin A, or in the conversion of carotene to vitamin A. In support of this conclusion several other workers (Barwasser 1941, Cannon 1941, Sweitzer 1942, Michelton 1942, Abramovitz 1942) all reported one case each, which usually improved after treatment with vitamin A. The experience of Carleton and Steven (1943), however, was somewhat inconclusive. Dark-adaptation was normal in all cases of Darier's disease at their disposal. The serum-vitamin-A level was low in only one out of four cases, but two improved clinically when given moderately large doses of vitamin A (20,000 I.U.). Pettler (1942) observed no clinical improvement in a case of Darier's disease given massive doses of vitamin A.

Devergie's disease, or pityriasis rubra pilaris, is a chronic exfoliating skin affection in which the papules coalesce to form reddened scaling areas, which spread over parts, or sometimes the entire surface, of the body. The course of the disease is chronic and irregular, with unexpected exacerbations, and there is a tendency for the lesions to become generalised in the form of an exfoliating erythrodermia.

Cures in two patients who were dosed with vitamins A, B, and D were reported by Pettler (1936), and carotene was later found to be effective in one patient (Pettler 1942).

One aged woman was cured by Arquello (1940) with massive doses of vitamin A, but Thomas (1943) obtained no response in an aged man. Brunsting and Sheard (1941) cured defective dark-adaptation in three patients with this disease with daily doses of 150,000 I.U. of vitamin A. The skin was improved in two of their cases, and became stationary in the third. Peck and Chargin (1941) cured one patient of extensive lesions by massive dosing with vitamin A.

The experience of Weiner and Levin (1943) was perplexing; though they successfully treated the skin lesions in five patients by dosing with vitamin A and carotene, they could not before treatment detect any abnormality in the levels of these substances in the blood, nor in dark-adaptation. Cornbleet et al. (1944), however, found that the plasma-vitamin-A level was low in a boy with pityriasis rubra pilaris. In contrast the plasma carotene was high, and they concluded that the problem must be one of incorrect utilisation or transformation of the provitamin rather than of dietary deficiency or defective bsorption.' Porter and Godding (1945b) found in a single atient that dark-adaptation was subnormal and was cured, nd the skin lesions considerably improved, by protracted dosing with vitamin A.

In *ichthyosis*, another rare disease, Rapaport et al. (1942) found that the skin lesions were associated with poor dark-adaptation, and that both abnormalities were improved by giving large doses of vitamin A. In agreement with these findings, Peck, Glick, and Chargin (1943) observed that the plasma-vitamin-A level was low in ichthyosis; but, though the serum-vitamin-A level was increased by dosing, the improvement in the skin was hardly outside the usual seasonal fluctuation.

Glazebrook and Tomaszewski (1944) investigated the vitamin-A status in a man with Hodgkin's disease, with severe injury to the liver and general ichthyosiform atrophy of the skin. There was great deterioration in dark-adaptation, and the serum-vitamin-A level was very low. A further indication of abnormality was found in the excretion of small amounts of vitamin A in the urine, from which it is invariably absent in normal subjects.

Primary and Secondary Deficiency of Vitamin A.—The relation of vitamin-A deficiency to skin disease seems therefore to be complex. It seems clear that the follicular lesions may arise from several causes. Thus they occur in hypovitaminosis C (Wiltshire 1919) and in subjects in whom no dietary deficiency might be expected (Stannus 1945). The differential diagnosis of the various causes of follicular lesions, if always possible, is obviously very difficult. Moreover in patients who are cured with vitamin A, particularly in Darier's disease and pityriasis rubra pilaris, we must not neglect the possibility of the spontaneous remissions which are an occasional feature in these diseases.

TABLE I—PLASMA-CAROTENOIDS AND PLASMA-VITAMIN-A LEVELS IN COMMON SKIN DISEASES

Group	No. of cases	Mean values (I.U. per 100 ml.)	
		Carotene	Vitamin A
Eczemas	26	109	126
Pityriasis rosea	5	119	92
Psoriasis	10	161	117
Seborrhœa	11	144	128
Lupus vulgaris	4	214	84
Lichenifications	13	139	123
Acne vulgaris	4	99	119
Rosacea	8	100	122
Skin infections	11	132	119
Alopecia	5	186	114
Pruritus	3	139	128
Verruca	1	84	101
Urticaria pigmentosa	1	55	78
Erythema nodosum	1	170	127
Lymphogranuloma inguinale	1	106	73
Pityriasis lichenoides chronica	1	104	284
Means for above 105 cases	..	130	120
Keratosis follicularis	6	126	74
Pityriasis rubra pilaris	2	150	97
Ichthyosis	3	105	71
Means for all 116 cases	..	130	116

TABLE II—PLASMA-CAROTENOIDS AND PLASMA-VITAMIN-A LEVELS IN CONTROLS

"Normal"	41	161	118
Accidents	4	141	78
Fractures	12	102	92
Arthritis	18	145	114
Varicose veins	19	110	123
Herniæ	18	133	110
Hæmorrhoids	4	139	117
All controls	116	139	113

Answers are required to at least three distinct questions: (1) Has it been proved conclusively that in tropical or oriental countries dietary deficiency of vitamin A does in practice cause skin disease? If so, are the diseases ascribed to vitamin-A deficiency due solely to this defect? (2) Are common skin diseases in temperate countries caused or aggravated by dietary deficiency of vitamin A? (3) Can the evidence be accepted which suggests that secondary deficiency of vitamin A, resulting from abnormal metabolism, is an important feature in certain rare skin diseases?

There was no opportunity in the present work to study vitamin A in tropical skin diseases. From the examination of vitamin A and carotene in numerous dermatological subjects in this country, however, we have obtained evidence which may be valuable in answering the second and third of the above questions.

EXPERIMENTAL

Material.—The present paper gives the results of chemical estimations of carotenoids and vitamin A in the blood-plasma of 116 subjects treated for various skin diseases either as private patients or as outpatients at St. Mary's Hospital. Most of the specimens were collected between November, 1944, and March, 1945, but 18 specimens were obtained before this period. In subjects with common skin diseases specimens were usually taken on a single occasion only, but in selected cases of Darier's disease or of pityriasis rubra pilaris serial estimations were made, and the effect of massive doses of vitamin A on the level in the blood was examined. To serve as controls, specimens were collected over the same period from healthy subjects, or from patients suffering from accident, fracture, arthritis, varicose veins, hernia, or hæmorrhoids. Cases involving pregnancy, hypertension, or other conditions believed to affect the blood-vitamin-A level were excluded from the control group.

Methods.—The technique differed only in minor refinements from that of Kimble (1939), as modified by Yudkin (1941) and by ourselves.

The plasma (6 ml.) was shaken with alcohol and petrol ether. Carotenoids were estimated in the extract, after suitable clarification, by their natural yellow colour. The extract was then evaporated, and vitamin A estimated by the blue colour produced on treatment with antimony trichloride, an allowance being made for the colour contributed by carotenoids to this reaction. Both yellow and blue colours were measured in a photoelectric absorptiometer provided with suitable filters.

In calibrating this instrument against a specimen of vitamin-A acetate a conversion factor of 1600 between $E^{1\%}_{1\text{ cm.}}$ 328 mμ and I.U. of vitamin A per g. was assumed. The calibration for carotenoids was against the international standard solution of β-carotene, and for convenience results have been expressed as though all the carotenoids of the plasma were β-carotene. Owing to the presence of xanthophyll, α-carotene, &c., the actual "biological value" of the carotenoid fractions was presumably somewhat less than the figures given.

Results.—The mean values for plasma carotenoids and vitamin A in various skin diseases are given in table I. For all types of skin disease combined, the average values were 130 I.U. for carotenoids and 116 I.U. for vitamin A. These figures are almost identical with the corresponding means of 139 and 113 I.U. found for the controls (table II).

In agreement with general experience the individual values for carotenoids and vitamin A varied over a wide range in both the dermatological and control subjects. If, however, we fix arbitrary limits of 0–80 I.U. as indicating low values for either carotenoids or vitamin A, 81–160 I.U. as indicating medium values, and over 161 I.U. as indicating high values, there again appears to be little difference between the two series. The percentages of cases falling within these limits were as follows:

		Percentage of cases		
		Low	*Medium*	*High*
Carotenoids	Skin disease	21	55	24
	Controls	16	54	30
Vitamin A	Skin disease	22	63	15
	Controls	22	65	13

Since secondary deficiency of vitamin A has been reported in Darier's disease, pityriasis rubra pilaris, and ichthyosis, our data for patients with these diseases are summarised in table III. Mean values are given for all the specimens of plasma collected from each subject while still uninfluenced by vitamin-A therapy. Other columns give the lowest recorded values found without vitamin-A therapy, and the highest values found after massive doses of 100,000–240,000 I.U. of vitamin A had been given over prolonged periods.

TABLE III—PLASMA-CAROTENOIDS AND PLASMA-VITAMIN-A LEVELS IN CERTAIN RARE SKIN DISEASES

Disease	Case	Age (yrs)	Sex	Before dosing				After dosing
				Mean values		Lowest values		Highest value of vitamin A
				Carotenoids	Vitamin A	Carotenoids	Vitamin A	
Darier's disease ..	1	13	M	102	78	100	55	556
	2	33	F	171	92	59	55	..
	3	61	F	215	57	199	20	687
	4	31	M	90	57	57	7	790
	5	53	F	62	55	61	28	1846
	6	19	F	113	106	95	103	..
		Means..		126	74	95	45	970
Pityriasis rubra pilaris	7	14	M	41	48	31	46	408
	8	41	F	158	145	110	66	690
		Means..		100	97	71	56	549
Ichthyosis ..	9	26	M	98	86	77	80	..
	10	13	F	72	72	65	49	..
	11	32	F	145	55	145	55	..
		Means		105	71	96	61	..
Combined means ..				116	77	91	51	830

Our findings indicate that the plasma-vitamin-A level is often, but not invariably, low in these diseases. In comparison with the mean value of 116 I.U. found in the controls, the mean for Darier's disease was 74 I.U., for pityriasis rubra pilaris 97 I.U., and for ichthyosis 71 I.U. For all 11 patients the mean was 77 I.U., as against 113 I.U. for the controls. In only one instance was a mean value obtained which exceeded the mean value for the controls. Eight cases at one time or another gave values which were less than half the average for the controls.

In subjects given massive doses of vitamin A the plasma-vitamin-A level always rose eventually to very high levels, in one instance (case 5) reaching nearly 2000 I.U. In each subject the values after dosing fluctuated considerably. This may have been due in part to difficulty in ensuring that the specimens should be collected at a constant interval of five hours after dosing, which was intended to coincide to the point of maximal absorption of the vitamin into the blood-stream.

In case 7, a boy with severe pityriasis rubra pilaris, the plasma-vitamin-A level did not respond normally to massive doses of vitamin A during the early stages of therapy. Thus after two months' treatment with up to 150,000 I.U. daily of vitamin A the plasma-vitamin-A level was only 82 I.U. In contrast to the experience of Cornbleet et al. (1944), the plasma carotenoids were also consistently low and, during eighteen months' observation, had a mean value of only 71 I.U. In this patient the galactose tolerance, serum-choline esterase, and hippuric-acid tests indicated impairment of liver function, which was probably the cause of the poor response of the plasma-vitamin-A level to dosing.

The fall of the plasma-vitamin-A level after the discontinuance of massive dosing with vitamin A was studied in case 5 with Darier's disease and in one normal subject. In each case there was a rapid decrease during the day after the last dose, which was followed by a slower decline to a constant level slightly above the mean value for the controls. Thus case 5 gave a value of 522 I.U. at five hours after her last dose, 200 I.U. after twenty-four hours, 135 I.U. after three days, and 118 I.U. after three weeks. The control had 1120 I.U. at five hours after dosing, 156 I.U. after thirty hours 131 I.U. after a week, and 126 I.U. after two weeks. Too much importance need not be attached to the difference shown by the two subjects at five hours after dosing, because the rate of change in the plasma-vitamin-A level at this point is obviously very rapid. On several other occasions case 5 gave values of over 1000 I.U.

The clinical course after dosing with vitamin A in Darier's disease and pityriasis rubra pilaris varied in different patients. The vitamin therapy was combined with treatment with Grenz rays, and any improvement for which the vitamin might have been responsible was assessed by the inspection of areas of skin not exposed to the rays. In two young patients with Darier's disease dosing with vitamin A was followed by complete or nearly complete recovery. In other subjects such progress as was observed might well have been due to spontaneous remissions. Case 5, in whom the highest plasma-vitamin-A level was found after dosing, did not show any clinical response to therapy. The two cases of pityriasis rubra pilaris both improved during dosing with vitamin A, but neither was entirely cured. No cases of ichthyosis were treated.

Some of the above-mentioned cases were demonstrated at the Royal Society of Medicine (Leitner 1946, Moore 1946) and all are still under observation.

DISCUSSION

The results of our investigation do not favour the view that vitamin-A deficiency is prominent in common skin diseases in this country. Our failure to detect any difference in vitamin-A status between groups of dermatological and control subjects is in agreement with the recent conclusions of Cornbleet et al. (1944) and of Porter and Godding (1945a) and in contrast with the claims of many earlier workers.

As regards Darier's disease, pityriasis rubra pilaris, and ichthyosis our data give limited support to the conclusion that secondary deficiency of vitamin A may be a significant factor. It must be emphasised that in none of these diseases have we observed vitamin-A values consistently under 40 I.U., which is the level below which there is danger of functional deficiency of vitamin A, as indicated by gross impairment of dark-adaptation (Medical Research Council 1945). We have, however, occasionally obtained values below this level in three cases of Darier's disease. In two other patients the lowest observed values were under 50 I.U., and in three more under 60 I.U. Wide variations were usually found, however, both between patients with the same disease and between successive estimations in the same subject. Thus case 7, with severe pityriasis rubra pilaris, gave low values for the plasma-vitamin-A level. His mother, however, who had the same disease, but in less active form at the time, gave a mean value above the average for the controls. Similarly, case 6, in contrast to the other patients with Darier's disease, never showed a low plasma-vitamin-A level. It may be significant that her lesions were unusually mild. The degree of individual variation may be illustrated by case 4, whose plasma-vitamin-A level varied on different occasions between 7 and 93 I.U. Except in case 7, we found no evidence of any lack of absorption of vitamin A from the intestines, as indicated by its increase in the plasma after the ingestion of massive doses.

Our observation that the plasma-vitamin-A level is often low, but sometimes normal, in the diseases in question may explain the diversity of opinion of previous workers on this point. Factors which might be expected to cause variations between different subjects are the severity of the disease and the degree of injury to the liver. In individual subjects the extent of the skin lesions may often be subject to intermittent exacerbations and remissions, which may depend on factors such as season, diet, and endocrine activity, and may well be accompanied by corresponding changes in the plasma-vitamin-A level.

Finally two points may be emphasised. First, it must not be assumed that, if vitamin-A deficiency is of little importance in this country as a cause of the commoner skin diseases, the same conclusion can necessarily be applied to all other vitamins. The possible significance of vitamin C, for example, remains an open problem. Secondly, it must be understood that, when massive doses of vitamin A are given, of the order of 200,000 I.U., compared with the minimal curative dose of 1250 I.U. (Medical Research Council 1945), the vitamin is temporarily carried in the plasma in amounts greatly in excess of the normal physiological level. This "supercharging," in which the rate of intake of the vitamin outstrips the power of the liver to absorb the excess from the plasma, may well lead to the appearance of the vitamin in tissues from which it is usually absent, or from which it has been excluded by the disease. Massive dosing with vitamin A, therefore, may in some circumstances have therapeutical effects not conferred by mere dietary sufficiency.

SUMMARY

In an examination of plasma-vitamin-A levels in patients with miscellaneous skin diseases, no support was found for the theory that vitamin-A deficiency is of general significance in common types of skin disease in this country. The mean of 116 I.U. per 100 ml. found in 116 dermatological cases was virtually identical with the mean of 113 I.U. found in 116 controls.

Limited support was found for the theory that secondary deficiency of vitamin A may be of some significance in certain rare skin disease. In 11 cases of Darier's disease, pityriasis rubra pilaris, or ichthyosis the mean plasma-vitamin-A level was 77 I.U. Most of the patients gave very low values at one time or another, but there were some exceptions Irregularity of the plasma-vitamin-A level in individual subjects, possibly caused by periodical exacerbations and remissions in the disease, may explain the diversity of opinion among previous workers about the reality of the fall in plasma-vitamin-A level.

In all patients with Darier's disease or pityriasis rubra pilaris given massive doses of vitamin-A concentrate the plasma-vitamin-A level rose eventually to values much above normal. In one case of pityriasis, however, the plasma-vitamin-A level did not respond until dosing had been continued daily for over two months. The possibility of interference in vitamin-A metabolism through impairment of liver function in these diseases must be borne in mind.

In two cases of Darier's disease the skin became normal, or almost normal, after treatment with vitamin A and Grenz rays. Other cases of Darier's disease showed less improvement, and in one patient the lesions were unchanged even though the plasma-vitamin-A level rose very high. Two cases of pityriasis rubra pilaris improved but remained abnormal.

Our thanks are due to Dr. H. W. Barber, Dr. G. B. Mitchell-Heggs, Dr. E. W. Prosser Thomas, Mr. A. Dickson Wright, and Mr. G. H. C. Ovens for access to patients under their care, to Dr. L. J. Harris for his valuable criticism, and to Miss A. C. Cooper for technical assistance. We are indebted to Dr. A. N. Macbeth, of Organon Laboratories, for generous supplies of vitamin-A concentrate.

REFERENCES

Abramowitz, W. E. (1942) *Arch. Derm. Syph., Chicago*, **45**, 976.
Arguello, R. A. (1940) *Rev. argent. Dermatosif.* 24, 549.
Aykroyd, W. R., Rajagopal, K. (1936) *Indian J. med. Res.* **24**, 419.
— Krishnan, B. G. (1937) *Ibid*, 24, 707.
Brawasser, N. C. (1941) *Arch. Derm. Syph., Chicago*, **44**, 961.

Continued at foot of next column

References continued

Bloch, C. E. (1921) *J. Hyg., Camb.* 19, 283.
Brunsting, L. A., Sheard, C. (1941) *Arch. Derm. Syph., Chicago*, 43, 42.
Cannon, B. A. (1941) *Ibid*, **44**, 1163.
Carleton, A., Steven, D. M. (1943) *Ibid*, 48, 143.
Cornbleet, T., Popper, H., Steigmann, F. (1944) *Ibid*, **49**, 103.
Czibor, P. (1940) *Orvostud. Közl.* **1**, 247.
Frazier, C. N., Hu, C. K. (1931) *Arch. intern. Med.* **48**, 507.
Glazebrook, A. J., Tomaszewski, W. (1944) *Arch. Derm. Syph., Chicago*, 50, 85.
Goodwin, G. P. (1934) *Brit. med. J.* ii, 113.
de Gouvêa, H. (1883) *v. Graefes Arch. Ophthal.* 29, 167.
Gross, P. (1941) *Arch. Derm. Syph., Chicago*, **44**, 1060.
Kimble, M. S. (1939) *J. Lab. clin. Med.* **24**, 1055.
Lehman, E., Rapaport, H. G. (1940) *J. Amer. med. Ass.* **114**, 386.
Leitner, Z. A. (1945) *Proc. R. Soc. Med.* 38, 341.
— (1946) *Brit. J. Derm. Syph.* 58, 11.
Loewenthal, L. J. A. (1933) *Arch. Derm. Syph., Chicago*, 28, 700.
Mackay, H. M. M. (1934) *Arch. Dis. Childh.* 9, 133.
Marchionini, A., Patel, C. (1937) *Arch. Derm. Syph., Wien*, **175**, 419.
Medical Research Council (1945) see *Nature, Lond.* **156**, 11.
Michelson, H. E. (1942) *Arch. Derm. Syph., Chicago*, **45**, 628.
Moore, D. F. (1940) *J. trop. Med. (Hyg.)*, 43, 190.
Moore, T. (1946) *Brit. J. Derm. Syph.* 58, 17.
Mori, M. (1904) *Jb. Kinderheilk.* 59, 175.
Nicholls, L. (1933) *Indian Med. Gaz.* 68, 681.
Peck, S. M., Chargin, L. (1941) *Arch. Derm. Syph., Chicago*, **44**, 722.
— — Sobotka, H. (1941) *Ibid*, 43, 223.
— Glick, A. W., Chargin, L. (1943) *Ibid*, 48, 32.
— — Sobotka, H., Chargin, L. (1943) *Ibid*, p. 17.
Pettler, M. F. (1936) *Penn. med. J.* 39, 864.
— (1942) *Ibid*, **45**, 604.
Pillat, A. (1929) *Arch. Ophthal., N.Y.* **2**, 256.
Porter, A., Godding, E. W. (1945a) *Brit. med. J.* i, 840.
— — (1945b) *Brit. J. Derm. Syph.* 57, 197.
Rao, M. V. R. (1937) *Indian J. med. Res* 24, 727; **25**, 39.
Rapaport, H. G., Herman, H., Lehman, E. (1942) *J. Pediat.* **21**, 733.
Sant'Agnese, P. A. di, Larkin, V. deP. (1943) *Proc. Soc. exp. Biol., N.Y.* **52**, 343.
Schneider, E., Widder, M. (1938) *Arch. Derm. Syph., Wien*, **178**, 168.
Spector, S, McKhann, C. F., Meserve, E. R. (1943) *Amer. J. Dis. Child.* 66, 376.
Stannus, H. S. (1945) *Proc. R. Soc. Med.* 38, 337.
Sweitzer, S. E. (1942) *Arch. Derm. Syph, Chicago*, **45**, 628.
Thomas, E. W. P. (1943) *Proc. R. Soc. Med.* 36, 298.
Weiner, A. L., Levin, A. A. (1943) *Arch. Derm. Syph., Chicago*, 48, 288.
Wiltshire, H. (1919) *Lancet*, ii, 564.
Youmans, J. B., Corlette, M. B. (1938) *Amer. J. med. Sci.* **195**, 644.
Yudkin, S. (1941) *Biochem. J.* **35**, 551.

STABILISATION OF PENICILLIN SOLUTIONS WITH PHOSPHATE

R. J. V. PULVERTAFT
M.D. Camb., F.R.C.P.
PROFESSOR OF CLINICAL PATHOLOGY IN THE UNIVERSITY OF LONDON, AT WESTMINSTER HOSPITAL

JOHN YUDKIN
Ph.D., M.D. Camb., M.R.C.P., F.R.I.C.
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY, AT KING'S COLLEGE OF HOUSEHOLD AND SOCIAL SCIENCE

THIS paper describes the stabilising effect of phosphate on the rate of destruction of penicillin by heat. It is shown that the rate of destruction depends on the concentration of the penicillin and of the phosphate; that samples of different manufacture behave differently, both in their rate of destruction and in the effect on this of the concentration of penicillin and of phosphate; and that the effect is not due to control of pH but to a specific action of the phosphate ion.

These observations arose from experiments performed by one of us (R. J. V. P.) with the assistance of Dr. Grosevitz, of the department of bacteriology, Hebrew University, Jerusalem, at No. 16 British General Hospital. It was considered possible that penicillin might act on the medium and not on the organism directly. If penicillin combined with or changed a component of the medium essential to bacterial life, the observed antibacterial phenomena might be explained.

To investigate this possibility, penicillin was dissolved in distilled water and in culture media of the same pH. On autoclaving for various periods, complete destruction was observed with water, whereas residual antibacterial activity persisted with broth, a result which gave some support to the hypothesis.

A semi-synthetic medium was then obtained from Dr. Grosevitz; it contained casein hydrolysate, tryptophane, nicotinic acid, aneurine, NaCl, $MgSO_4$, $FeSO_4$, and Sørensen's phosphate buffer. Penicillin, dissolved

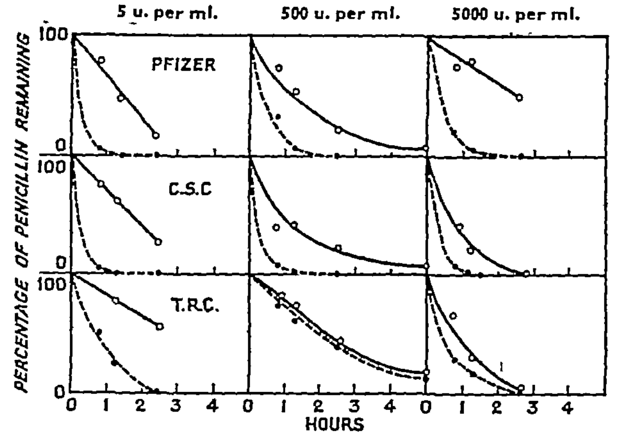


Fig. 1—Rate of destruction of penicillin at 100° C : solid line, in phosphate M/15 ; broken line, in water. Each point represents the average result of at least three experiments.

in this medium and autoclaved, maintained some of its antibacterial properties.

Each component was then tested separately ; destruction of penicillin was complete with each, except the phosphate buffer and possibly aneurine. These results were further studied by us. The results with aneurine were not confirmed. On the other hand, the stability of penicillin in the presence of phosphate was confirmed.

METHOD

Three samples of penicillin were tested : (1) Pfizer manufacture, 750 units per mg. ; (2) C.S.C. manufacture, 300 units per mg. ; and (3) T.R.C. manufacture, 45 units per mg. These products therefore contained different amounts of unknown impurities ; in sample (3) these included a fair amount of buffering agents. There is no proof that the antibacterial agents in the three products were identical.

Titration of penicillin activity was performed by the technique of doubling dilutions in the following medium :

Peptone (Evans Sons Lescher and Webb)	2·0%
NaCl	0·8%
Glucose	2·0%
Andraade's indicator	

Adjusted to pH 7·6

The doubling dilution was carried out in ten or twelve tubes, which were then inoculated with one drop of a saline suspension of *Staph. aureus* (Oxford). The suspension was of an 18-hour agar-slope culture. The end-point was taken as the first tube in which growth took place and turned the indicator red. The age of the culture and the exact composition of the medium are most important for obtaining reproducible results. Titrations by this technique were frequently checked by the *plate-ring method*.

Tests on the effect of heat were all carried out at pH 7·0, either in Sørensen's phosphate buffer mixture or in distilled water. The pH of even freshly distilled water varies considerably ; it is usually acid, but different samples for use in making up penicillin solutions, taken from different laboratories, had pH values varying from 5·5 to 9·5. All samples used in the experiments described below were adjusted to pH 7·0 after a short period of boiling.

Most of the experiments were carried out at 100° C in a constant-level water-bath. In certain tests phenol red was added as an indicator to detect changes in pH. The pH remained constant with all buffered solutions, including the most dilute ; with distilled water the pH sometimes rose slightly but never more than 0·2 unit. The solutions were always heated in containers of non-soluble glass.

RESULTS

Destruction of Penicillin at 100° C in Water and in Phosphate.—A buffer concentration of *M*/15 was arbitrarily selected for these experiments. The rate of destruction of solutions of penicillin of different concentrations is shown in fig. 1. It will be seen that, in distilled water, the rate of destruction depended on the sample *of penicillin and on its concentration. The Pfizer* sample was slightly more stable at higher concentrations, the C.S.C. sample equally stable at all concentrations, and the T.R.C. sample much more stable at intermediate concentrations.

In phosphate solutions all samples and all concentrations showed increased stability, the degree of destruction again depending on the sample and its concentration. At 5 units per ml. the T.R.C. sample was most stabilised, and the Pfizer and C.S.C. samples were less so and equally. At 5000 units per ml. the Pfizer sample was most stabilised, and the C.S.C. and T.R.C. samples were less so and equally.

Effect on Stability at 100° C of Various Concentrations of Phosphate.—The results, summarised in fig. 2, show that, though the pH was 7·0 in all instances, the effect of variations in the concentrations of phosphate differed considerably with the different samples. In the Pfizer and T.R.C. samples there was an optimal concentration, above and below which there was greater destruction of penicillin. In the C.S.C. sample the optimal concentration was not reached, all concentrations below the highest tested showing greater destruction. The optimal concentration of phosphate for each sample was as follows :

Sample	*5 u./ml.*	*5000 u./ml.*
Pfizer	*M*/13	*M*/30
C.S.C.	>*M*/3	>*M*/3
T.R.C.	*M*/100	*M*/100

Experiments with other salts showed that the effect was not produced with any of the following ions: K, Na, Mg, SO_4, Cl. The stabilisation by phosphates, therefore, is not due to its control of the pH and is a specific action of the PO_4 ion. The stabilisation originally

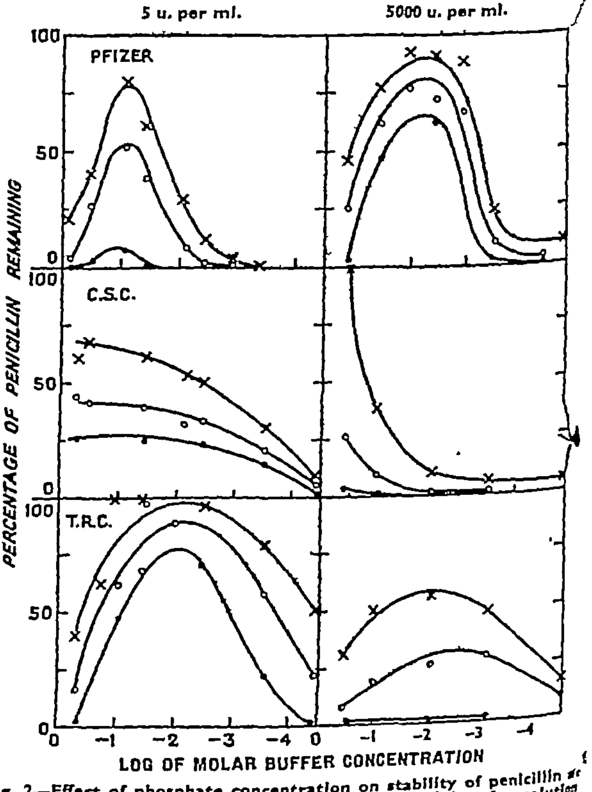


Fig. 2—Effect of phosphate concentration on stability of penicillin at 100° C. Curves represent amount of penicillin remaining after solution has been kept at 100° C for different times : X, 50 min. ; O, 75 min. ; ●, 150 min. Each point represents the average result of at least three experiments.

served with culture media is probably to be explained the phosphates contained in them.

Other Results.—(1) It has been suggested that *glucose* creases the rate of destruction of penicillin in solution. his would be surprising, since glucose solutions are ightly acid, and penicillin is more stable in acid solu-ons. Experiment confirmed this supposition; peni-llin in 5% glucose, with a pH of about 5·0, was slightly ore stable than the same solution with the pH adjusted 7·0 with soda. With phosphate buffer at pH 7·0 the ate of destruction was greatly reduced; the rate of estruction at pH 7·0, in the presence or absence of hosphate, was the same in these experiments as in hose without the addition of glucose. Glucose as such therefore without effect on penicillin.

(2) Certain samples of synthetic *rubber* destroy peni-illin. It was found in one experiment that, at 37° C, 0% was destroyed in water after three days, whereas nly 30% was destroyed in the presence of *M*/15 phos-hate. This preservation, however, did not always take lace. For example, if the rubber tube was cut into mall pieces, thereby greatly increasing the surface of ubber in contact with the penicillin, no preservation was observed.

(3) At 37° C the rate of destruction of penicillin is very slow. Nevertheless, it was possible to show, in dilute solutions, an increase of stability in the presence of phosphate, though it was not so great as at 100° C.

DESTRUCTION OF PENICILLIN AT 100° C IN PHOSPHATE AND IN WATER (% DESTROYED AFTER 10 MINUTES, BY INTRA-POLATION FROM FIG. 1)

Sample	5 u./ml.		500 u./ml.		5000 u./ml.	
	Water	Buffer	Water	Buffer	Water	Buffer
Pfizer ..	35	5	25	5	30	3
C.S.C. ..	40	3	50	15	40	10
T.R.C...	15	3	5	5	15	5

PRACTICAL APPLICATIONS

The stability of samples of penicillin as now manufactured is much higher than previously thought, and even at 37° C destruction is comparatively slow. Nevertheless, the addition of phosphate, especially to dilute solutions such as are used for local application, makes it possible to preserve the potency of the penicillin for long periods at room temperature—i.e., without having to keep the solution in the refrigerator.

The fact that phosphate reduces the rate of destruction of penicillin by rubber may also be of some practical value. Penicillin solutions may be in contact with rubber for a considerable period in apparatus used for continuous parenteral administration, and the addition of phosphate may decrease the loss of activity of the penicillin.

In our view, however, the most important application of our findings is the possibility of sterilising solutions of penicillin with minimal loss of activity. Certain organisms, notably *Ps. pyocyanea*, are apt to grow in solutions of penicillin kept for a short time, even in the refrigerator. We have carried out tests which show that it is possible completely to sterilise solutions of penicillin, heavily infected with *Ps. pyocyanea*, by boiling for ten minutes. By intrapolation from fig. 1, it can be shown that, in this time, there is only very slight loss of activity if phosphate is present (see table).

SUMMARY

Phosphate stabilises penicillin solutions at 100° C to a considerable extent.

The degree of stabilisation and the optimal concentration of phosphate depend on the sample of penicillin. They do not depend on the amount but presumably on the nature of the impurities present in these samples.

It is possible to sterilise solutions of penicillin by boiling in the presence of phosphate, with only very small loss of activity.

Phosphate appears to decrease the rate of destruction of penicillin by some samples of synthetic rubber.

A SYNDROME SIMULATING ACUTE ABDOMINAL DISEASE

B. W. Goldstone
M.B., B.Sc. Lond., F.R.C.S.E.
LATE MAJOR R.A.M.C.

H. S. Le Marquand
M.D. Lond., F.R.C.P.
PHYSICIAN TO THE ROYAL BERKSHIRE HOSPITAL, READING;
LATE MAJOR R.A.M.C.

The purpose of this article is to describe a series of cases which at first appeared to be acute abdominal conditions. The patients were European Servicemen in a military hospital in West Africa. Careful clinical analysis of the first few cases showed that the signs did not correspond to those of the usual abdominal emergencies. Without surgical interference the illness almost always subsided. We soon learned to recognise the features of what we think is a new syndrome, and spontaneous improvement in some cases justified the diagnosis. The cases were investigated, and the results are tabulated below. Some of the more illustrative cases are described in detail.

TYPICAL CASE-RECORDS

Case 1.—Male, aged 20. This was the first case of the series. He was sent into hospital with a diagnosis of acute cholecystitis. He had severe pain in the right upper abdomen and the right shoulder, which came on in the course of a few hours. Rigidity and tenderness were present in the right upper abdomen; the rigidity was extreme, the tenderness only moderate. The temperature was 100° F, the pulse-rate 80 per min., and the respirations were 20 per min. No other physical signs were found.

The diagnosis rested between perforated peptic ulcer and pleuropneumonia. The gradual onset and the pyrexia did not support the former diagnosis, and there were no signs of the latter. We felt justified in waiting a few hours, and by then a remarkable improvement had occurred; pain, pyrexia, and physical signs were rapidly subsiding. Twenty-four hours after admission his condition was almost normal. On the 3rd day he had a slight recurrence of pyrexia, which subsided in 24 hours. Radiography in the early stages showed normal lung fields, but the right diaphragm moved less than the left; the gall-bladder was radiologically normal. No malarial parasites were found in the blood.

Case 2.—Male, aged 35, sent into hospital with a diagnosis of perforated duodenal ulcer. Several hours previously he had been gradually overcome by very severe pain in the right upper abdomen, the right side of the neck, and the right shoulder. The pain was still present on admission, with great pain, rigidity, and tenderness in the right upper abdomen. Immediate radiography showed normal lung fields, but the respiratory excursion was limited on the right side. Considerable hyperalgesia to pinprick was present over the right subcostal region, the right side of the neck, and the right shoulder. Within 10 hours he had so much improved that there was now no question of an acute abdominal emergency, and within 2 days he had recovered. Undoubtedly we would have operated on this man if we had not previously seen case 1, because the resemblance to a case of perforated ulcer was striking. However, immediate radiography had shown no sign of gas beneath the diaphragm.

Case 4.—Male, aged 19, rescued unconscious from a swimming-bath and sent to hospital as half-drowned. Two days previously he had complained of pain radiating up the chest on both sides of the sternum. This had been severe enough to keep him awake, but his medical officer could find nothing abnormal in the chest. Two days later he felt well enough to bathe. In the water he became unconscious and after his rescue artificial respiration was given because he was thought to be half-drowned. As he recovered he repeatedly clutched at his abdomen as though in great pain, and it was noted that generalised abdominal rigidity and tenderness were present. In hospital shortly afterwards he showed considerable general abdominal rigidity and moderate tenderness, most marked over the whole of the right side of the abdomen, but especially in the right upper quadrant. The temperature was 98° F, the pulse-rate 82 per min., and the respirations 24 per min. There were no other physical signs, except restricted chest movement.

The diagnosis of perforation was so strongly suggested that it was only after very careful consideration that we decided to watch his progress. During the next 10 hours he improved so rapidly that he was able to sit up and read, and the physical signs regressed correspondingly. The temperature was now 99° F, the pulse-rate 72 per min., and the respirations 18 per min. Convalescence was uneventful. Investigation showed a white-cell count of 10,000 per c.mm.: 75% polymorphs. The cerebrospinal fluid was normal. Radiography of the chest was normal.

CASE 11.—Male, aged 32, sent in with a diagnosis of perforated duodenal ulcer. For several months previously he had suffered from boils, and for several years there had been occasional pain in the right iliac fossa, suggesting chronic appendicitis. For 19 hours before admission he had gradually increasing pain to the right of the umbilicus. On admission the temperature was 99° F, the pulse-rate 100 per min., and the respirations 20 per min. Severe pain and almost board-like rigidity, with moderate tenderness, were present over the whole of the right abdomen and flank. There was no hyperalgesia, and liver dullness was normal.

We thought that this case was identical with the others of the series. Three hours later the pain was less, and the patient was asleep; but the temperature had risen to 102·6° F, and rigidity and tenderness were present only in the right iliac fossa. In view of the history suggesting chronic appendicitis, exploration was considered essential. Operation revealed no adequate cause for the severe abdominal symptoms. The appendix was removed. It lay in the pelvis and showed chronic fibrosis, with no sign of acute inflammation. Seven hours after the operation the temperature was 99·4° F, the pulse-rate 88, and respirations 20 per min. There was hardly any abdominal pain. The white-cell count was 17,500 per c.mm.: 78% polymorphs. Recovery was uneventful, except for pyrexia and slight right upper abdominal pain, lasting a few hours on the 2nd and 5th days after the operation.

FEATURES OF THE SYNDROME

(1) Gradual onset of symptoms, rising to a peak in a few hours. (2) Pain in the right upper abdominal quadrant, sometimes spreading to the whole of the right side of the abdomen and loin. (3) Considerable rigidity with relatively less tenderness in the same areas

Case	Age (yr.)	Diagnosis before admission	Symptoms before and on admission	Signs and symptoms on admission	Results of investigations*	Progress
1†	20	Acute cholecystitis	Pain developed in 6 hr. in rt hypochondrium and rt shoulder	T. 100° F, P. 80, R. 20, extreme rigidity in rt upper abdominal quadrant	Cholecystogram normal	Signs and symptoms almost disappeared in a few hours, and recovery in 5 days
2†	35	Perforated duodenal ulcer	Severe pain in rt side of abdomen and rt shoulder developed in 7 hr.	Rigidity and tenderness in rt upper abdominal quadrant; rt shoulder very painful	Sputum normal	Rapid improvement in 10 hr. and recovery in 8 days
3†	25	No diagnosis	Severe pain in rt chest radiating to rt shoulder and then to rt upper abdominal quadrant	T. 99° F, P. 88, tenderness in rt upper abdominal quadrant	..	Recovery in 5 days
4†	19	Half-drowned	2 days' pain in lower chest, sudden onset of severe general abdominal pain	T. 98° F, P. 82, R. 24, rigidity and tenderness in rt upper abdominal quadrant	Cerebrospinal fluid normal, white-cell count 10,000 per c.mm. No pathogenic organisms in stools	Improved in 5 hr. Recovered in 6 days
5	29	Malaria or chest condition	No history of boils; 9 hr. pain in rt lower ribs and upper abdomen	T. 101° F, P. 98, R. 28, tenderness and rigidity in rt upper abdominal quadrant	..	Recovery in 48 hr.
6	39	? Gastric ulcer	Boils for 9 weeks. Previous similar abdominal attack a few weeks before. Pain for 48 hr.	T. 98·4° F, rigidity of rt upper abdominal quadrant	..	Rapid recovery in 9 hr.
7	40	Acute perforated appendix	48 hr. malaise, 6 hr. epigastric pain, no boils	T. 102·8° F, P. 104, rigidity and tenderness of rt upper abdominal quadrant	..	Improved in 12 hr. Relapsed on 5th day. Recovery in 7 days
8	26	? Hepatitis	Boils for a few weeks, 15 hr. pain in rt upper abdomen and in back	T. 101° F, P. 90, boils over sacrum, rigidity and tenderness in rt upper abdominal quadrant	Hæmolytic *Staph. aureus* grown from pus	At first improved, later rt perinephric abscess evacuated
9	25	? Pleurisy ? Cholecystitis	No boils, 30 hr. abdominal pain becoming localised in rt upper quadrant	T. 100° F, P. 80, rigidity, tenderness, and hyperalgesia in rt upper abdominal quadrant	Cholecystogram normal, no pathogenic organisms found in fæces	Later had transient pain in shoulder and chest and pain in loin. Recovery in 4 days
10	21	No diagnosis	No boils, 9 days' pain in rt upper abdominal quadrant with pyrexia	T. 101° F, P. 90, rigidity and tenderness in rt upper abdominal quadrant	White-cell count 12,300 per c.mm. (polymorphs 74%), cholecystogram and fæces normal	Rigidity and tenderness moved to rt loin. Recovery in 6 days
11	32	Perforated duodenal ulcer	19 hr. abdominal pain, recent boils	T. 99° F, P. 100, R. 20, board-like rigidity and tenderness in rt upper abdomen and flank	White-cell count 17,000 per c.mm. (polymorphs 78%), cholecystogram and fæces normal	3 hr. later T. 102·6° F, nothing abnormal found at operation, uneventful recovery
13	..	Perforated duodenal ulcer	Sudden onset of severe abdominal pain (the only case in which the onset was sudden), bilateral meatal furunculosis	T. 96·8° F, P. 80, board-like rigidity and moderate tenderness in rt upper abdominal quadrant	Cholecystogram and fæces normal	Rapid recovery in 5 hr.

---

* In every case the following investigations were carried out, with the results as stated:
Urine: No abnormal constituents, culture sterile.
Radiography of chest: Lung fields normal; in some cases movement of rt diaphragm was restricted.
Blood film: No malaria parasites found in repeated examinations.

† History of boils not inquired into.

Case 12 was not included in the table as detailed notes were lost (see text) as the pain. (4) There is usually diminished movement of the right side of the chest and diaphragm, sometimes associated with shoulder pain. (5) There may be a rapid change in the symptoms and signs and particularly a change in the situation of pain and rigidity. (6) Spontaneous rapid improvement in most cases.

DIFFERENTIAL DIAGNOSIS

Acute Surgical Conditions

In our cases, when observation was justifiable, the rapid improvement excluded a surgical emergency; but when first seen a difficult problem was presented.

(1) *Perforated peptic ulcer* was excluded because the onset was gradual, often with pyrexia; liver dullness was not impaired; and subphrenic gas was not shown radiologically.

(2) *Appendicitis* was excluded because the signs were as a rule most prominent in the right upper abdominal quadrant, and the usual sequence of appendicitis symptoms—i.e., umbilical pain, nausea or vomiting, followed by pain in the right iliac fossa—was never seen.

(3) *Gall-bladder disease* and *acute pancreatitis* were excluded because these diseases are uncommon in persons of military age, there was no previous history suggesting gall-stones, and cholecystograms were subsequently negative.

Tropical Diseases

(1) *Malaria.*—In every case repeated blood examination failed to find the malarial parasite.

(2) *Amœbic hepatitis.*—The course of the illness and the failure to find amœbæ in the stools excluded this disease.

Other Medical Conditions

(1) *Acute lung disease.*—Clinical and radiological signs of chest disease were absent.

(2) Unusual *virus disease of the cord.*—Speedy recovery excluded this possibility, and the cerebrospinal fluid in case 4 showed no abnormality.

(3) *Infective hepatitis.*—Jaundice was absent and the liver was not enlarged.

DISCUSSION

Reference to cases 1, 2, 3, and 9 (see table) shows that the abdominal symptoms were accompanied by shoulder pain, and this suggests a lesion in relation to the diaphragm. Investigations excluded chest disease and all likely causes below the diaphragm, and we could not think of an explanation. At this point we saw the following case, which provided a hypothesis.

CASE 8.—Male, aged 26. On May 18 he complained of general malaise. Two days later he had right subcostal pain, and his temperature was 101·4° F. Next day he was admitted to hospital. His temperature was 101·4° F and his pulse-rate 90 per min. Right subcostal pain and tenderness were present. Corresponding rigidity was present, without hyperalgesia. There was some pain on pressure in the loin. At this stage we considered that the patient fell into the same group as the rest of the series.

On the 22nd the symptoms and signs improved, but the temperature rose to 103° F. During the next week his condition slightly improved, but pain persisted. Investigations showed a white-cell count of 21,000 per c.mm., normal urine, and sterile blood-culture. As the pyrexia continued, sulphathiazole 9 g. was given. Soon afterwards rigidity disappeared, and on June 7 a hard knobbly mass could be felt in the position of the right kidney. A diagnosis of perinephric abscess or renal carbuncle was supported by (*a*) slight scoliosis with concavity to the right; (*b*) absence of the right psoas shadow on radiography; and (*c*) defective filling of the lower calyces of the right kidney in an intravenous pyelogram.

On the 10th the right kidney was exposed by Mayo's incision. Zuckerkandl's fascia was incised, and there was a small gush of pus, which culture showed to contain a pure growth of *Staph. aureus*. This fascia and the perinephric fat were fused into a cardboard-like mass, in which a window was cut to expose the lower half of the kidney. The kidney was found to be fixed by strong adhesions into this diseased perinephric fat. The wound was sewn up with a large drain to the perinephric space. A few days after the operation discharge of pus became profuse and grew the same organism as before in pure culture. Recovery was uneventful. Histological examination of the excised tissue showed "great thickness of collagen fibres interspersed with numerous fibroblasts: there were numerous foci of small cells, with a few polymorphs suggesting multiple early abscess formation."

Clearly this was a case of staphylococcal disease of the perinephric fat. Similar cases have been described by Ryle (1936) among others. This case suggested to us the possibility that staphylococcal perinephric infection was the underlying cause in all our series, though not usually reaching the stage of abscess formation. The argument in favour of this view is as follows. Staphylococcal disease affecting the subcutaneous tissue ranges in severity from a pimple to a carbuncle. It is usually subacute, with an indolent spread, tending to resolve spontaneously. These features are reflected in our cases: sometimes there is a history of boils (cases 6, 8, 11, and 13) and usually a preliminary period of malaise which would correspond to the subacute development of the infection in the relatively silent area of the perinephric fat (cases 4, 6, 7, and 10). The range of severity of staphylococcal infection corresponds to the range shown by our series, which extends from the high temperature and long course in cases 7 and 10 to the rapid improvement of cases 3, 6, 9, and 13. Spontaneous resolution is shown by all the cases except case 8. This tendency is also well illustrated by case 12, full particulars of which cannot be included in our table because the notes were lost. The patient was seen a year before the other cases and showed a continuous swinging temperature for some weeks, with right epigastric rigidity. Later, fullness developed in the right loin, and the psoas shadow was absent on radiography. We diagnosed perinephric abscess with confidence, but 2 days before the date fixed for operation the temperature fell and recovery was spontaneous.

Suggested Explanation of the Acute Symptoms.—There is a consensus of opinion that abdominal rigidity results from a lesion of the peritoneum only. It is easy to imagine a staphylococcal lesion spreading slowly in the silent perinephric fat until the peritoneum is suddenly reached, when dramatic symptoms will develop in the course of a few hours. There is an essential difference between confirmed cases of staphylococcal perinephric abscess and the perforating lesions of appendicitis and peptic ulcer, in that perinephric abscess does not perforate into the peritoneal cavity. In fact, a perinephric abscess will rather present beneath the skin of the back. A perforating lesion gives rise to continued rigidity and tenderness while it spreads, because more and more nerve-endings are involved, but in retroperitoneal infection we have a localised area of inflammation on the posterior aspect of the peritoneum, quite unlike the spreading peritonitis of the perforative lesion. Now we can suggest a reason why the rigidity and tenderness may disappear rapidly in our cases: it is because adaptation to sensory stimuli develops quickly in the nerve-endings of this limited area of peritoneum (Adrian 1928).

The origin of shoulder pain must be discussed (cases 1, 2, 3, and 9). The upper portion of the kidney lies upon the dorsal part of the diaphragm, which is derived from the 4th cervical myotome; hence this part of the diaphragm is innervated from cervical 4, and lesions of its covering peritoneum are referred to the distribution of the supraclavicular nerves (C3 and C4). This fact is well known in surgical practice and has been confirmed by the experimental work of Capps (1932); but in case 9 the chest pain is of special interest because the site of the pain was over the 2nd right intercostal space—i.e., within the zone of the supraclavicular nerves.

We have stated why we think that this syndrome is due to perinephric staphylococcal infection, but several objections to this hypothesis are evident:

(1) Why does it develop on the right side only?

(2) Why does it develop so often in West Africa, so rarely in U.K.?

(3) Might the syndrome rather be due to an unusual type of epidemic ?

We cannot say why the right side only is affected, but the following case is pertinent.

Male, aged 38, admitted with the diagnosis of left lumbar fibrositis of 6 weeks' duration. He had dull pain and some tenderness in the left loin and back, shown at operation to be due to a large left perinephric staphylococcal abscess containing at least 1 pint of pus. There were no signs of peritoneal involvement. This suggests that left-sided perinephric infection may not give rise to the syndrome we have described.

The second query is easily answered. Staphylococcal disease is not only very prevalent and virulent in the Forces in West Africa, but also it takes unusual forms.

As for the third query: is there any evidence that these cases were an infective epidemic ? The sex and age-groups give no evidence, as the patients were members of the Forces and from widely separated units. However, it must be admitted that almost all our cases occurred from April to August, 1944.

There is one further point of interest (see case 11 in the table). Most surgeons, and this includes one of us, have at some time operated in England in full expectation of discovering an acute peptic perforation, only to be surprised by completely normal findings followed by spontaneous recovery. Are these puzzling cases examples of the syndrome described in this article ? We suggest that all such cases should be examined with this syndrome in mind.

SUMMARY

A new abdominal syndrome is described. It consists in right upper abdominal pain and rigidity with pyrexia. It comes on in a few hours and simulates in many cases a perforative lesion. Spontaneous recovery is the rule.

Of 13 cases here reported 1 eventually developed a perinephric abscess.

It is suggested that the cases which recovered spontaneously were abortive forms of perinephric staphylococcal infection. Abortive perinephric staphylococcal infection may be common in the silent perinephric fat but symptoms do not arise unless the lesion touches the peritoneum.

Cases simulating perforated peptic ulcer, but with negative operative findings, are not uncommon. They may be of the same type as those described here.

Acknowledgment is due to Lieut.-Colonel J. A. W. Segerdal, R.A.M.C., for permission to publish these cases. We wish to thank Major J. C. G. Whitelaw, R.A.M.C., pathologist, and Captain T. E. Broadbent, R.A.M.C., radiologist, for coöperation and help.

REFERENCES

Adrian, E. D. (1928) The Basis of Sensation, New York, p. 90.
Capps, J. A. Coleman, G. H. (1932) Experimental and Clinical Study of Pain, New York. Quoted from S. Wright's Applied Physiology, 8th ed., London. 1945, p. 236.
Ryle, J. A. (1936) Natural History of Disease, New York and London, p. 224.

" . . . Mr. Bevan, throughout the proceedings in committee, firmly set his face against any proposals that might tie his hands. He has asked for virtually unlimited powers, and obtained them, not because he wants to be a health dictator, as his opponents claim, but because that is the last thing he dare be. It would need an establishment far beyond anything the Ministry of Health could hope to acquire if he were to attempt to oversee the detailed running of the health services. But until they are running, or at least until the structure has been set up, no-one can tell what powers will be necessary and what can be discarded in practice. Wide powers are to be taken in order to achieve flexibility, not excessive centralisation. That, at least, seems a reasonable interpretation of this enabling Bill, which, in an entirely new field of activity for the State, possibly leaves more undefined, and introduces more ambiguities, than any comparable measure. . . . The National Health Service Bill probably sets up the best structure that could be devised for providing such a very personal service for the people. But until it is certain that it will work as Mr. Bevan intends it to work, final judgment will still have to be reserved."—*Economist*, August 3, p. 163.

SPOROTRICHOSIS RESEMBLING DIPHTHERIA

REPORT OF AN UNUSUAL CASE

H. STANLEY BANKS
M.D. Glasg., M.R.C.P., D.P.H.
MEDICAL SUPERINTENDENT, PARK HOSPITAL, L.C.C.

SPOROTRICHOSIS is a rare disease produced by a fungus of the genus sporotrichum. The tissues primarily invaded have usually been subjected to some form of trauma or devitalisation, the organism being a saprophyte with relatively feeble powers of parasitism. The site of entry is most commonly the skin of the hand; invasion of mucosa is usually secondary, but a conjunctival lesion may be primary (De Beurmann and Gougerot 1912, Welder and McCullough 1914). The type of lesion usually produced is a granuloma of the subcutaneous tissue in the form first of nodules and later of gummata, abscesses, or ulcers. These are often distributed along the course of lymphatics leading from the primary lesion. They may, however, be disseminated widely by general blood-stream infection. Where the skin is soft, as in the face, the ulcers are usually echthymiform cup-like depressions (fig. 1). Foerster (1924) refers to a typical cup-shaped ulceration of the mucosa overlying the anterior part of the nasal septum. In the mucosa of the palate, pharynx, and conjunctiva the nodular character of the lesion is usually preserved in the form of small papillomatous or gummatous vegetations or yellowish follicular spots 1–2 mm. in diameter set in a greyish yellow layer of mucopus (De Beurmann and Gougerot 1912). I can find no reference in the literature to mucosal lesions closely resembling diphtheritic membrane, and for that reason the following case is recorded.

CASE-RECORD

A female infant, aged 11 months, was admitted to Park Hospital on Feb. 28, 1944, certified as having nasal diphtheria. She had been ailing four weeks, the symptoms being nasal discharge, nausea, recurrent vomiting, and cough. The cough had become croupy a week before admission.

On admission the child was apyrexial and not particularly toxic. The fauces showed superficial ulceration, with thin membranous exudate covering the uvula and a small area of fauces and palate on each side of it. There was neither œdema nor redness round this lesion. The submaxillary glands were palpable, but there was no circumglandular œdema. The anterior nares and a small adjoining part of the upper lip were excoriated. There was a thin bloodstained nasal discharge but no definite membrane in the nares. The distinctive presenting sign was in the left eye: a thin soft yellowish sheet of membranous exudate, with well-defined margins, lining the whole of the palpebral conjunctiva of the lower lid. Beyond the margin of this membrane the fornix of the conjunctiva was red and œdematous. The cornea was slightly hazy. The right eye showed a somewhat similar condition, but the exudate on the palpebral conjunctiva was thin, flimsy, and less extensive. The voice was hoarse.

Clinically, the case appeared to be one of anterior nasal, uvular, ocular, and possibly laryngeal diphtheria. Swabs were taken from the three available sites, and it was noted that the membrane did not wipe off from the uvula and conjunctivæ, nor did it bleed. Diphtheria antitoxin 60,000 units was injected intravenously. The eyes were irrigated with saline and 20% 'Argyrol' instilled. All three swabs were reported next day to be negative for *Corynebacterium diphtheriæ* and to give a profuse growth of hæmolytic streptococcus. The swabs were repeated on the 29th with the same result, except that, on this one occasion, virulent *C. diphtheriæ* of gravis type was grown from the nose (probably a secondary infection picked up in the ward). Because of the hæmolytic streptococci the child was given sulphathiazole 0·5 g. four-hourly.

On March 1 the membrane in the fauces had spread considerably over both sides of the soft palate, uvula, and fauces, but without surrounding œdema or redness and without fœtor. It was firmly adherent but could be broken up on forcible swabbing without bleeding. The conjunctivæ in both yes, but particularly the left, were very red and swollen and howed shreds and patches of greyish yellow exudate but not now a continuous sheet of membrane. The nares were more xtensively ulcerated and exuded hæmorrhagic discharge. A swab from the palatal membrane on this day was negative or *C. diphtheriæ*, Vincent's organisms, and fungus in smears, but gave a good growth of hæmolytic streptococcus type 25.

On the 3rd the membrane covered the whole of the soft palate, still without surrounding redness or œdema, and without periadenitis. In both eyes there was now a brown-stained pellicle over the cornea. Although by this time there was much evidence against a diagnosis of diphtheria, for safety additional diphtheria antitoxin 60,000 units was given intravenously, and sulphathiazole was continued in the same dosage.

On the 4th the eyes were seen by Mr. M. Shaw, who reported "central bilateral corneal ulceration, extensive in the left eye; severe ulceration of palpebral surfaces of eyelids; conjunctivæ and eyelids œdematous." A blood-count showed white cells 13,000 per c.mm. (polymorphs 66%, eosinophils 0·5%, basophils 0·5%, lymphocytes 25·5%, monocytes 7·5%).

On the 6th the membrane in the throat extended over most of the palate, fauces, uvula, and posterior pharyngeal wall as far as could be seen. There was a hoarse cough, with occasional slight stridor on inspiration, but no recession of the chest wall. The membrane had been completely washed off the eyes, leaving corneal ulceration and opacity and severe conjunctival congestion. A throat swab and smear on this day showed no *C. diphtheriæ*, Vincent's organisms, or fungus, but only a pure growth of hæmolytic streptococci. A culture was put up for fungus. The hæmolytic streptococcus type 25 previously isolated was reported to be partially resistant to sulphanilamide but sensitive to sulphathiazole.

On the 9th the membrane in the throat and pharynx was still as extensive as ever and still without accompanying œdema. The ulceration of nares and upper lip was more extensive. The eyes exuded sticky seropurulent discharge, and there were an extensive left and a smaller right corneal opacity. There were stridor and slight recession at times. A new feature present was a small area of ulceration of the right auditory meatus and pinna, with seropurulent discharge (fig. 1).

On the 13th sulphathiazole treatment was changed to sulphadiazine 0·5 g. four-hourly. On the 15th the culture for fungus, set up on the 6th, was reported to have grown *Sporotrichum schencki* (fig. 2). Sulphonamide medication was stopped, and pot. iod. gr. $1^1/_2$ four-hourly substituted. The mucosa of mouth and throat was painted with Mandl's paint. The temperature, which had been practically normal throughout, now began to rise slightly.

On the 17th a large piece of the palatal membrane was examined for sporotrichum spores or mycelia in direct smear, with a negative result. Mr. Shaw reported a sloughing left cornea, and on the 18th removed the left eye. After the operation the child's condition deteriorated. By the 21st the temperature, which had been practically normal throughout, had risen to 103° F. There was still membrane on the buccal mucosa, gums, fauces, and palate; and the left eye socket showed a thick hard nodular mass in the conjunctiva of the upper lid. The child was coughing up bloodstained mucopus; and the *tips of the thumbs and circumanal region* showed superficial ulceration similar to that on the ear, nares, and upper lip. The child died on the 24th.

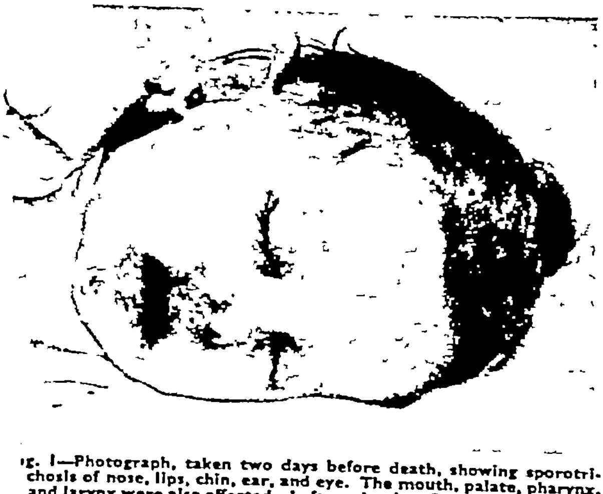


Fig. 1—Photograph, taken two days before death, showing sporotrichosis of nose, lips, chin, ear, and eye. The mouth, palate, pharynx, and larynx were also affected. Left eye has been surgically removed.

Necropsy (Dr. E. M. Young).—The *œsophagus* was covered with sticky mucopus, but there was no ulceration of the wall. *Mouth:* dense adherent membrane covered both tonsils, soft palate, and epiglottis. *Larynx:* aryepiglottic folds roughened but no ulceration. *Trachea:* purulent discharge but no ulceration. *Pleura:* no pleural fluid, no adhesions. *Lungs:* no consolidation; bronchi contained frothy mucopurulent secretion. *Heart* dilated on right side; slight excess of clear yellow fluid in pericardium. *Intestine* normal. *Liver:* a few areas of fatty degeneration. *Gall-bladder, kidneys,* and *suprarenals* normal. *Brain:* congestion and œdema but no gross lesion. *Middle ears:* both contained purulent material and necrotic bone. Culture from the exudate in the mouth gave a growth of *Sp. schencki* and of hæmolytic streptococci. Cause of death: sporotrichosis of mouth, pharynx, larynx, ear, and eyes; toxæmia.

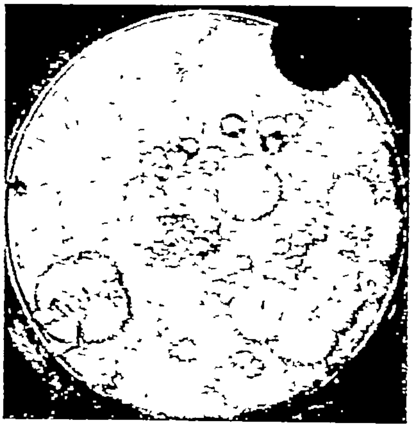


Fig. 2—Primary culture from swab of membrane on palate on 10th day after admission, showing *Sporotrichum schencki* (larger colonies) and *Monilia albicans* (smaller colonies) on Sabouraud's medium.

The left cornea removed at operation showed no distinctive histological features. The epithelial covering was denuded, and an inflammatory exudate was present, consisting largely of polymorphs, red blood-cells, and fibroblasts. In one part there was a well-marked new formation of granulation tissue. The posterior elastic lamina was not involved.

DISCUSSION

According to Jacobson (1932) sporotrichosis was first recognised by Link in 1809 and later by Montague in 1844. Schenck (1898) successfully isolated the fungus and was the first to describe sporotrichosis in the United States. De Beurmann and Ramond (1903) were the first to recognise the disease in France. Most of our knowledge of the disease is owed to De Beurmann and Gougerot (1912), whose monograph in two volumes still remains the monumental work on the subject. They describe two parasitic sporotricha but admit that these exhibit considerable pleomorphism, and that they may be merely different varieties of one parasite.

According to their description, *Sp. schencki*, on Sabouraud's medium, grows as white colonies with little tendency to pigmentation and presents a rough mountainous aspect with radiating furrows from centre to periphery; spores are few. It is the common variety in the United States. *Sp. beurmanni* commonly grows as brownish or even chocolate colonies but sometimes remains white for some days. The surface aspect is one of fine whorls irregularly crossed by crests and furrows; the spores are massed in large numbers. It is the common variety in France. There is a general tendency in recent literature to classify all parasitic sporotricha as *Sp. schencki* in honour of the discoverer. On culture, growth does not become visible for at least four days. By the eighth day the colony is about 1 cm. in diameter, and by the 24th day it may be 4 cm. or more in diameter, with a pigmented centre. Microscopically, the mycelia appear as hyaline fine branching organisms 1–2 μ in diameter. The spores are oval or oat-shaped and are attached to short lateral branches or longer hyphæ.

The fungus has been found on many types of vegetation, living, dead, and decayed—e.g., leaves, bark, barberry bush, sphagnum moss—on the fur, skin, or lesions of the natural disease in domestic and laboratory animals—e.g., cat, rat, and rabbit—and on insects—e.g., flies, wasps, and ants. It grows readily at ordinary temperature on various culture media in the open air and is resistant to sunlight. Even contaminated soil is thus a possible source of infection. Most of the human patients have been infected, from live or dead vegetation, on the site of an injury of skin or mucosa—e.g., the prick of a barberry thorn, the bite of an animal, or the sting of an insect.

Sporotrichosis is mainly a disease of adults, particularly of agricultural manual workers and housewives. In the United States 206 cases had been reported up to January, 1940, the chief occupations of the victims being, in order of frequency, farmers, gardeners, and nurserymen, housewives, industrial workers, and general labourers (Gastineau et al 1941). Most of the reported cases have been in the Mississippi and Missouri valleys of the United States and in France. The fungus, however, is known to be widespread and found in every country. In Britain 9 cases had been reported up to the year 1932 (Gray and Bamber 1932).

The disease is usually chronic. The organism can remain a saprophyte in man and invade the tissues long after inoculation. Similarly, it can persist (in the pharynx and larynx at least) several months after healing of the lesions (De Beurmann and Gougerot 1912). Prognosis in the common cutaneous lymphatic variety is good, but is grave in all mucosal lesions. Treatment with iodides is generally effective, at least in the cutaneous variety. Iodides should be given up to the limit of toleration—e.g., gr. 30–75 daily for three weeks and continued in reduced dosage for at least three months, or for six weeks after visible healing of the lesions.

The case described was of a very unusual type. Its presenting features on admission to hospital included superficial ulceration of the anterior nares, superficial ulceration and thin membranous exudate on the uvula and adjacent parts of the soft palate, and thin membranous exudate lining the whole of the palpebral conjunctiva of the left lower eyelid. The last-named lesion bore an exceedingly close resemblance to that of ocular diphtheria as previously seen by me. The absence of the typical discrete papillomatous lesions of sporotrichosis, both on the conjunctiva and on the palate and fauces, was as remarkable a feature of this case as was the presence of false membrane in the eye and palate. The only lesion which developed according to type was the cup-shaped ulceration spreading from the anterior nasal septum to the lips and side of the face. The membrane on the palate looked like the false membrane of diphtheria for days, but the absence of surrounding œdema and of periadenitis, after the membrane had grown all over the palate, made a diagnosis of diphtheria after a few days most unlikely. This was confirmed by the many negative reports on swabs from eye, nose, and throat. The one swab positive for *C. diphtheriæ*, obtained from the nose twenty-four hours after admission to the ward, was almost certainly a ward contamination, since this finding was not confirmed by earlier or later swabs, the clinical course, or the necropsy. The pathological work made it clear that the case was one of sporotrichosis complicated by a persistent infection with type-25 hæmolytic streptococcus. Whether the streptococcal infection was a factor in modifying the clinical picture or not is a matter of speculation.

The diagnosis of sporotrichosis in the absence of a typical clinical picture usually involves delay, since the organism is not commonly seen in direct smears, and the result of a culture cannot be known for five days or more. A serum test for antibody may be tried, if a suspension of sporotricha is available as an antigen. For a positive result the titre should be high, since actinomycosis may also give a positive result in low dilutions. A dilution of 1 : 800 is suggested as a typical positive result (Foerster 1924, Gaucher 1910). In the present case the diagnosis was made by culture on the sixteenth day after admission to hospital.

Treatment with potassium iodide in this case was without effect. De Beurmann and Gougerot (1912) emphasise the grave prognosis of pharyngeal sporotrichosis in contrast to that of the cutaneous lymphatic type. Surgical treatment should be avoided as far as possible. French (1941) mentions a case in a man, aged 42, who died after amputation of the hip-joint, having had the disease for 39 years. In the present case, although the prognosis was always desperate, there was no deterioration after the removal of the eye.

SUMMARY

A brief account of the rare disease sporotrichosis is given.

A case of pharyngeal, ocular, and nasal sporotrichosis is described which was unusual in closely resembling diphtheria on first examination.

My thanks are due to Dr. E. M. Young, assistant pathologist, Southern Group Laboratory, Park Hospital; Mr. M. Shaw, ophthalmologist; and Dr. L. J. M. Laurent.

REFERENCES

De Beurmann, C. L., Gougerot, H. (1912) Les Sporotrichoses, Paris, vol. II, p. 316.
— Ramond, L. (1903) *Ann. Derm. Syph., Paris*, 4, 678.
Foerster, H. R. (1924) *Amer. J. med. Sci.* 167, 54.
French, E. D. (1941) *J. Florida med. Ass.* 28, 61.
Gastineau, F. M., Spolyar, L. W., Haynes, E. (1941) *J. Amer. med. Ass.* 117, 1074.
Gaucher, E. (1910) Diseases of the Skin, London, p. 357.
Gray, A. M. H., Bamber, G. W. (1932) *Proc. R. Soc. Med.* 25, 663.
Jacobson, H. P. (1932) Fungous Diseases, London, p. 121.
Schenck, B. R. (1898) *Bull. Johns Hopk. Hosp.* 9, 286.
Welder, H., McCullough, C. P. (1914) *J. Amer. med. Ass.* 62, 1156.

PEPTIC ULCER

TREATED WITH GASTRIC AND INTESTINAL EXTRACTS

O. HUBACHER
M.D. Berne

From the Medical Ambulatory Clinic of the University of Berne, Switzerland

SINCE certain substances occurring naturally in the body—e.g., histamine—can give rise to peptic ulcer (Matsueda 1931, Friedenwald et al. 1932, Carnot et al. 1933), it is reasonable to suppose that other substances occurring naturally in the body may prevent ulcer formation. Many biologically active substances have been isolated from the intestinal tract—e.g., cholecystokinin, secretin, enterocrinin, villikinin, enterogastrone, and urogastrone. Knowledge of enterogastrone and urogastrone is due to Gray (1941), Quigley (1941), Sandweiss et al. (1941), and Ivy (1941). Enterogastrone, extracted from the intestinal mucosa, diminishes gastric secretion, decreases gastric motility, and participates in the regulation of the blood-supply to the gastric and duodenal mucosa. Thus enterogastrone can largely prevent the appearance of intestinal ulcer in dogs subjected to duodeno-ileal anastomosis and gastrojejunostomy according to the technique of Mann and Bollmann (1933). Urogastrone is a substance, analogous to enterogastrone, obtained from urine; it is found in decreased quantity in the urine of ulcer patients, and it has been assumed to represent an excretory form of enterogastrone. Good results have been obtained in cases of gastroduodenal ulcer by injection of urogastrone, but experience of administration of enterogastrone has apparently not yet been reported.

Independently of the results obtained in the United States, extracts have been prepared in Switzerland from the tissue of the stomach and the small intestine of freshly slaughtered animals. These extracts[1] are free from lipoids and proteins. The water-soluble part of the finished extract is used for injection, and the water-insoluble fraction is put up in tablets, to make possible the simultaneous administration of injections and tablets. The preparation for the treatment of gastric ulcer contains predominantly extract of stomach, whereas that for the treatment of duodenal ulcer contains principally extract of small intestine.

The treatment of gastritis, gastric ulcer, and duodenal ulcer with gastroduodenal extracts is based on the upposition that the normal functions of the stomach and the duodenum are maintained by various biologically active substances, the absence of which favours ulcer formation. In Switzerland this therapy has been not only the subject of much clinical work (Schmassmann 1944, 50 cases; Mamie 1944, 24 cases; Keiser 1945, 37 cases; Neumann 1946, 55 cases; Berther 1944, 20 cases) but also of an experimental investigation by Roulet (1945), who obtained rapid healing of histamine ulcers in guineapigs, even when the ulcerative agent, histamine, continued to be given.

The direction of attention to a new form of ulcer therapy is justified on the following grounds:

(1) The increasing incidence of gastric and duodenal ulcers.

(2) The unsatisfactory outcome of other forms of ulcer therapy, including treatment with sexual and adrenocortical hormones, whereby undesirable secondary effects (diminished potency, mastodynia, œdema, hypertension) are caused.

(3) In general practice the imposition of a strict diet is not easy, and the wish of a patient not to cease work must often be granted.

MATERIAL AND METHODS OF TREATMENT

Our experience of treatment with the robuden preparations extends over sixteen months and comprises 54 cases: 25 gastric ulcers, of which 9 were indurated; 15 duodenal ulcers, of which 1 was indurated; 3 cases of simultaneous gastric and duodenal ulcers; 7 of gastritis; and 4 tumours.[2]

The great majority of the patients were ambulant; only 3 patients were admitted to hospital for treatment. These 3 patients were given a strict diet, but the other patients were simply advised to avoid articles of food which, in their own experience, gave rise to symptoms. Most of the patients never absented themselves from their work; this feature of the treatment, together with the obviation of confinement to bed and dieting, constitutes a real advantage, especially in view of the continuing increased incidence of ulcer.

Where possible both injections and tablets were given. The total number of injections ranged from 12 to 21, given either daily or three times a week; the tablets were given at the rate of 3 a day before meals or at the rate of 6 a day, 1 tablet before and 1 tablet after each meal, for several months. In especially resistant cases the number of injections was increased to 30 or more. In the case of patients who refused the injections, or who on practical grounds could not attend daily for injection and did not wish to be admitted to hospital, only the tablets were prescribed. Patients with gastric ulcer were treated with stomach extract, and patients with duodenal ulcer were given extract of small intestine. Patients with both gastric and duodenal ulcers were treated with both extracts given alternately. Disregard of this principle by treating one such patient with stomach extract alone led to healing of the gastric ulcer in the usual time, whereas the duodenal ulcer remained unaltered.

RESULTS

In estimating the success attained, attention has been directed principally to alterations in the general subjective condition, disappearance of symptoms, and decrease in size of the ulcer niche as disclosed radiologically. Decrease in size rather than disappearance of the niche is emphasised, because experience has shown that an ulcer may escape radiological observation by becoming filled with remnants of food or as the result of œdematous alteration of the mucosa. The acidity values have been neglected, because this aspect has already been exhaustively dealt with by Schmassmann (1944), Neumann (1946), and others, and because modern work tends to assign less importance to the gastric chemical processes in regard to the diagnosis and treatment of digestive troubles. Schmassmann reported that robuden exercised a regulatory action on gastric acidity, both hyperchlorhydria and hypochlorhydria tending to return to normal.

RESULTS OF TREATMENT OF PEPTIC ULCER WITH TISSUE EXTRACTS

Diagnosis	No. of cases	On the basis of—			
		Subjective and clinical examination		Radiological examination	
		Good results	No improvement	Good results	No improvement
Simple gastric ulcer ..	16	16	0	7*	0
Indurated gastric ulcer..	9	6	3	4	5
Simple duodenal ulcer ..	14	13	1	6†	1†
Indurated duodenal ulcer	1	0	1	0	1
Gastric ulcer and duodenal ulcer	3	3	0	3	0
Gastritis	7	6	1	2‡	0
Tumour	4	0	4	0	4

* Only these 7 cases out of the total of 16 were followed radiologically.
† ,, 7 ,, ,, ,, 14 ,, ,, ,,
‡ ,, 2 ,, ,, ,, 7 ,, ,, ,,

Of the 54 cases, 33 were followed radiologically; the remaining 21 cases were examined radiologically at least once.

The table shows a lack of good response to treatment in the indurated ulcers, whilst Schmassmann (1944), Hemmeler (1944), and Mamie (1944) also reported lack of success with such ulcers. We found subjective and objective clinical improvement in two-thirds of the cases of indurated ulcer, although rather less than half of them showed radiological improvement. The suitability or otherwise of an ulcer to treatment with these extracts depends on the radiological structure of the ulcer niche rather than on its size. In 2 cases of indurated ulcer, after failure of ambulant treatment, admission to hospital and prescription of a strict diet did not lead to improvement, probably because the ulcers had caused structural anatomical changes requiring surgical intervention. In one case the persistence of subjective symptoms was due to the gastric crises of tabes. In one case of duodenal ulcer and in one of gastritis there was radiological improvement coupled with unchanged subjective and clinical symptoms; psychiatric examination disclosed a neurosis in both cases.

The time required for the treatment to produce an effect is very variable; improvement rarely took place before the tenth injection, or, if tablets alone were administered, before fourteen days. On completion of a course of injections, the tablets should continue to be taken for 2–3 months.

---

[1] 'Robuden pro U. ventr.,' 'Robuden pro U. duod,' and 'Robuden' tablets made by the Robapharm Laboratories, Basle.

[2] Abstracts of the case-records can be obtained from the author.

Secondary Effects.—Apart from occasional severe pain at the injection site, no undesirable secondary effects have been encountered; onset of fever in 2 cases was traced to the fortuitous presence of pulmonary and of oral infection. As the extracts are free from protein, activation of an intercurrent malady is unlikely.

Relapses.—Schmassmann (1944) suggested the administration of robuden tablets in the spring and autumn as a prophylactic measure; this suggestion has been taken up in many clinics and in general practice, and we also have adopted it. The period of our observations is yet too brief to permit conclusions to be drawn; but, excluding cases of indurated ulcer, we have encountered only 3 cases of relapse in sixteen months; and these were cases not submitted to this prophylactic treatment. It may be noted that the number of relapses following other earlier medical treatments was much greater.

SUMMARY

Of 54 cases treated with extracts of stomach and of small intestine 44 showed good results, the majority being subjected to radiological control. The 10 failures included 2 neuroses, 3 indurated ulcers, old scarry deformations (1 case), carcinoma (3 cases), and 1 gastric tumour. (Previous publications in Switzerland list 234 cases, of which 209 (89%) reacted favourably to this treatment.)

All the cases which benefited by this treatment showed rapid disappearance of symptoms, increase of weight, and rapid decrease in size of the ulcer niche as disclosed by radiography. Some cases of indurated ulcer reacted favourably, but others, and cases involving tumours, were not influenced.

These results were obtained without dietetic restriction or confinement to bed.

Injection of the preparations gave rise to no undesirable secondary effects apart from occasional pain at the injection site.

The administration of the extracts as tablets to supplement the injections and as prophylaxis is suggested.

I wish to thank Prof. W. Hadorn, director of the Medical Ambulatory Clinic of the University of Berne, for his advice and encouragement.

REFERENCES

Berther, S. (1944) *Schweiz. med. Wschr.* **74**, 1334.
Carnot, P., Simmonet, H., Tissier, M., Cachera, R. (1933) *C.R.Soc. Biol. Paris*, **113**, 1517.
Friedenwald, J., Feldmann, M., Morrison, S. (1932) *Trans. Amer. gastro-ent. Ass.* **35**, 327.
Gray, J. S. (1941) *Amer. J. digest. Dis.* **8**, 365.
Hemmeler, G. (1944) *Gastroenterologia*, **69**, nos. 3-4.
Ivy, A. C. (1941) *Amer. J. digest. Dis.* **8**, 361.
Keiser, D. (1945) *Schweiz. med. Wschr.* **75**, 913.
Mamie, M. (1944) *Praxis*, no. 42.
Mann, F. C., Bollmann, J. L. (1933) *J. Amer. med. Ass.* **99**, 1576.
Matsueda (1931) *Klin. Wschr.* **10**, 2265.
Neumann, H. (1946) *Schweiz. med. Wschr.* (in the press).
Quigley, J. P. (1941) *Amer. J. digest. Dis.* **8**, 363.
Roulet, F. (1945) *Schweiz. med. Wschr.* **75**, 912.
Sandweiss, D. J., Sugarman, M. H., Friedman, M. H. F., Salzstein, H. C., Farbmann, A. A. (1941) *Amer. J. digest. Dis.* **8**, 371.
Schmassmann, H. (1944) *Schweiz. med. Wschr.* **74**, 576.

Reviews of Books

Principles of Dynamic Psychiatry

Including an Integrative Approach to Abnormal and Clinical Psychology. JULES H. MASSERMAN, M.D., division of psychiatry, University of Chicago. London: W. B. Saunders. Pp. 322. 20*s.*

THE aim of this intelligent and ambitious book is to introduce the student to the principles of modern dynamic psychiatry; a companion volume will elaborate the application of these principles to diagnosis and treatment. The book has arisen out of the author's need as a teacher to have a test to which he could refer his students for basic information; he points out that at present the beginner may "either become compulsively and sometimes morbidly intrigued with some special and narrow approach (such as the 'somatic,' 'reflexologic,' 'semantic,' or 'psychoanalytic') or he may fly from the wilderness of some of the current literature and from his own anxieties by deciding, not altogether correctly, that psychiatry is a contentious cacophony of fantastic dogmas, contradictory nosologies, and impractical theories somehow inserted into an otherwise 'scientific' university or medical school curriculum." Thus obviously aware of some of the pitfalls, Dr. Masserman has done his best to synthesise the products of his wide reading, his clinical and psychological experience, and his valuable experiments into the relationship of the hypothalamus to behaviour in the cat: the outcome is a stimulating, slightly pretentious book which students will find harder to read and much more solid and satisfying than the usual hackneyed expositions.

Psychiatry as a medical science, psychological and psycho-analytical concepts of behaviour, and the dynamics of adaptation and mental disorder make up the first part of the book: in the second a general biodynamic theory of behaviour is put forward, with frequent, sometimes critical, reference to the theory of conditioned reflexes and to psycho-analysis, from which the author's "biodynamic correlations" are largely derived. The last chapter of the work is devoted, very agreeably, to a critique of the biodynamic theory: the author puts his theory in the dock, and after fair and kindly examination of what prosecuting counsel have to say, acquits it of everything except necessary incompleteness. Appendices contain an illustrative account of the psycho-analysis of a neurotic personality, and reprinted articles on psycho-analytic formulation of the psychoses, and some principles of group communication. A bibliography of about 200 titles, and a glossary, complete the slightly exuberant book.

Postural Circulatory and Respiration Changes During Ether and Intravenous Anesthesia

TORSTEN GORDH, anæsthetist-in-chief, Karolinski Sjukhuset, Stockholm. Stockholm: *Acta Chirurgica Scandinavica.* Supplement CII. Pp. 126.

Dr. Gordh has undertaken the sort of fundamental research in anæsthetics which is still needed. The work, profusely illustrated with kymographic records, is divided into three parts. The first contains an extensive summary of the literature on the effects of ether and barbiturate anæsthesia on the circulation and respiration. (The first description of intercostal paralysis as a sign of deep anæsthesia is here attributed to Albert Miller, in 1925, instead of Snow, who described it in 1858.) The second part records the author's own researches on the rabbit, which confirm the clinical findings of every anæsthetist. Dr. Gordh demonstrates the benefit of a moderate Trendelenburg position on the circulation and respiration, and the baneful effects of anoxia and of carbon dioxide excess. In the third part the value of the head-down posture and oxygen excess in the treatment of cardiorespiratory failure during clinical anæsthesia is discussed and emphasised. English-speaking anæsthetists will be gratified to learn that such excellent fruit as this monograph has sprung from seeds sown during Dr. Gordh's visits to this country and to America.

Ocular Prosthesis

J. H. PRINCE, F.B.O.A., F.S.M.C. Edinburgh: E. & S. Livingstone. Pp. 134. 17*s.* 6*d.*

Mr. Prince sets out to describe the process by which artificial eyes may be made and fitted, and he gets to the root of his subject by a first chapter on the history and development of artificial eyes from 2500 B.C. onwards, and follows it with a chapter on the anatomy and physiology of the orbit. This second chapter needs serious revision; many random and inaccurate statements are made on the pathology and surgery of the eye and orbit, and many other statements leave one in doubt as to their true meaning. The words exenteration and evisceration are repeatedly confused, and there is an unsatisfactory diagram of the anatomy of the orbit and surrounding structures. The chapter on the principles of fitting prostheses concludes with some harrowing descriptions of how eyes may be lost. In the latter half of the book Mr. Prince is on his own ground, and here the reader will get some help on the fitting and making of artificial eyes. When this book has been revised with the aid of an ophthalmic surgeon it will fill a definite need, especially among artificial-eye makers.

Yes, doctor, a boon to patient . . . and me . . .

Hyperduric ADRENALINE is one of the new series of preparations developed from the discovery that drugs injected in the form of mucates, instead of the usual salts, such as hydrochlorides, are liberated slowly and uniformly, yielding controlled prolongation of pharmacological action. ***Hyperduric*** ADRENALINE is a solution containing 1 part of adrenaline in 1000, as mucate. It is of value in bronchial asthma and other allergic disturbances, including anaphylactic (e.g. serum) shock, besides surgical shock. The relief is observable for a period of 8 to 10 hours in patients who have previously experienced relief for periods of only ½ to 2 hours after an injection of adrenaline hydrochloride solution.

Hyperduric

(Trade Mark)

ADRENALINE

for PROLONGED action

Ampoules of 0·6 c.c. : box of 12, 5/-
Ampoules of 1·1 c.c. : box of 12, 6/-
Rubber capped bottle of 5 c.c., 3/6

Literature on request

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE BISHOPSGATE 3201 (12 LINES) TELEGRAMS "GREENBURYS BETH. LONDON"

Secondary Effects.—Apart from occasional severe pain at the injection site, no undesirable secondary effects have been encountered; onset of fever in 2 cases was traced to the fortuitous presence of pulmonary and of oral infection. As the extracts are free from protein, activation of an intercurrent malady is unlikely.

Relapses.—Schmassmann (1944) suggested the administration of robuden tablets in the spring and autumn as a prophylactic measure; this suggestion has been taken up in many clinics and in general practice, and we also have adopted it. The period of our observations is yet too brief to permit conclusions to be drawn; but, excluding cases of indurated ulcer, we have encountered only 3 cases of relapse in sixteen months; and these were cases not submitted to this prophylactic treatment. It may be noted that the number of relapses following other earlier medical treatments was much greater.

SUMMARY

Of 54 cases treated with extracts of stomach and of small intestine 44 showed good results, the majority being subjected to radiological control. The 10 failures included 2 neuroses, 3 indurated ulcers, old scarry deformations (1 case), carcinoma (3 cases), and 1 gastric tumour. (Previous publications in Switzerland list 234 cases, of which 209 (89%) reacted favourably to this treatment.)

All the cases which benefited by this treatment showed rapid disappearance of symptoms, increase of weight, and rapid decrease in size of the ulcer niche as disclosed by radiography. Some cases of indurated ulcer reacted favourably, but others, and cases involving tumours, were not influenced.

These results were obtained without dietetic restriction or confinement to bed.

Injection of the preparations gave rise to no undesirable secondary effects apart from occasional pain at the injection site.

The administration of the extracts as tablets to supplement the injections and as prophylaxis is suggested.

I wish to thank Prof. W. Hadorn, director of the Medical Ambulatory Clinic of the University of Berne, for his advice and encouragement.

REFERENCES

Berther, S. (1944) *Schweiz. med. Wschr.* **74**, 1334.
Carnot, P., Simmonet, H., Tissier, M., Cachera, R. (1933) *C.R. Soc. Biol. Paris*, **113**, 1517.
Friedenwald, J., Feldmann, M., Morrison, S. (1932) *Trans. Amer. gastro-ent. Ass.* **35**, 327.
Gray, J. S. (1941) *Amer. J. digest. Dis.* **8**, 365.
Hemmeler, G. (1944) *Gastroenterologia*, **69**, nos. 3–4.
Ivy, A. C. (1941) *Amer. J. digest. Dis.* **8**, 361.
Keiser, D. (1945) *Schweiz. med. Wschr.* **75**, 913.
Mamie, M. (1944) *Praxis*, no. 42.
Mann, F. C., Bollmann, J. L. (1933) *J. Amer. med. Ass.* **99**, 1576.
Matsueda (1931) *Klin. Wschr.* **10**, 2265.
Neumann, H. (1946) *Schweiz. med. Wschr.* (in the press).
Quigley, J. P. (1941) *Amer. J. digest. Dis.* **8**, 363.
Roulet, F. (1945) *Schweiz. med. Wschr.* **75**, 912.
Sandweiss, D. J., Sugarman, M. H., Friedman, M. H. F., Salzstein, H. C., Farbmann, A. A. (1941) *Amer. J. digest. Dis.* **8**, 371.
Schmassmann, H. (1944) *Schweiz. med. Wschr.* **74**, 576.

Reviews of Books

Principles of Dynamic Psychiatry

Including an Integrative Approach to Abnormal and Clinical Psychology. JULES H. MASSERMAN, M.D., division of psychiatry, University of Chicago. London: W. B. Saunders. Pp. 322. 20*s.*

THE aim of this intelligent and ambitious book is to introduce the student to the principles of modern dynamic psychiatry; a companion volume will elaborate the application of these principles to diagnosis and treatment. The book has arisen out of the author's need as a teacher to have a test to which he could refer his students for basic information; he points out that at present the beginner may "either become compulsively and sometimes morbidly intrigued with some special and narrow approach (such as the 'somatic,' 'reflexologic,' 'semantic,' or 'psychoanalytic') or he may fly from the wilderness of some of the current literature and from his own anxieties by deciding, not altogether correctly, that psychiatry is a contentious cacophony of fantastic dogmas, contradictory nosologies, and impractical theories somehow inserted into an otherwise 'scientific' university or medical school curriculum." Thus obviously aware of some of the pitfalls, Dr. Masserman has done his best to synthesise the products of his wide reading, his clinical and psychological experience, and his valuable experiments into the relationship of the hypothalamus to behaviour in the cat: the outcome is a stimulating, slightly pretentious book which students will find harder to read and much more solid and satisfying than the usual hackneyed expositions.

Psychiatry as a medical science, psychological and psycho-analytical concepts of behaviour, and the dynamics of adaptation and mental disorder make up the first part of the book: in the second a general biodynamic theory of behaviour is put forward, with frequent, sometimes critical, reference to the theory of conditioned reflexes and to psycho-analysis, from which the author's "biodynamic correlations" are largely derived. The last chapter of the work is devoted, very agreeably, to a critique of the biodynamic theory: the author puts his theory in the dock, and after fair and kindly examination of what prosecuting counsel have to say, acquits it of everything except necessary incompleteness. Appendices contain an illustrative account of the psycho-analysis of a neurotic personality, and reprinted articles on psycho-analytic formulation of the psychoses, and some principles of group communication. A bibliography of about 200 titles, and a glossary, complete the slightly exuberant book.

Postural Circulatory and Respiration Changes During Ether and Intravenous Anesthesia

TORSTEN GORDH, anæsthetist-in-chief, Karolinski Sjukhuset, Stockholm. Stockholm: *Acta Chirurgica Scandinavica.* Supplement CII. Pp. 126.

Dr. Gordh has undertaken the sort of fundamental research in anæsthetics which is still needed. The work, profusely illustrated with kymographic records, is divided into three parts. The first contains an extensive summary of the literature on the effects of ether and barbiturate anæsthesia on the circulation and respiration. (The first description of intercostal paralysis as a sign of deep anæsthesia is here attributed to Albert Miller, in 1925, instead of Snow, who described it in 1858.) The second part records the author's own researches on the rabbit, which confirm the clinical findings of every anæsthetist. Dr. Gordh demonstrates the benefit of a moderate Trendelenburg position on the circulation and respiration, and the baneful effects of anoxia and of carbon dioxide excess. In the third part the value of the head-down posture and oxygen excess in the treatment of cardiorespiratory failure during clinical anæsthesia is discussed and emphasised. English-speaking anæsthetists will be gratified to learn that such excellent fruit as this monograph has sprung from seeds sown during Dr. Gordh's visits to this country and to America.

Ocular Prosthesis

J. H. PRINCE, F.B.O.A., F.S.M.C. Edinburgh: E. & S. Livingstone. Pp. 134. 17*s.* 6*d.*

Mr. Prince sets out to describe the process by which artificial eyes may be made and fitted, and he gets to the root of his subject by a first chapter on the history and development of artificial eyes from 2500 B.C. onwards, and follows it with a chapter on the anatomy and physiology of the orbit. This second chapter needs serious revision; many random and inaccurate statements are made on the pathology and surgery of the eye and orbit, and many other statements leave one in doubt as to their true meaning. The words exenteration and evisceration are repeatedly confused, and there is an unsatisfactory diagram of the anatomy of the orbit and surrounding structures. The chapter on the principles of fitting prostheses concludes with some harrowing descriptions of how eyes may be lost. In the latter half of the book Mr. Prince is on his own ground, and here the reader will get some help on the fitting and making of artificial eyes. When this book has been revised with the aid of an ophthalmic surgeon it will fill a definite need, especially among artificial-eye makers.

Yes, doctor, a boon to patient . . . and me . . .

Hyperduric ADRENALINE is one of the new series of preparations developed from the discovery that drugs injected in the form of mucates, instead of the usual salts, such as hydrochlorides, are liberated slowly and uniformly, yielding controlled prolongation of pharmacological action. ***Hyperduric*** ADRENALINE is a solution containing 1 part of adrenaline in 1000, as mucate. It is of value in bronchial asthma and other allergic disturbances, including anaphylactic (e.g. serum) shock, besides surgical shock. The relief is observable for a period of 8 to 10 hours in patients who have previously experienced relief for periods of only ½ to 2 hours after an injection of adrenaline hydrochloride solution.

Hyperduric

(Trade Mark)

ADRENALINE

for PROLONGED action

Ampoules of 0·6 c.c. : box of 12, 5/-
Ampoules of 1·1 c.c. : box of 12, 6/-
Rubber capped bottle of 5 c.c., 3/6

Literature on request

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE BISHOPSGATE 3201 (12 LINES). TELEGRAMS "GREENBURYS, BETH, LONDON"

PENICILLIN

for minor infections

The imposing list of indications for penicillin therapy must not obscure the very great importance of this wholly non-toxic substance in the treatment of minor infections. Penicillin is unaffected by the presence of serum or pus, is completely innocuous to the leucocytes, and has a higher activity against the common pathogenic organisms than any other chemotherapeutic agent.

It has great value, therefore, in the treatment of septic cuts, abrasions and burns, boils, sore throats and many other every-day conditions; and may well alter the whole conception of prophylactic treatment of those minor ailments.

PENICILLIN *Glaxo*

DRY SODIUM SALT FOR INJECTION IN AQUEOUS SOLUTION

Prices subject to usual professional discount.

PACKS OF SINGLE VIALS : *100,000 units, 2/9; 200,000 units, 4/9; 500,000 units, 10/6; 1 mega (1,000,000 units) 20/-.*
PACKS OF 10 VIALS : *100,000 units each, 27/6; 200,000 units each, 47/6; 500,000 units each, 105/-; 1 mega (1,000,000) units each, 200/-.*

Manufacturers of
PENICILLIN

OILY INJECTION OF PENICILLIN B.P. *For intramuscular injection. 125,000 units per cc. of calcium salt in oil and beeswax 10 cc. vials.*
PENICILLIN LOZENGES B.P. *For oral use. Each lozenge contains 500 units of calcium penicillin. Bottles of 50 and 500*

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 34

Colourless Flavine

● For application to cuts and wounds, 5-Aminoacridine, an all-round useful antiseptic, is now made available in water-soluble jelly form as 'Flavogel' (1 in 500).

Related to acriflavine, the bactericidal activity of this new antiseptic is a more effective aid to healing because it interferes less with the formation of granulation tissue.

Moreover, it does not stain the skin, and the slight discolouration of fabrics is easily washed out.

PRODUCT OF THE GLAXO LABORATORIES

FLAVOGEL

5-AMINOACRIDINE HYDROCHLORIDE
1½ oz. and 9 oz.

● *5-Aminoacridine is also available as a powder for making up solutions in water, isotonic saline or alcohol.*

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

THE LANCET

LONDON: SATURDAY, AUGUST 24, 1946

The Peptic Ulcer

THE natural history and treatment of peptic ulcer are still two of the most important problems of medicine, and further inquiry into their environmental and economic aspects is badly needed. Already, however, such studies have begun to give useful indications. In younger people, at any rate, it seems that the mortality from gastric ulcer is related both to poverty and to employment, though in the latter case it is an inverse relationship in that a rise in employment tends to be associated with an increase in mortality, perhaps because of the extra stresses and strains of work as against the leisure of unemployment! As MORRIS and TITMUSS[1] have written, "it is hard to resist the conclusion that urban life nowadays is an ideal soil for the flowering of the ulcer temperament." Psychosomatic factors concerned in ulcer formation have had much attention, and such observations as those of WOLFF and WOLF on their patient "Tom" have demonstrated beyond question the extreme changes that the gastric mucosa may show under emotional stimuli, particularly those associated with feelings such as frustration or resentment. The influence of emotion on the "psychic secretion" of gastric hydrochloric acid, and on the tone and motility of the stomach, has also been demonstrated. For instance, MCCARTHY,[2] at the Mayo Clinic, finds that mice which show great enthusiasm at the sight of food also have a greater gastric secretion than those apparently indifferent to food. From this work he concludes, with others, that a simple gastric test-meal without correction for dilution with duodenal juice, and without some separation of the different phases of secretion (nervous and chemical), is liable to be fallacious. There are, as he says, many possible causes of high acidity, such as excessive psychic stimulation, increased gastric or intestinal chemical excitation, imperfect regurgitation from the duodenum, and even excessive absorption of water. Both the psychic and the intragastric chemical phases of secretion are controlled largely by the vagus, and his experiments in mice show that they can be influenced by vagotomy. This operation greatly reduced gastric acidity in his mice, and on the view that ulcer healing demands control of gastric acid it has already been tried in man for the treatment of peptic ulcer.

One of the many important investigations into the chemical control of acidity has been the work on the isolation of enterogastrone, to which an article by Dr. HUBACHER in our present issue again calls attention. This investigation, developed during in the war, was based on the familiar fact that fats in the intestine have an inhibitory effect on the pepsin-secreting cells in the stomach, and that the same inhibition takes place in gastric pouches deprived of any nerve-supply. By making an extract of intestinal mucosa which had been in contact with fat, KOSAKA and LIM[3] produced a substance to which they gave the name enterogastrone, which inhibited gastric secretion by a humoral mechanism. Later IVY and his co-workers studied this substance, and purified it considerably, so that it has been used (as has a similar substance found in normal urine and called urogastrone) in the treatment of patients with peptic ulcer. Now Dr. HUBACHER is able to report results of the treatment, with gastroduodenal extracts, of 54 patients suffering from gastric or duodenal ulcers. The idea behind this treatment is that normal gastric and duodenal function is maintained through the stimulus of various biologically active substances (such as enterogastrone) which are present in healthy mucosa and whose absence favours ulcer. The extracts used by Dr. HUBACHER are in his opinion specific in the sense that he was successful only when stomach extract was used for gastric ulcer, and small-intestine extract for duodenal ulcer, and not if the extracts were reversed. Of his 54 patients, mainly ambulant, most were given treatment by injection as well as by mouth, and did not leave off work or abide by any strict diet; and of these 54, all but 10 showed "good results" over sixteen months.

Such reports necessarily call to mind the similar results obtained at first by injection of histidine, which has not, however, substantiated its claim to be a specific remedy. As a correspondent points out on p. 272, the last word in these matters rests with the statistician, and before drawing conclusions about the treatment of peptic ulcer a great deal of attention must be paid to controls. In few other fields of therapeutics is it so difficult to judge the efficacy of alternative forms of treatment, and any period of observation of less than five years is open to the criticism that natural remissions are characteristic of peptic ulcer, and that long periods of healing and freedom from symptoms may follow the most varied forms of treatment or none at all. The facts as known at present certainly do not justify discarding the proved aids of rest, diet, and regimen, and while we continue to believe in a neurogenic factor in causation, we must recognise the effect of suggestion, encouragement, and confidence, in the control of symptoms.

"Patent" Medicines

THE publication of *Secret Remedies* and *More Secret Remedies* by the British Medical Association[1] some thirty-five years ago drew public attention to a public scandal. Though analyses of many worthless "patent" medicines had previously been published in these columns and elsewhere, the two books represented a declaration of war by the profession. At first success seemed certain; a Royal Commission was set up and declared itself emphatically against "cunning swindlers who exploit for their own profit the apparently invincible credulity of the public." Unhappily, its report was published on August 4, 1914, and for the next four years Parliament was otherwise occupied; but the commission's findings have remained the yardstick for the measurement of progress. That substantial progress has been made cannot be denied, though legislation still falls short, in some respects, of that recommended in 1914. Among Parliament's contributions have been the elimination, in 1917, of the treatment of venereal diseases by the unqualified; the Dangerous Drugs

---

[1] Morris, J. N., Titmuss, R. M. *Lancet*, 1944, ii, 841.
[2] McCarthy, H. H. *Proc. Mayo Clin.* 1946, 21, 142.
[3] Kosaka, T., Lim, R. K. *Proc. Soc. exp. Biol. Med.* 1930, 27, 890.

[1] Secret Remedies, B.M.A., London, 1909. More Secret Remedies, 1912.

Act of 1920, which stopped the sale of drugs of addiction except by a doctor's order; the Poisons Rules of 1935, which require that any preparation containing a poison must be explicitly labelled; and, perhaps most important of all, the Pharmacy and Medicines Act of 1941, which in the turmoil of the second world war slipped on to the statute-book almost unnoticed, except by the trade. Its outstanding provision is that the formula of "any article consisting of or comprising a substance recommended as a medicine" must be disclosed on the label, though unfortunately it does not insist that the substances should be called by their usual names. Other bodies too have played their part. The Pharmaceutical Society, under the Pharmacy and Poisons Act of 1933, has a disciplinary committee competent to strike from the register a pharmacist shown to have been guilty of misconduct; a considerable section of the daily press, through the Newspaper Proprietors' Association, acknowledges a self-imposed censorship of advertisements; and the Advertising Association, the Proprietary Association of Great Britain, and the Chemists' Friends Association all have agreed codes.

Is this enough? Mr. HUGH LINSTEAD, M.P., himself a pharmacist of wide administrative experience, replies emphatically No in a monograph[2] which, if it misses the incisiveness of the late Prof. A. J. CLARK's classical review of the same field,[3] is yet a balanced and scrupulously fair survey. Mr. LINSTEAD very properly explains that, despite the booklet's title, his quarrel is not with patent medicines (for with present-day law there are none) nor with the reputable proprietary preparations which most doctors are glad to use, but with the more dubious concoctions sold direct to the public—whose advertisement fosters needless fear of disease and which slim the nation's purse to the tune of £12–15 million a year. He gives a moderate but informative account of the subtleties by which this money is wheedled out of the public's pocket: he has a word for the unsolicited testimonial, the pseudo-scientific jargon and the extravagant claims of advertisements, the stimulation of false hope in the chronically sick, and, above all, the reliance on fear. On the effects of the trade he is at one with CLARK, who held that "the harm done by the frightening of individuals is much less serious than the harm that results from subjecting the public to a steady stream of misinformation regarding the elementary laws of health." Dr. THOMPSON's article on p. 280 shows how freely this stream still flows.

Mr. LINSTEAD ascribes omission to control the trade not so much to vested interest or awe of the press (which, of course, is closely affected) as to lack of public demand. The truth, he says, is that most manufacturers see to it nowadays that active ingredients are contained in their preparations, and one way or another, most of them do benefit their adherents. But he thinks that this trade fosters disease-consciousness, and leads to the postponement of seeking skilled advice, and that prices are often excessive. He suggests that the Minister of Health should be charged with over-seeing proprietary medicines; that a register of manufacturers and medicines should be kept, and that a medicine not complying with statutory conditions should be suppressed; and that advertisement and postal offers of diagnosis and treatment should be more strictly controlled, particularly to exclude false, misleading, or exaggerated claims.

Mr. LINSTEAD sees in this an element of conflict between State and individual; for he adds that "the advertising of proprietary medicine undermines public confidence in a State medical service and in the registered medical practitioners at whose hands such a service must be provided." Perhaps Mr. BEVAN also holds this view; during the committee stage of the National Health Service Bill he was heard to say that he regarded extension of the law "as a matter of some urgency."[4] The captious may reason that the warrant for further legislation was as vali years ago as it is today; but few will dispute the ne for legislation, whatever the reasoning behind i It will not be easy. What, for example, are to b the "statutory conditions" which the Minister o Health is to enforce, and how are they to be interpreted? In pharmacology the borderline betwee the active and the inert, between the therapeuti and the useless dose, is still often obscure; an if some of the conditions are to rest on such data the Minister may be denied the precise guidance h will need. But we should not be deterred by punctilio The *Economist*,[5] advocating the control of advertisements and a cost analysis, says: "If the patien does not believe the doctor when he is told that ther is nothing the matter with him, or if he does not wan to consult a doctor at all, he will be able to bu medicines that do not require a medical prescriptio at the chemist's shop. . . . But at least he will not b subjected to constant external pressure to make hi into a constipated hypochondriac." We may all accep at least this modest ambition as a first aim.

Repair of Nerve Injuries

DURING the last few years much experimental wor has thrown doubt on the view, expressed at the en of the 1914–18 war, that in the treatment of peripher nerve injuries the result is largely independent of th interval between wounding and surgical repair.[6] Th Americans, having made up their minds that delay harmful, laid their plans accordingly, and SPURLIN and WOODHALL[7] now report a series of nearly 300 early nerve operations carried out in America military hospitals in the United Kingdom, in th period roughly covered by the invasion of Europ until VE-day. In the opening phases of the ca paign the average delay before operation was 28 days in the time of heaviest fighting before VE-day i rose to 42 days, owing to the great pressure o work; and the average for the whole period wa 39 days.

Nerve suture was performed in 54% of the operations—about 1500 sutures in all—and it was foun that the operations presented relatively little difficult There was very little scarring, and the stumps were s readily mobilised that the number of gaps that coul not be closed by end-to-end suture was less than 1% The comparative absence of scarring must, of course have been attributable rather to the excellence o e primary wound treatment than to the shortness ' the time since injury. These were, however, only condary considerations, and SPURLING and WOODHALL ery properly base their advocacy of early secondary ıture on the favourable condition of the peripheral erve stump and of the denervated muscles during ıe early days after injury.[8] With the passage of me serious and ultimately irreversible changes take lace. Yet, although American and British surgeons re now convinced of the merits of early intervention, ; still remains to be decided whether early secondary uture is superior to primary. Theoretically, it is ıot; but, because of the unpredictable character of nost injuries damaging nerves, the primary operation resents certain technical hazards, the most important f which, as ZACHARY and HOLMES [9] have pointed out, s the difficulty in estimating the extent of intraıeural damage that accompanies every nerve division. Their condemnation of primary suture is shared, so ar as war injuries are concerned, by SPURLING and WOODHALL.

---

[2] Patent Medicines: an Indictment. Hugh Linstead. Obtainable from *National News-Letter*, 162, Buckingham Palace Road, London, S.W.1. Pp. 33. 1s.

[3] Clark, A. J. Patent Medicines, London, 1938.

[4] Standing Committee C: official report, July 2, 1946, para. 95

[5] Jan. 6, 1945.

[6] Medical Research Council, Report on Peripheral Nerve Injurie 1920.

[7] Spurling, R. G., Woodhall, B. *Ann. Surg.* 1946, 123, 731.

A comprehensive survey of the end-results in their ases cannot be made for another two or three years, but a certain number of undoubted failures have already been recorded. Among 89 primary sutures there were 20 failures—a rate of 22%—which is distinctly higher than their figure of 5% for the series of early secondary sutures. The follow-up period had necessarily been very short: only 12 cases in one group of 649 have been examined more than a year after suture and only 201 cases have been followed for six months; so the authors have had to be content with recording only the first signs of recovery. Early indications of return of motor or sensory function were noted in slightly more than half of all cases seen six months or more after operation.

There is no doubt that the vigorous and sane policy pursued by Colonel GLEN SPURLING when he was consultant in neurosurgery in the European theatre of operations resulted in the performance of nerve suture in a very large series of cases under conditions more favourable than have ever been known before. The series of cases now reported is unique, and it is therefore all the more important that the most strenuous efforts should be made to keep in touch with all these patients. The late results may well prove the most informative in the whole history of peripheral nerve surgery.

---

8. Bowden, R. E. M., Gutmann, E. *Brain*, 1944, 67, 273.
9. Zachary, R. B., Holmes, W. *Surg. Gyn. Obstet.* 1946, 82, 632.

Annotations

DANGER FROM ICE-CREAM

Now that we have learned to keep sewage and drinking-water separate, it is time to take more care over keeping fæces out of food. The control of dysentery and the enteric diseases depends on teaching people to wash their hands after defæcation. In America much more is being done than in this country to educate food-handlers about personal cleanliness, but with certain foods additional precautions are needed.

Ice-cream is like milk in that it is a perfect bacteriological medium; but, unlike milk, it does not usually start off with a legacy of pathogenic organisms. Of the substances used in its manufacture, milk, dried egg, and possibly gelatin might contain pathogenic bacteria. Regulations laid down by the Minister of Health should do much to prevent the salmonella in dried egg from causing trouble, and as some form of heat is used in the preparation of most commercial ice-cream the danger from indigenous pathogens is further reduced. In the so-called cold-mix method there are dangers, though paradoxically they may be less than in the hot-mixes, where initial heating often destroys the bacteria present in the original mixture. The chief danger in all types of ice-cream manufacture lies in human contamination, either from dirty hands or from infected droplets coughed into the mixture before it is frozen. In a recent investigation of three outbreaks of staphylococcal food-poisoning caused by ice-cream G. S. Wilson and his colleagues,[1] at Oxford, showed that in all cases the contaminated food had been allowed to stand unfrozen for anything up to 30 hours after preparation. It is during this interval between preparation and freezing that pathogens introduced into a hot-mix find not only a perfect medium for growth but almost equally perfect temperature conditions for rapid multiplication. For this reason the hot-mix method is probably the most dangerous, and the Oxford workers recommended that after preparation ice-cream mix should be frozen almost immediately if pathogens or toxin-producing organisms are to be prevented from multiplying while the mix is slowly cooling down. The remedy, therefore, is some method of immediate cooling, and we are glad to hear that the Ministry of Health is considering compulsory pasteurisation for all types of ice-cream except that made by the cold-mix method. With such regulations in force there is little doubt that large outbreaks like that at Aberystwyth could be avoided.

There remains the problem of getting some workable and reliable method for the bacteriological control of ice-cream. A total bacterial count at 37° C gives some idea of bacteriological cleanliness; but the difficulties of this test may hinder its adoption, and there is need for further study. Many local authorities are also worried because a variety of watery mixtures, sold to the public as ice-cream, may be made in insanitary kitchens, and they seem to have little power to put matters right. The outbreak at Aberystwyth may serve a useful purpose if it forces public opinion to see that such things do not happen again.

CHEMOTHERAPY IN INFLUENZA

VIRUS infections, with the possible exceptions of trachoma, lymphogranuloma inguinale, and lymphocytic chorio-meningitis, do not respond to drugs of the sulphonamide group. The influenza virus is one of those against which no chemotherapeutic agent has yet proved effective. There is ample experimental and clinical evidence that sulphonamides and penicillin do not alter the course of uncomplicated influenza; but there is equally clear evidence that these drugs have a definite place in the treatment of secondary bacterial pulmonary conditions. Disagreement about their clinical value in influenza may have arisen for several reasons. With secondary bacterial pneumonia there is no way of judging the severity of the viral infection; and if death results, this is usually attributed to incapacity of sulphonamides to cure, whereas the lethal factor may have been not bacterial but viral. Moreover, sulphonamides are not always prescribed in sufficient doses. It is by no means rare for manifestations of inflammatory lung disease to persist, after a short course of chemotherapy, into convalescence; yet when a further, and full, course is given, the infection is controlled. Apparent failure of sulphonamides can often be traced to faults of technique in their exhibition.

Detailed investigation into the mechanism of the sulphonamides in combined infections with the influenza

---

1. Williams, G. C., Swift, S., Vollum, R. E., Wilson, G. S. *Month. Bull. Min. Hlth & E.P.H.L.S.* 1946, 5, 17

virus and bacteria have indicated that the severity of the viral process is unaffected by superimposed bacterial pneumonia.[1] Conversely, sulphonamides exert their antibacterial action even in the presence of a rapidly multiplying influenza virus and of extensive pulmonary exudate. This is probably because the virus, though destroying the ciliated cells of respiratory epithelium and so probably lowering resistance to bacterial invaders, does not interfere with the activity of the phagocytic cells which are important in chemotherapy. There is thus good reason for continuing to treat specifically the bacterial pneumonic complications of influenza. We may hope thereby to lower the risk of death, provided that the viral infection itself is not too severe. The white-cell count in conjunction with the clinical picture is sometimes a useful guide to the patients most likely to benefit from chemotherapy: leucopenia suggests that the infection is predominantly viral and not susceptible to this treatment, whereas a leucocytosis favours the chance of a good response.

JOURNALS OF THE BRITISH MEDICAL ASSOCIATION

We learn with regret that Dr. Gerald Horner is to retire at the end of this year from the editorial chair of the *British Medical Journal* which he has occupied with so much distinction since 1928. He will be succeeded by Dr. Hugh Clegg, the deputy editor. Meanwhile the staff of the journal has been brought up to peace-time strength by the return from the R.A.M.C. of Dr. Harvey Flack, assistant editor, and by the appointment of two new subeditors, Dr. E. G. Murphy and Dr. D. Swinscow. The responsibilities of the editor will be increased in January by the publication, under his general direction, of two important new journals, entitled *Abstracts of World Medicine* and *Abstracts of World Surgery, Obstetrics, and Gynæcology.* Brigadier G. W. M. Findlay, of the Wellcome Research Institution, will edit them, with the assistance of Dr. S. S. B. Gilder, who as prisoner-of-war in Germany acquired varied surgical experience and a knowledge of various languages.

Of the association's specialist journals the *Archives of Disease in Childhood* (which now incorporates the *British Journal of Children's Diseases*) is edited by Dr. Richard Ellis, newly elected professor of child health in the University of Edinburgh; the *Journal of Neurology, Neurosurgery, and Psychiatry* by Dr. E. A. Carmichael; and the *British Heart Journal* by Dr. Maurice Campbell and Dr. Evan Bedford—the last being published with the Cardiac Society. The *British Journal of Industrial Medicine*, with Dr. Donald Hunter as editor, is produced in conjunction with the Association of Industrial Medical Officers, and the *Annals of Rheumatic Diseases*, in charge of Dr. C. W. Buckley, with the Empire Rheumatism Council. The latest additions to the list are the *British Journal of Pharmacology and Chemotherapy*, with Prof. J. H. Gaddum, F.R.S., as chairman of the editorial committee, published quarterly with the British Pharmacological Society, and *Thorax*, edited by Mr. N. R. Barrett and Dr. J. G. Scadding, published with the Association for Study of Diseases of the Chest. The *British Journal of Social Medicine*, under the editorship of Prof. F. A. E. Crew, F.R.S., and Prof. Lancelot Hogben, F.R.S., is to come out in the New Year.

In the secretariat of the B.M.A. Dr. Charles Hill has Dr. A. Macrae and Dr. L. S. Potter as his assistants. To these have now been added Dr. E. Claxton, of Sutton Coldfield, and Lieut.-Colonel D. P. Stevenson, R.A.M.C., while Dr. Agnes Kelynack, a temporary assistant secretary since 1944, has joined the permanent staff. Dr. E. R. C. Walker has lately been appointed Scottish secretary in succession to Dr. R. W. Craig, and Mr. John Pringle, deputy editor of the *Listener*, has become press officer to the association.

---

[1] Harford, C. G., Smith, M. R., Wood, W. B. *J. exp. Med.* 1946, 83, 505.

TUBERCULOSIS IN THE COLONIES

Tuberculosis is now widespread among many peoples to whom it was formerly almost unknown—notably the Africans and American negroes, the West Indians, the Malayans, and the Indians. A vivid impression of its ravages is obtained from a summary compiled by Prof. S. Lyle Cummins,[1] a pioneer and life-long student of the subject. Much of the monograph is devoted to an account of work by many different investigators in Africa, but there are references to Cyprus, India, Burma, the United States, and the West Indies.

The picture which emerges is gloomy. Africans are hypersensitive to the tubercle bacillus, with so little control of infection that manual work in the gold-mines breaks down their unstable defences, and with so little resistance to overt pulmonary tuberculosis that recovery, even in the restricted sense applied in Britain, is rare. At one end of the scale of susceptibility are the Senegalese soldiers in France during the war of 1914–18, carefully observed by Borrel,[2] who were taken to an infective environment from their own country, in which tuberculosis was almost absent, and who died in great numbers of a disease they could not defeat; the form was the acute generalised tuberculosis found characteristically in European infants and susceptible laboratory animals. Those who survived were probably rather more resistant than those who died, and natural selection would therefore operate towards the breeding of a race with rather higher resistance. At the other end of the scale are the negroes of the United States, whose death-rate, though still higher than that of whites, is decreasing with the general fall. In these negroes natural selection is further advanced, and the race is relatively resistant. Between the Senegalese and the American negroes lie the mass of indigenous Africans, more susceptible than the Europeans and increasingly subject to infection. That the majority of Africans control primary infection is proved by the observation that most surviving adults are positive to tuberculin but are not diseased; but it is equally true that a far greater proportion of Africans than of Europeans fail to control primary infection, become diseased, and die.

The gravity of the position, especially in urban communities, has been recognised by the government of Tanganyika Territory, who have lately decided to extend the tuberculosis organisation directed for the past twenty years by Dr. H. N. Davies at Kibongoto.[3] It was also recognised by the medical services in the late war, as Cullinan [4] has indicated. The incidence of the disease is not, of course, determined solely by susceptibility of the community; on this basis the high rates constantly found in the Royal Navy [5] would be inexplicable. Environment, especially opportunity for close contact (as in the Navy), malnutrition (as at Belsen), and unfavourable conditions of work (as in African gold-mines), is the other obvious factor.

More knowledge is needed; but in the meantime tuberculosis is a pressing human and social problem, and the question is always, what is to be done? Inaction might in time provide a partial solution, by breeding out the susceptibles; but to accept such a measure of despair would be indefensible. Extensive social measures e required if the disease is to be checked. Opportunity r infection must be reduced by social, educational, and onomic means; malnutrition by agricultural reform and nproved distribution; and conditions of work by legis- tion and enlightenment. Of the more direct methods, nmunisation by B.C.G. or other vaccines needs early rial; the memorandum recently prepared by Prof. V. H. Tytler for the National Association for the revention of Tuberculosis[6] encourages the hope that .C.G. could be used effectively in the tropics; and the iscovery by Russian workers[7] that the vaccine may be ept for long periods in the dry frozen state may remove he major administrative disabilities of present schemes or its use.

---

[1] Cummins, S. L. Empire and Colonial Tuberculosis: a General Survey of the Problem. London: National Association for the Prevention of Tuberculosis. Pp. 59. 5s.
[2] Borrel, A. *Ann. Inst. Pasteur,* 1920, 34, 105.
[3] *Tanganyika Standard,* June 15, 1946.
[4] Cullinan, E. R. *Trans. R. Soc. trop. Med. Hyg.* 1946, 39, 353.
[5] *R. Nav. med. Bull.* 1945, no. 20, p. 1.

In treatment, the standard procedures have sometimes roved disappointing in the tropics, because primitive eoples do not yet understand the importance of long- ontinued care. But this should not discourage their pplication, under the best conditions possible.

STYPTIC FROM SEAWEED

WHEN seaweed is broken in the sea the injury is healed by contact of the plant juices with the calcium ions of the water. The substance responsible is alginic acid, which is a polymer of *d*-mannuronic acid and resembles cellulose in chemical structure. Alginic acid salts are used in industry as thickening and binding agents, and fine filaments and foams can be produced; the usual source is an extract of the seaweed *Laminaria digitata*, and sodium and calcium salts are the important forms. Sodium alginate solution can be sterilised by autoclaving. When applied to raw tissue surfaces, it reacts immediately with the ionised calcium, to form a clot or layer of calcium alginate; this material acts as a styptic, and has the advantages that it is absorbable, has no deleterious action on the surrounding tissues, and, so far as is known, does not interfere with the action of drugs like penicillin; moreover, dilution with plasma does not interfere with the formation of calcium alginate. Another method is to prepare calcium alginate by adding to sodium alginate solution a soluble calcium salt to produce thin films in situ; or a foam or plastic sheet can be prepared. Calcium alginate filaments can be prepared as an absorbable hæmostatic gauze for application to oozing surfaces. Blaine, Dollar, and Sorsby[8] have described the use of calcium alginate in scleral wounds, but consider that in this site it compares unfavourably with fibrinogen. Smith[9] has reported good results with powdered alginic acid as a styptic, after tooth-extraction and other minor surgical procedures in the mouth. It is evident that these alginate products will be a useful alternative to the other absorbable hæmostatics or fixatives that have been developed during the war.

Fibrinogen is used to form fibrin films for the arrest of hæmorrhage, and it can be employed as a fixative in plastic surgery; it is, however, expensive and cannot be heat-sterilised. Oxidised cellulose gauze swells and becomes sticky when blood-soaked, and it does not depend for its action on the clotting of blood within the meshes; it is absorbable and is not invaded by fibroblasts, so that scarring is minimal.[10] Here, too, heat cannot be used for sterilisation, which is usually effected by immersion in formalin. Alginates, on the other hand, are relatively cheap, and can be sterilised by heat; gauzes of various absorption rates can be manufactured, and the starting material—sodium alginate—is stable. There is evidence that clots of calcium alginate are invaded by fibroblasts, but its action on scar tissue has not yet been described. When supplies become more plentiful, it will be interesting to see whether it can be used in hæmorrhagic diseases, such as hæmophilia, and to control oral hæmorrhage after tooth-extraction, especially since snake venoms have proved on the whole disappointing.

---

[6] See *Lancet*, July 27, p. 138.

[7] Leschinskaya, E. N. *Amer. Rev. Soviet Med.* 1946, 3, 210. Cited by Tytler, W. H. *Lancet*, August 3, p. 180.

[8] Blaine, G., Dollar, M., Sorsby, A. *Trans. Ophthal. Soc. U.K.* 1944, 64, 187.

[9] Smith, C. A. H. *Science*, 1946, 103, 634.

[10] Frantz, V. K., Clarke, H. T. *Ann. Surg.* 1944, 120, 181.

H. G. WELLS

A LATTER-DAY prophet, Wells increased our perception of the past, the present, and the future. Many of his ideas are now part of our mental daily life, while the central theme of his teaching has begun to sound like a platitude. He believed in education as the only hope of giving men control over themselves and hence of their own inventions. "The conviction grew continually stronger with him that man must order himself as a political animal or perish," and "every effort of his multifarious writing became consolidated upon emphasising the necessity that nations should sacrifice some part of their sovereign rights in the creation of a world State."[1] His first book was a manual of biology, and from the imaginative tales which opened so many peoples' minds to the possibilities of science he turned to novels which became more and more frankly sociological. His supreme effort in direct education was made after the first world war, when with collaborators he produced the trilogy, *The Outline of History*, *The Science of Life*, and *The Work, Wealth, and Happiness of Mankind*. His *Shape of Things to Come* was another arresting work, and was translated to millions through the cinema. As he grew old his propaganda became less effective, partly because it was more explicit; but what is more astonishing is that his spirit remained so ardent in flesh so frail. His last work, *Mind at the End of Its Tether*, refers to a familial fatty degeneration of the heart which ended the lives of his forebears and was one of the "complications" of his own "never very sound body"; he was also, one gathers, a diabetic; and in early years it was tuberculosis that diverted him from teaching to writing. The life lived apparently by a man of outstanding physical vigour and tireless energy, and extending to 79 years, was thus handicapped by at least two serious ailments.

To judge the place of Wells in the life of his time it is necessary, as the *Times* says, "to retrace the years and to recall the responses of successive generations to the intellectual challenges he hurled at them. Beyond all question he gave stimulus after stimulus to thought. The flushing torrent of his ideas left . . . few tranquil pools for the reflective reader. Yet as an urgent and genuine seeker after truth he must have persuaded multitudes to join him in his quest."[2] The interpreter of evolution was in fact a great leader of men, and his message was as important as he supposed.

Dr. OTTO MAY, chairman of the British Social Hygiene Council, and until his retirement principal medical officer of the Prudential Assurance Company, died on August 15 at the age of 67.

---

[1] *Manchester Guardian*, August 14, p. 4.

[2] *Times*, August 14, p. 5.

TRAFFIC IN DANGEROUS DRUGS.—The Advisory Committee on Traffic in Opium and other Dangerous Drugs has resumed the issue of summaries of illicit transactions and seizures of narcotics, which has been delayed during the war years. The summaries for the years 1942–45 deal with seizures of raw opium, prepared opium, morphine, heroin, cocaine, and indian hemp, and cover Europe, Asia, Africa, America, and Australia. The report bears testimony to vigilance on behalf of world-wide administrations in tracking out centres of illicit manufacture and exposing clandestine traffic in habit-forming drugs. It is interesting to note that indian hemp, in the form of hashish, was seized in considerable quantities in Egypt, and in the form of marihuana cigarettes in North and South America, while Palestine also was not immune from illicit traffic. In 1942 4689 kg. of hashish in all were seized in addition to marihuana, as such, and in cigars and cigarettes.

Special Articles

ADVERTISING PATENT MEDICINES

J. W. P. THOMPSON
M.B. Camb., D.P.H.
DEPUTY COUNTY MEDICAL OFFICER, DORSET

THE *medical profession has not* been backward in calling attention to the obvious barriers which prevent large numbers of people from attaining full health, but there are less conspicuous obstructions which deserve more attention than they have received. One of these is the false learning unavoidably imbibed by the public from patent-medicine advertisements.

For many years past considerable concern has been expressed about the methods adopted by the manufacturers of patent medicines to sell their wares, and about the gullibility of the public who repay the manufacturers so handsomely for their expenditure on propaganda. An estimate of the extent to which the public drug themselves with advertised products was published by Davies (1944). My object here is to provide further ammunition for those who wish to draw attention to the less desirable aspects of this trade. It should be clear from the start that what is criticised is not the patent medicines, however much some of them may deserve criticism, but the advertisements which tend to give the public so many misleading ideas.

The scope of the present investigation was not large. It consisted merely in an analysis in detail of the advertisements appearing in two consecutive issues of a weekly provincial newspaper. About 40% of its space is taken up by news and 60% by advertisements, including the usual small advertisement section and the advertisements officially sponsored by Government departments.

The space taken by patent-medicine advertisements was 10% of the total printed matter, or a quarter of the space given to news. Excluding the space taken by Government departments, 25% of the total advertising space was taken by advertisements of patent medicines and ointments. The advertisements of ointments, though less numerous, are often as misleading as the advertisements of patent medicines. They will not be referred to again, as they were not included in this investigation.

The patent-medicine space was about equal to the total space taken by seven separate Government departments, and ten times greater than the space taken by the Ministry of Food—the only department offering useful advice to the public on subjects related to health. No space was taken by the Ministry of Health.

ANALYSIS OF ADVERTISEMENTS

In all, twenty patent medicines were advertised. Eight of these were given space in both issues of the paper, making a total of twenty-eight separate advertisements. The indications for self-medication given in these advertisements numbered 69, which gives an average of between 3 and 4 indications per product. The average does not give a *true* picture, as one manufacturer lists 21 indications for his medicine (a laxative), and another, more ethical, prints no indications for his salts, but states unequivocally that they are necessary for health. The variety in the number of indications for the various products was as follows :—

Products	*No. of indications*	*Products*	*No. of indications*
1	0	2	7
3	1	2	9
4	2	2	10
1	3	1	19
1	4	1	21
2	5		

Of the products which rely on 1 indication only, claim is made for the first to cure obesity, the second constipation, and the third *limping*. It is not surprising that the third is described as a wonder tablet. Of the 69 indications, 40 appeared only once, 16 twice, 4 three times, 5 four times, 2 five times, and 1 six times. Needless to say, the indication which appeared six times was constipation. Bracketed for second place in popularity came headaches and joint pains. Indigestion, muscular pains, rheumatic pains, and lumbago shared third place, while backache, neuralgia, and acidity came in fourth. It is impracticable to mention all the also-rans, but among the more outstanding were gasping, choking, intestinal ulceration and fermentation (apparently regarded as equally serious), asthma, nerviness, dizziness, depression, sleeplessness, blurred vision, bloodshot eyes, pimples, stomach pain, morning sickness, colds, influenza, hay fever, sciatica, gout, irritability, urinary troubles, bladder troubles, gravel, fretfulness, boils, cramp, eczema, rashes, ulcers, and varicose legs.

Pain of one sort or another is mentioned forty times in these advertisements, whereas the varieties of symptoms which may be grouped under the term "indigestion" obtain only twenty-two mentions. *A further* eight indications cover intestinal complaints *other than* indigestion—from bad breath to piles.

Of *the* 20 *medicines advertised*, 9 are laxatives, 4 analgesics, 3 anti-indigestion remedies, and the remaining 4 are for coughs, kidneys, blood impurities, and vascular disorders.

I have classified the advertisements into four groups :—

	Products
(1) Dangerously misleading in at least one respect ..	5
(2) Misleading, and possibly harmful	8
(3) Not definitely misleading, but excessively optimistic	2
(4) Probably useful for the purpose indicated ..	5

Of the 13 products in groups (1) and (2) 5 are laxatives, 2 analgesics, 2 anti-indigestion medicines, 1 a cough medicine, 1 a blood tonic, 1 a medicine for the kidneys, and 1 a medicine for vascular disorders.

Advertisements in Group (1).—It surely cannot be considered other than dangerously *misleading to* inform the public that the fight against asthma can be won with one sure blow, and that normal breathing returns and *distress vanishes after taking a particular nostrum*. It is equally misleading to claim that an analgesic can *banish influenza overnight, and that it* strikes deep at the underlying causes of pain and illness. It is certainly far from advisable for the public to put their faith in tablets which are said to strengthen and flush out the kidneys and should on that account be used for urinary and bladder troubles, gravel, and scanty or too frequent urine. Finally, I have included in this group those advertisements which claim that *intestinal* ulceration can be cured or alleviated by the products concerned. One of the advertisers in this group emphasises that his preparation, which is described as a modern remedy, is available to all without prescription, thereby implying that the advice of a doctor for a serious complaint not necessary.

Advertisements in Group (2).—*The following* exhortations occur in the 8 advertisements I have included in group (2) :—

"Beat indigestion anytime and everytime it strikes . . . with fifteen indigestion-taming ingredients."

"Throw poisons out of the system . . . generous formula deals with all the ills that put people off the job."

"*Look to your nerves*" (a nerve-building medicine recommended for neuritis).

"*Slim while you sleep.*"

"Remove blood impurities—root cause of blood and skin complaints."

"*Cool* and cleanse the blood-stream from teething-time to fourteen years."

"Stop limping."

"Wake up your liver bile."

EXTENT OF SELF-MEDICATION

A study of the advertisements gives no indication of the extent to which the public buy and use these products. In his inquiry in Bristol Davies (1944) discovered that practically 75% of the persons questioned were taking medicines other than under medical advice. Those taking laxatives and those taking analgesics were about equal. This is not out of line with the relative amount of advertising space taken by these two types of product, as, though more laxatives are advertised, the analgesics are, on the whole, given more forceful copy. What is surprising is that comparatively few of the persons questioned in Bristol were taking anti-indigestion medicines, which have nearly as much advertising space as the analgesics and are given equally forceful boosts. It is not so surprising that few "preventives" (vitamins, iron, &c.) were being taken, as these potentially useful preparations get very little advertising space compared with the three big groups of patent medicines.

COST OF PATENT-MEDICINE ADVERTISEMENTS

In 1938 the estimated cost of advertising patent medicines in the press was £3,692,856 (Bishop 1944). This figure is 11% of the total cost of all newspaper advertisements. It is greater than the amount spent on any other individual group of products, except foodstuffs, which exceed it by a mere £200,000. By far the largest proportion of the expenditure on advertising foodstuffs was in connexion with health and baby foods, some of which are advertised as though they were patent medicines. The amount spent on advertising alcoholic drinks was only a third of that spent on patent medicines, and on cigarettes less than half.

Analysis of the expenditure on patent-medicine advertisements shows that laxatives lead the field with £650,000. Indigestion remedies cost £370,000, and aspirin and pain-cures £360,000.

Expressed as a percentage of total retail sales, the advertising cost of the group of products in which patent medicines are placed was 34%—by far the most expensive advertising. The figure for foodstuffs was 0·86%. A comparison of advertising and production costs for patent medicines does not appear to be available. It might be interesting if it were.

In 1938 the total sum spent on dispensing National Health Insurance prescriptions and appliances was £2,660,850—i.e., two-thirds of the sum spent on advertising patent medicines.

CONTROL OF PATENT-MEDICINE ADVERTISEMENTS

Under the Venereal Disease Act, 1917, the advertising of medicines for the treatment of venereal diseases is prohibited. The Cancer Act, 1939, prohibits the advertising of medicines for cancer. Under the Pharmacy and Medicines Act, 1941, advertisements of remedies for the following diseases are prohibited: Bright's disease, cataract, diabetes, epilepsy or fits, glaucoma, locomotor ataxy, paralysis, and tuberculosis. The advertising of abortifacients is also prohibited under this Act.

Section 6 of the Food and Drugs Act, 1938, lays down that a person who publishes an advertisement which falsely describes any drug, or is otherwise calculated to mislead as to its nature, substance, or quality, shall be guilty of an offence. Under the Defence (Sale of Food) Regulations, 1943, it is also an offence to publish an advertisement which misleads as to the nutritional or dietary value of a food; and, according to the Food and Drugs Act, 1938, an article shall not be deemed not to be a food by reason only that it can also be used as a medicine.

Many manufacturers of patent medicines are members of the Proprietary Association of Great Britain, which has issued a code of rules for advertising. One of the objects of the rules is to ensure that advertisements are of such a character that they do not mislead the public or contain statements which would permit criticisms to be levelled at proprietary medicines as a whole, or which may cause public confidence in proprietary medicines to be impaired (Chapman 1942). This code of rules was in force for some years before the passing of the Pharmacy and Medicines Act, 1941, and in some respects the rules are in advance of the law. It would be interesting to know which manufacturers are members of the association, so that their advertisements could be compared with those of the non-members.

The Ministry of Food, in consultation with the Medical Research Council, has drawn up for food manufacturers a suggested code of practice in framing labels and advertisements. Among other recommendations the following advice is given about claims connected with the vitamin or mineral content of a food: "Unless the amount of the food that would ordinarily be consumed in one day contains at least one full daily requirement of the vitamin or mineral, no reference is justified to the value of the food for the prevention or cure of disease due to the lack of the vitamin or mineral present in the food."

As a further check on the publication of misleading advertisements, the Newspaper Proprietors' Association adopted certain rules about the acceptance of proprietary-medicine advertisements by newspapers represented in the N.P.A. (*British Medical Journal* 1943). The rules appear to be closely related to the Proprietary Association's code. Possibly not all newspapers are bound by these rules. Certainly misleading advertisements continue to appear.

DISCUSSION

In this country the sale of drugs and medicines of all kinds has been an open trade. It is only since 1868 that the sale of poisons has been controlled. The advertising and sale of patent medicines were the subject of inquiry by a select committee in 1912. The concluding paragraph of their report was as follows:—

> "For all practical purposes British law is powerless to prevent any person from procuring any drugs or making any mixture, whether patent or without any therapeutical activity whatever (so long as it does not contain a scheduled poison), advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians, and selling it under any name he chooses—on the payment of a small stamp duty—for any prices he can persuade a credulous public to pay."

The law has been strengthened since then, but it is not nearly so effective as it might have been, had Dr. Addison's Proprietary Medicines Bill not been withdrawn from Parliament in 1920. In this Bill provision was made for the establishment of a register of proprietary medicines, and the sale of unregistered medicines was to be prohibited. The Minister of Health was to have been empowered to remove from the register any injurious medicine or appliance.

Possibly another attempt should be made to strengthen the law regarding the manufacture and sale of patent medicines, as it is perhaps over-optimistic to expect that good sense and good taste will eventually prevail over prejudice and ignorance. In so far as the control of misleading advertisements is concerned, it seems that section 6 of the Food and Drugs Act, 1938, gives power to take effective action, though the legal difficulties in the way of bringing a prosecution to a successful conclusion would be formidable.

In some other countries the interests of public health take precedence in cases where they may be in conflict with commercial speculation. The Proprietary or Patent Medicine Act of Canada states:—

> "No proprietary or patent medicine shall be manufactured, imported, exposed, or offered for sale or sold in Canada if the

article be represented as a cure for any disease, or if any false, misleading, or exaggerated claims be made on the wrapper or label, or in any advertisement of the article."

This country is peculiar in that there is a widely held belief that a bottle of medicine is something no healthy person should be without. This trust in medicines is not a new thing. Oliver Goldsmith wrote :—

> "The English are peculiarly excellent in the art of healing. There is scarcely a disorder against which they are not possessed of an infallible antidote. The advertising professors here delight in cases of difficulty. You will find numbers in every street, who, by levelling a pill at the part affected, promise a certain cure."

Though it must be agreed that the cost of persuading members of the public to buy patent medicines is out of all proportion to the good these preparations may do, the point of view put forward by Bishop (1944) would probably obtain considerable popular support :

> "The consumer may not always appear to choose very wisely, but perhaps he would prefer to risk mistakes and occasional deception in the exercise of his own free choice rather than submit in the matter of his daily purchases to the judgment of some central authority, however wise and benevolent."

There is no getting over the fact, however, that the wording of some advertisements is deliberately misleading. This would not matter much if the public were reasonably well informed, but unfortunately the public appear to be both gullible and ignorant. The defence of an advertising expert is worth quoting in full :—

> "People are very rarely misled by advertisements except when they wish to be misled. And few advertisements, in spite of all appearances to the contrary, are really intended to mislead. There is a robust and saving common sense, and a humour and proportion about the ordinary consumer which are better understood by those who seek his custom than by those who are so anxious to protect him against himself. Of course freedom is dangerous, and free competitive advertising is strong meat, not always easily digestible by delicate stomachs. For that reason it is rightly to be regarded with caution, and used with a sense of responsibility. But freedom to persuade, in economic as in religious or political matters, is the right food for a free society. Its benefits certainly cannot be measured in pounds, shillings, and pence." (Bishop 1944.)

It may be the view of some that newspaper advertisements are harmless because few if any people bother to read them. Those who doubt the power and influence of advertising perhaps do not realise the extent to which manufacturers rely on advertisements to increase sales. Messrs. J. Lyons and Co. Ltd. have revealed that, before they started advertising their swiss rolls on a big scale, they were selling 10,000 a week. Shortly after advertising began the sales rose to 600,000 a week.

Short of a compulsory censorship of advertisements—a procedure which should be unnecessary in any country where the public is well informed—what can be done to counteract the harmful advertisements? These presumably take the form they do because the manufacturers are unable to agree that their advertisements should be consistent with modern pharmacological and medical knowledge—admittedly this might lead to a great loss of trade—and because newspaper proprietors do not always insist on every patent-medicine advertisement being scrutinised by a reputable medical authority.

Perhaps the most promising lines of attack would be (1) for general practitioners to talk over with their patients the question of self-medication with patent medicines; and (2) for some public body to insert health advertisements in the newspapers as a direct counterblast to the patent-medicine manufacturer. Possibly the advertising space now taken to enlighten the public about venereal disease might with advantage be used occasionally for a short homily on the treatment of constipation. By these means the public might gradually be weaned from their belief that most patent medicines are a kind of cocktail for making life tolerable in these times.

SUMMARY

The advertisements of patent medicines appearing in two consecutive issues of a weekly provincial newspaper are analysed.

The cost of patent-medicine advertisements and the control at present exercised over such advertising are discussed.

The conclusion is reached that many advertisements are misleading, and suggestions are made for counteracting the harm done by them.

REFERENCES

Bishop, F. P. (1944) The Economics of Advertising, London.
British Medical Journal (1943) ii, 462.
Chapman, H. E. (1942) The Law Relating to the Marketing and Sale of Medicines, London.
Davies, J. N. P. (1944) *Brit. med. J.* ii, 87.

MUNICIPAL SPECIALIST SERVICE

THE BRISTOL SCHEME

IN 1938 the Bristol city council adopted a new policy for the employment of specialists at their hospitals and health centres. Till then specialists had been engaged for specific duties and paid on a sessional basis or by honorarium based on the usual sessional rate of payment. Under the new scheme surgeons, physicians, and obstetricians and gynæcologists have worked as teams under the directorship of the university professor of their group. Three or four teams were organised in each group, and a sum of money was paid to the professor for distribution between the members of his teams according to services rendered. One of the conditions was that the teams should meet regularly as a committee at the municipal hospital and make suggestions for the improvement and development of the services, and the many useful recommendations made at these meetings have been appreciated by the administrative staff of the public-health department.

This scheme, which has many advantages, has worked well in spite of the war, which reduced the number of consultants and increased their work. But now the expansion of the service is demanded by the needs of a comprehensive school medical service, of health centres, and of an E.M.S. hospital recently taken over by the city. At the same time the university has had to reorganise its medical teaching so as to train more specialists, and this will decrease the number of teaching staff available for treatment of patients, while the professors of the medical faculty will be less able to take part in the supervision of corporation services.

A joint advisory committee, on which the city council, the university, and voluntary hospitals were represented, was therefore constituted to consider appointments to hospitals and health-centre staffs. The medical faculty of the Royal Hospital suggested certain general principles for the organisation of the specialist services in the city hospitals, voluntary and municipal, which the joint committee accepted in the following form :

(*a*) The consultants and other medical personnel should be organised into units to which the work would be allocated.

(*b*) Each unit should be the clinical team, which normally should consist of two members of the visiting staff (preferably a senior and a junior), a registrar, and a house-officer, with or without clinical assistants.

(*c*) Where the work of a department or specialty is greater than can be dealt with by one unit, and a second unit is created, each unit should be equal in status.

(*d*) University professors and heads of departments should be in general charge of teaching, but each team should be entirely responsible for its clinical work.

(*e*) Registrars should be appointed as members of a team and not to a department.

(*f*) Outpatient consulting sessions should be held at the Royal Hospital by all the teams. The members of all teams should be on the Royal Hospital medical staff, irrespective of whether they have beds in the hospital.

(*g*) The beds allocated to a team should be, as far as possible, in one hospital.

Last month the city council approved a report based on these principles for the staffing of its municipal hospitals and health centres. The cost of specialist services to the corporation when this scheme comes into full operation will be £22,000 per annum—a yearly increase of about £11,000.

HOMŒOPATHY AND THE BILL

Mr. Aneurin Bevan, the Minister of Health, with Dr. J. A. Charles and Mr. J. M. K. Hawton received a deputation on June 27 from the British Homœopathic Association, which included Dr. Alva Benjamin, Sir John Weir, M.B., and Dr. W. Lees Templeton. The deputation said that many people in all parts of the country wished to have homœopathic treatment, which should therefore be provided for them under the National Health Service. To ensure that this demand was adequately met they asked that certain homœopathic hospitals should be designated as teaching hospitals under the Bill, and that the homœopathic doctor should not be debarred from practice in an area on the grounds that there was already a sufficiency of non-homœopathic doctors.

In reply, Mr. Bevan said he hoped that the homœopathic hospitals, in general, would come into the National Health Service scheme, and he would try to preserve their special character and atmosphere, like that of other special types of hospital, by making suitable appointments to the management committees, &c. He thought, however, that the regional hospital boards would have to look at the services in any given area before a conclusion could be arrived at about any particular hospital. He could not give any assurance as regards designating homœopathic hospitals as teaching hospitals; it was not his function to determine what kind of training was to be given in teaching hospitals, and the university authorities must come into this question. There would be no discrimination against homœopathic methods of practice; equally, of course, there would be no discrimination in favour of them, or of any other particular clinical methods.

Many of these problems, the Minister added, might ot prove so formidable in practice as they might seem ı theory, and he would gladly ask the association to eet him again at a later stage when the preparations ere being made to bring the Act into operation.

On Active Service

AWARDS

The following awards have been made in recognition f gallant and distinguished services in the Far East:

C.B.E.

Brigadier C. H. Stringer, D.S.O., O.B.E., L.R.C.P.I., late R.A.M.C.

O.B.E.

Lieut.-Colonel D. C. Chopra, M.B., I.M.S. (since died).

M.B.E.

Major S. M. Banfill, R.C.A.M.C.
Major J. N. B. Crawford, R.C.A.M.C.
Major C. W. Maisey, M.R.C.S., R.A.M.C.
Major J. A. G. Reid, R.C.A.M.C.

MENTIONED IN DESPATCHES

COMMANDS AND STAFF

Colonels.—E. Percival, D.S.O., M.C., late R.A.M.C.; V. H. Wardle, M.C., late R.A.M.C.

R.A.M.C.

Brigadier D. S. Middleton.
Colonels.—J. Bennet, J. Taylor, O.B.E.
Lieut.-Colonels.—J. W. Craven, M.C., W. G. Harvey.
Majors.—H. M. S. G. Beadnell, M.B.E., P. R. Graves, M.B.E., H. Henderson.
Captains.—J. E. A. Bartlett, M. H. Churchill, T. R. S. Cormack, E. K. Cruickshank, J. G. Jesson, W. H. McDonald, J. A. Mark, T. B. Smiley, M.C., R. B. C. Welsh.

R.C.A.M.C.

Major G. C. Gray.

The President of the United States has conferred the degree of officer in the Legion of Merit on Major-General Sir Edward Phillips, K.B.E., C.B., D.S.O., M.C., M.B., late R.A.M.C., and the bronze star medal on Colonel Thomas Parr, M.D., R.A.M.C.

In England Now

A Running Commentary by Peripatetic Correspondents

You will remember King Aethelbeorht (the vulgar call him Ethelbert), who married Bertha, and received St. Augustine under an oak tree, and became the first Christian king of England. Well, they had Laws even in those days, and I want to call the attention of Mr. Paling, Minister of Pensions, to their excellence. For example, Aethelbeorht says that "if the eye and foot of a servant are destroyed by wounds his full value shall be paid." The Ministry, allowing for the difference of outlook in so many hundred years, says much the same thing, but you have to lose the eye and a leg above the knee to be sure of 100%. Of course, the comparison between Aethelbeorht and Mr. Paling is not perfect. Aethelbeorht is talking about single payments in cash or cows while Mr. Paling is concerned with weekly payments. But we can make some sort of comparison. Here are some of the things for which compensation of 12*s.* was due in A.D. 600—if an ear is struck off, if the power of speech is injured, if the belly is wounded, if the thigh is broken. That was Aethelbeorht's code. Now look at Mr. Paling's. Loss of an ear 7% only, but complete loss of speech would probably be 100%, and abdominal wounds and thigh fractures would be judged upon the amount of disablement produced. The comparison is in favour of Mr. Paling, and Aethelbeorht appears rather stolid and unimaginative.

On the other hand his Laws did, in other directions, imagine ways of incurring a 12*s.* compensation which would shock Mr. Paling's department. Thus 12*s.* was the proper compensation payable (I expect the King and his relatives shared it) for excessive attachment to a widow, that is, if she was of the third class: a second-class widow cost the offender 20*s.* If the lady was married, and her husband alive, the freeman involved must buy the wife from her husband, and then provide him with a new wife at whatever it might cost him. This seems rather hard upon the husband who was thus deprived of the sanctions of the unwritten law. He might not indulge in physical retaliation, for "if one man strikes another on the nose with his fist" 3*s.* compensation was payable, and if the hæmorrhagic nose was carried to a doctor for treatment a further 30*s.* had to be paid. This argues that the medical treatment of Aethelbeorht's day was not to be lightly borne or, perhaps, that the doctors were so skilled that they were worth a fee of what, in modern money, would certainly be at least £50.

Mr. Bevan ought to be told about this. He is a Progressive (or a backslider, everything depends upon the point of view) and now he is offering a paltry 12*s.* 6*d.* for a whole year's treatment while Aethelbeorht lays it down that we ought to have £50 for treating an epistatic nose, or ought it to be "epistasic"? It is true that Aethelbeorht was a mere Anglo-Saxon, while Mr. Bevan is an obvious Celt, but even Celtic doctors were better paid than we are going to be. For example, for treating a bishop the Celtic doctor could expect a fee of 40 cows, and even a slave was worth 2 cows, or the equivalent in sheep or goats. There are no slaves here nowadays and every man is as good as a bishop, or better. It is abundantly evident that we ought to have at least a capitation fee of 40 cows, according to the Brehon code, which was probably just as much Welsh as Irish, although St. Patrick seems to be mixed up with it somehow. So let us face this upstart Welshman with cries of "back to Aethelbeorht" and "give us our cows."

* * *

Like me, they had obviously come over to Yarmouth for the day. It was late afternoon, and Father, Mother, and Auntie had had enough of it. Three-year-old Binkie, weary and fractious, was lagging behind. Mother turned and spoke sharply to him—"Binkie, if you don't something-or-other I shall something-else; you see if I don't." With the time-stopping sensation of *déjà vu* I knew exactly what was going to happen next: and it did. Binkie tottered forward wildly to catch up, tripped, fell, and lay prone, bellowing to high heaven for comfort and sympathy. Mother, torn between conflicting emotions, jerked him up, petted him, dusted his clothes roughly, wiped his face gently, chid him, and gave him to Father to carry.

intense headache and backache, and all other prodromal symptoms may be present, including erythematous or petechial eruptions . . . its true nature is shown by its occurrence in an epidemic focus and by the sudden termination of the disease on the third day before the appearance of the papular eruption. Such cases are apt to be encountered among recently vaccinated persons shortly after joining the staff of a smallpox hospital, and several examples have lately been reported among recently vaccinated soldiers (Vorpahl, Klaholt, Kathe)."

Harries and Mitman (1940) describe variola sine eruptione as " smallpox confined to the initial toxæmia occurs in the previously vaccinated. . . . Occasionally a few small and atypical focal lesions may appear and be possibly overlooked."

In view of the so-called abortive case in this outbreak and the extracts quoted above, it seems reasonable to conclude that such cases may show some or all of the prodromal signs and symptoms of smallpox, and that these then fade out without any appearance of the true rash. We suggest that abortive smallpox would be a better and simpler name for the conditions previously described as variola sine eruptione, variola sine variolis, and contact disease.

VACCINATION OF CONTACTS

The present outbreak led to a considerable demand for vaccination. The contacts of H. R. were numerous, and many of them unknown; and A. R., during the first three days of his illness, had attended church services, a Sunday school, a wedding, and a technical school. Vaccination was offered to all known contacts, and a special vaccination session for children was held in the technical school. The public vaccinators were hard pressed, because, besides ordinary contacts, all laundries, libraries, and salvage-collecting personnel were warned. By Feb. 23 the list of known contacts exceeded 1000, and assistance was given by the county medical and nursing staffs.

On March 3 it was decided to open special vaccination centres. Up to this time all contacts had been vaccinated at the public vaccinators' surgeries (except the special clinic held for school-children). By March 9 five centres had been opened. These were greatly appreciated, as the weather had been particularly bad and there had been long queues standing in rain and snow outside the doctors' surgeries. In the five days March 4–9, 15,000 vaccinations were performed in the district. The assistance given by the Government Lymph Establishment at Colindale Avenue, London, N.W.9, was greatly appreciated.

On the whole, everything worked well, yet experience showed where improvements might have been possible. After the first few days it was realised that it would not be possible to reinspect all vaccinated contacts; so the public were informed that the only people who would be seen again a week after their vaccinations were (1) those who had been vaccinated for the first time and whose vaccination had not taken; (2) all infants under the age of one year (for vaccination certificates); and (3) all persons vaccinated by private doctors. The vaccinators by this time consisted of public vaccinators, other practitioners, medical officers on the staffs of health departments, and medical students working under supervision. It was necessary for private doctors' patients to be seen again so that records for payment, &c., might be completed. Some improvement might have resulted from giving known contacts a document that would have given them priority in the queues.

All contacts were vaccinated in three places, and members of the general public in only one. Meanwhile the sanitary inspector's staff had been reinforced, and all contacts were visited daily for seventeen days. Any found to be ailing, however slightly, were transferred to a special contact list and visited daily by a medical officer, and returned to the original list when a negative diagnosis had been made.

As indefinite rashes from vaccination, smallpox, o for some other reason might arise, a ward of 12 be was held in readiness at the local isolation hospital f the reception of any such cases. Three cases we admitted, and the provision of this ward proved to be definite safeguard.

A single large room, free of unnecessary furniture, w found to be the ideal vaccination centre, with, if possib additional shelter for applicants. The queue should be divided into smaller queues according to the numb of vaccination teams. Each vaccinating team shoul consist of a clerical assistant (to whom the patient go first) to enter particulars on the form, a nurse to prepar arms, the medical officer, and a volunteer to cover th vaccination mark with strapping after drying.

CONCLUSIONS

The following conclusions may be drawn from t experience:

(1) It is desirable that persons in attendance o smallpox patients on board ship should be specifical notified to the medical officers of health of the di to which they proceed when they land in this count

(2) Vaccination in infancy may protect for very man years, but does not necessarily do so.

(3) It appears likely that one vaccination mark do not protect as completely as two or more. It seem desirable that a primary vaccination should consist three marks, and a revaccination of at least two.

(4) During an outbreak, when there is a rush vaccination centres, contacts should be given priori by a system of tickets.

(5) For doubtful rashes an observation ward in t nearest isolation hospital is of great value.

(6) Abortive smallpox would be a good name for t illness now known as variola sine variolis, variola si eruptione, or contact disease.

Our thanks are due to Dr. T. Stevenson Logan, M.O.H. Southend, for the information concerning the Southend ca

REFERENCES

Conybeare, E. T. (1939) *Lancet*, i, 813.
Harries, E. H. R., Mitman, M. (1940) Clinical Practice in Infecti Diseases, Edinburgh, p. 262.
Rolleston, J. D. (1925) Acute Infectious Diseases, London, p. 33

Detection of Typhoid Carriers

THE monthly bulletin of the Ministry of Health a the Emergency Public Health Laboratory Service f November contained a note on the detection of typh carriers, and practitioners may like to be reminded the suggestions made:

> "A chronic carrier may cease to excrete typhoid bac for no apparent reason, and may resume doing so witho any detectable alteration in his well-being. Epidemiologi evidence, although not conclusive, suggests that the interv of freedom may last for months or even years, but the agglutination test remains positive during these interv It is not proposed that any control, other than that affor by the Public Health (Infectious Diseases) Regulations, 1 should be exercised over carriers, and in this connexion t attention of medical officers of health is called to pages to 60 of the Annual Report for 1932 of the Chief Medi Officer of the Ministry where the subject is dealt with.
>
> "The method of detection is, before discharge from h pitals every typhoid convalescent should have a blood t for Vi-agglutinins. If they are absent, no further action ne be taken. If present (as might be expected in about one-h the cases) a second test should be made three months la when, if they are no longer present, nothing further need done. If, however, Vi-agglutinins are present in a titre high as, or higher than, before, two examinations a we for three weeks, of the stools and urine or, failing this, examinations with as long an interval as possible between should be made by selective cultural methods to find whether typhoid bacilli are being excreted. If they are, t patient should be regarded as a persistent carrier; if th are not, it might be advisable to repeat the Vi-agglutinati

three months later to see whether the titre is falling. her action would depend on circumstances.

As every case of typhoid fever owes its origin to a carrier dder), it is an obvious advantage to a medical officer of th to know at least some of the potential sources of tion in his district. By ascertaining the type of infecting nism by the Vi-bacteriophage method, and by keeping a ster of the names and addresses of the carriers thus typed, nay prove easier to trace the source of infection of fresh s when they arise.

The Emergency Public Health Laboratories have been uested to do all they can to assist medical officers of health naking the proposals effective."

t is estimated that in 5% of cases of typhoid fever aised titre of Vi-agglutinins persists for six months or re and that 2% or more of patients become chronic riers. Of the latter, 90% have a permanently elevated agglutinin titre. The measurement of Vi-antibody is erefore a valuable indication of the carrier state.

Typhoid and Paratyphoid

Up to August 19 123 cases of typhoid had been mitted to hospitals in Wales and 2 had died. Further ses in visitors believed to have been infected by means ice-cream consumed at Aberystwyth have been admitted hospitals in various parts of England but the total mber is uncertain. This outbreak appears to be on e decline, as might be expected following the discovery the vehicle of infection.

A number of persons, mainly children, living in Halifax nd surrounding districts are suffering from an illness elieved to be paratyphoid B and have been admitted hospital. The nature of the illness and its origin are eing investigated.

Infectious Disease in England and Wales

WEEK ENDED AUGUST 10

Notifications.—Smallpox, 0; scarlet fever, 707; whooping-cough, 1910; diphtheria, 243; paratyphoid, 13; typhoid, 89 (48 in Cardiganshire); measles (excluding rubella), 3299; pneumonia (primary or influenzal), 298; cerebrospinal fever, 34; poliomyelitis, 18; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 84; puerperal pyrexia, 149; ophthalmia neonatorum, 58. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on August 7 was 900. During the previous week the following cases were admitted: scarlet fever, 36; diphtheria, 28; measles, 61; whooping-cough, 31.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 2 (0) from measles, 7 (0) from whooping-cough, 2 (0) from diphtheria, 34 (5) from diarrhœa and enteritis under two years, and 3 (0) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 61 (corresponding to a rate of 32 per thousand total births), including 28 in London.

A LIBRARY BAEDEKER.—The National Research Council of America has brought out under the editorship of Mr. R. R. Hawkins, chief of the science and technology division of the New York Public Library, a *list of Scientific, Medical, and Technical Books*, published in the United States from 1930 to 1944 which are still in print and available for domestic and foreign distribution. The task of deciding which books were to be included was undertaken by a committee of the council under the chairmanship of Mr. Harrison Craver and, after his retirement through illness, of Dr. John Fulton. The committee believed that a carefully selected group of books would be more useful than a longer but less informative list, and the complete title, publisher, price, and list of contents of each of the 6000 books included is given, accompanied by a short descriptive commentary on the book's purpose and scope. As a guide to the jungle of present-day technical publications the list will be of value both to the expert and to the casual inquirer, and is one more proof that Americans realise it is important that books should be read as well as written. Inquiries about the bibliography should be addressed to the United States International Book Association, 27, East 67th Street, New York City, 21.

Letters to the Editor

PROSPECTS IN POLIOMYELITIS

SIR,—We have read with dismay your leader of July 27 in which it is implied that the efforts to control poliomyelitis in Ireland are "applied on a large scale without more justification than that of the placebo." May we draw attention to points in your leader which are open to criticism and correction?

(1) The scheme of control did not (as stated in your leader) include chlorination of water-supplies, but recommended the boiling of milk and water in all areas where a piped supply was not available. In only one case was chlorination of a water-supply advocated—namely, in the case of a large boarding-school whose supply came from a private reservoir. For this school also the immersion before washing of all feeding utensils in *heavily chlorinated water* was advised. This is a procedure very different from the chlorination of water-supplies to rid them of bacterial pollution. It was a more sensible and practicable measure to advise than the boiling of all crockery, knives, and forks, which for many reasons would not have been possible.

(2) You state that the committee of experts who advised on poliomyelitis in boarding-schools was guarded in its advice on quarantine. This is not correct. In (*a*) the note to headmasters, (*b*) a suggested "form of letter" to parents, and (*c*) the revised section on poliomyelitis in the *Code of Rules for the Prevention of Communicable Diseases in Schools* (*Lancet*, 1946, i, 972) quarantine for three weeks is definitely recommended.

(3) You suggest that the difficulties rendered quarantine impracticable, and that there is "no solution to the problem of compensation for loss of earnings which at once arises when a quarantine of adult contacts is attempted in the ordinary household." In this country, under the Public Health (Infectious Diseases) Regulations 1941, local authorities compensate for any damage sustained by persons who are affected by public-health measures taken to control the spread of infection; for instance, compensation has been paid to farmers prohibited from sending milk to creameries. The economy of rural Ireland, where towns are small and scattered and the vast majority of the population lives on separate small holdings, permits of a high degree of quarantine. It was precisely to show the practicability of this procedure in Ireland that we wrote the paper which you published on July 6.

(4) You question the value of school closure. Since F. M. Burnet was mentioned in your leader, may we refer to the fact that in the Melbourne epidemic of 1937–38 he found (Dunham lectures, Harvard, 1944) that some fairly direct chain of contact between children could nearly always be traced. Geographical spread of the disease from suburb to suburb was very evident, and in nearly every instance the first child to be infected in a new suburb could be shown to have visited, or been visited by, a child from a suburb already affected. There was no evidence of carriage of infection by adults. Poliomyelitis in the Melbourne epidemic, he believed, was spread from child to child as a result of their own contacts—the source of the virus being sometimes salivary, from pharyngeal infection, and sometimes fæcal.

In rural Ireland the school is the principal point of child aggregation. Neglect of such an important means of transmission cannot be entertained.

(5) You say that "the relation between flies infected by excreta or sewage and the spread of the disease among human beings has not yet been established." This statement must be accepted with reserve, since it has not yet been proved that there is no relation, and particularly since (in point of time, &c.) we know little of the cycles or phases of virulence or extrahuman existence of the virus. Further the importance of the intestinal route of infection is increasingly recognised. The part played by flies in carrying the virus has been ably demonstrated by Sabin and Ward and other American workers. More recent work by Ward, Melnick, and Horstmann has shown that food infected with virus is capable of transmitting the virus to flies which were fed on it (*Science*, 1945, 101, 491). To anyone with a knowledge of flies the further contamination of foodstuffs by them is no mystery.

intense headache and backache, and all other prodromal symptoms may be present, including erythematous or petechial eruptions . . . its true nature is shown by its occurrence in an epidemic focus and by the sudden termination of the disease on the third day before the appearance of the papular eruption. Such cases are apt to be encountered among recently vaccinated persons shortly after joining the staff of a smallpox hospital, and several examples have lately been reported among recently vaccinated soldiers (Vorpahl, Klaholt, Kathe)."

Harries and Mitman (1940) describe variola sine eruptione as " smallpox confined to the initial toxæmia occurs in the previously vaccinated. . . . Occasionally a few small and atypical focal lesions may appear and be possibly overlooked."

In view of the so-called abortive case in this outbreak and the extracts quoted above, it seems reasonable to conclude that such cases may show some or all of the prodromal signs and symptoms of smallpox, and that these then fade out without any appearance of the true rash. We suggest that abortive smallpox would be a better and simpler name for the conditions previously described as variola sine eruptione, variola sine variolis, and contact disease.

VACCINATION OF CONTACTS

The present outbreak led to a considerable demand for vaccination. The contacts of H. R. were numerous, and many of them unknown; and A. R., during the first three days of his illness, had attended church services, a Sunday school, a wedding, and a technical school. Vaccination was offered to all known contacts, and a special vaccination session for children was held in the technical school. The public vaccinators were hard pressed, because, besides ordinary contacts, all laundries, libraries, and salvage-collecting personnel were warned. By Feb. 23 the list of known contacts exceeded 1000, and assistance was given by the county medical and nursing staffs.

On March 3 it was decided to open special vaccination centres. Up to this time all contacts had been vaccinated at the public vaccinators' surgeries (except the special clinic held for school-children). By March 9 five centres had been opened. These were greatly appreciated, as the weather had been particularly bad and there had been long queues standing in rain and snow outside the doctors' surgeries. In the five days March 4–9, 15,000 vaccinations were performed in the district. The assistance given by the Government Lymph Establishment at Colindale Avenue, London, N.W.9, was greatly appreciated.

On the whole, everything worked well, yet experience showed where improvements might have been possible. After the first few days it was realised that it would not be possible to reinspect all vaccinated contacts; so the public were informed that the only people who would be seen again a week after their vaccinations were (1) those who had been vaccinated for the first time and whose vaccination had not taken; (2) all infants under the age of one year (for vaccination certificates); and (3) all persons vaccinated by private doctors. The vaccinators by this time consisted of public vaccinators, other practitioners, medical officers on the staffs of health departments, and medical students working under supervision. It was necessary for private doctors' patients to be seen again so that records for payment, &c., might be completed. Some improvement might have resulted from giving known contacts a document that would have given them priority in the queues.

All contacts were vaccinated in three places, and members of the general public in only one. Meanwhile the sanitary inspector's staff had been reinforced, and all contacts were visited daily for seventeen days. Any found to be ailing, however slightly, were transferred to a special contact list and visited daily by a medical officer, and returned to the original list when a negative diagnosis had been made.

As indefinite rashes from vaccination, smallpox, or for some other reason might arise, a ward of 12 beds was held in readiness at the local isolation hospital for the reception of any such cases. Three cases were admitted, and the provision of this ward proved to be a definite safeguard.

A single large room, free of unnecessary furniture, was found to be the ideal vaccination centre, with, if possible, additional shelter for applicants. The queue should be divided into smaller queues according to the number of vaccination teams. Each vaccinating team should consist of a clerical assistant (to whom the patient goes first) to enter particulars on the form, a nurse to prepare arms, the medical officer, and a volunteer to cover the vaccination mark with strapping after drying.

CONCLUSIONS

The following conclusions may be drawn from this experience:

(1) It is desirable that persons in attendance on smallpox patients on board ship should be specifically notified to the medical officers of health of the district to which they proceed when they land in this country.

(2) Vaccination in infancy may protect for very many years, but does not necessarily do so.

(3) It appears likely that one vaccination mark does not protect as completely as two or more. It seems desirable that a primary vaccination should consist of three marks, and a revaccination of at least two.

(4) During an outbreak, when there is a rush to vaccination centres, contacts should be given priority by a system of tickets.

(5) For doubtful rashes an observation ward in the nearest isolation hospital is of great value.

(6) Abortive smallpox would be a good name for the illness now known as variola sine variolis, variola sine eruptione, or contact disease.

Our thanks are due to Dr. T. Stevenson Logan, M.O.H. for Southend, for the information concerning the Southend cases.

REFERENCES

Conybeare, E. T. (1939) *Lancet*, i, 813.
Harries, E. H. R., Mitman, M. (1940) Clinical Practice in Infectious Diseases, Edinburgh, p. 262.
Rolleston, J. D. (1925) Acute Infectious Diseases, London, p. 336.

Detection of Typhoid Carriers

THE monthly bulletin of the Ministry of Health and the Emergency Public Health Laboratory Service last November contained a note on the detection of typhoid carriers, and practitioners may like to be reminded of the suggestions made:

" A chronic carrier may cease to excrete typhoid bacilli for no apparent reason, and may resume doing so without any detectable alteration in his well-being. Epidemiological evidence, although not conclusive, suggests that the intervals of freedom may last for months or even years, but the Vi-agglutination test remains positive during these intervals. It is not proposed that any control, other than that afforded by the Public Health (Infectious Diseases) Regulations, [illegible] should be exercised over carriers, and in this connexion the attention of medical officers of health is called to pages [illegible] to 60 of the Annual Report for 1932 of the Chief Medical Officer of the Ministry where the subject is dealt with.

" *The method of detection is, before discharge from hospitals* every typhoid convalescent should have a blood test for Vi-agglutinins. If they are absent, no further action need be taken. If present (as might be expected in about one-half of the cases) a second test should be made three months later when, if they are no longer present, nothing further need be done. If, however, Vi-agglutinins are present in a titre as high as, or higher than, before, two examinations a week for three weeks, of the stools and urine or, *failing this*, [illegible] examinations with as long an interval as possible between should be made by selective cultural methods to find out whether typhoid bacilli are being excreted. If they are, the patient should be regarded as a persistent carrier; if they are not, it might be advisable to repeat the Vi-agglutination st when she had ceased having general light. The ond case developed lupus carcinoma.

Of the patients whose E.S.R. decreased, all were nically improved: and in those cases where the rate ried within normal limits or remained virtually altered, the clinical changes varied from none to parent cure.

My impression. therefore. is that the E.S.R. is of little lue in judging the progress of lupus vulgaris treated ith calciferol. The effect of calciferol on the plasma rinogen is being investigated.

Skin Department, London Hospital, E.1. P. J. FEENY.

VARIATION IN THE FEMALE PELVIS

SIR,—Whilst congratulating Dr. Nicholson and Mr. andeman Allen on their paper of August 10, I feel that ey have over-simplified both the ætiology and the variaons themselves.

No study of the pelvis, especially when its object is to retell the course of labour, can be complete unless the avity, and more particularly the sacrum, are considered. here can be little doubt that the shape of the sacrum nd its angular relation to the rest of the pelvis have a ost profound effect on the mechanism of labour; n fact, of the plates taken at an X-ray pelvimetric xamination. that giving the lateral view is of greater nportance than the others. Nowhere in their paper o Nicholson and Allen mention the sacrum or the ateral view of the pelvis.

It is true to say that what will happen to the fœtal kull at the brim of the pelvis is largely governed by the ondition in the cavity; the measurements at the brim nay be adequate whilst those in the cavity are too small o receive the skull. The size and shape of these cavityneasurements depend more on the shape and position of he sacrum than on all the other factors combined.

In my opinion it is seldom possible to place any elvis in one of the four simple groups given in this aper. The value of Caldwell and Molloy's classification ies to a great extent in its description of the parts of the pelvis other than the brim and outlet; the shape of the sacrum and the form and size of the sciatic notches are, for instance, included; and the mixed types of pelves, which form the majority, are easily and clearly described by terms such as gynæ-android.

So far as the sacrum is concerned, it has been my experience not only that there are very many different shapes and positions but that these characteristics do not follow any particular rule in relation to the type of pelvis. With the exception of a few types, such as the retroposed sacrum often found in the rickety flat pelvis, it would be very difficult to prove a nutritional cause for the many variations found in this bone.

Clinically, any pelvic examination which is concerned with the inlet and outlet only is largely a waste of time; at the brim the progress of the fœtal head can be followed during labour, and the possibilities at the outlet should have been determined clinically beforehand. It is important, however, to know what course the head will take in the pelvic cavity and what difficulties it will meet with there: this information cannot be deduced by any simple measurement of the brim or outlet, however accurate, and a prognosis based on either an opinion or on a mathematical calculation from knowledge of these two planes only can be of little value. A lateral view of the pelvis is absolutely necessary, and this must be assessed by somebody knowing the effect on the mechanism of labour of the shape and position of the sacrum.

Hope Hospital, Pendleton, Salford. GUY ROWORTH.

FIGURES, FACTS, AND FANCIES

SIR,—In your issue of August 10, Professor Heuer's painstaking and valuable monograph on the treatment of peptic ulcer is reviewed. The general tone of your review is one of pious resignation and gentle tolerance of yet "one more attempt to draw conclusions from a statistical analysis of 1139 cases." The phrases "in spite of the burden of figures" and "it is a pity that Dr. Heuer has restricted himself so rigidly to his figures" which appear in the review are typical of the frame of mind to which I refer.

I would suggest, Sir, that the tone of this review does poor service not only to the eminent journal in which it appears but to British medicine as a whole.

The day of the authoritative statement based on the occult science of clinical instinct is dying. Medical students and practitioners of the present require something more than an air of omniscience and a Harley Street address to convince them of the value of a particular line of treatment.

Those who affect to despise the critical evaluation of results by careful follow-up and assessment (a method of which Professor Heuer's monograph is a model) are careful never to be too explicit about the basis for their own views. I heard an Eminent Surgeon at an Eminent Society recently suggest that a more valuable way of forming an opinion was to investigate the incidence of private referred cases! (Dare I point out that this itself is statistics in miniature!)

May I venture to suggest, Sir, that one of the main reasons that figures are so unpopular in British medicine is that the assessment of results is time-consuming, exasperating. and unremunerative, whilst operating is rapid. pleasant, and profitable? Many a man has made a fortune with his scalpel, but the follow-up card too often brings nothing but disappointment and contumely.

It would be a good thing for British medicine if each hospital and nursing-home were compelled to publish an annual report, compiled by an impartial body, of the end-results of the treatment undertaken within its walls.

Edinburgh. D. M. DOUGLAS.

EMERGENCY BED SERVICE

SIR,—The many London doctors who made use of the Emergency Bed Service during the war must often have wondered just how long it would continue to work only by day. It was, of course, always intended that a 24-hour service should be provided, and prior to the war this was done. War-time difficulties, however, made this impossible to maintain, and for many years the service has closed at 10 P.M. Indeed, at one time it had to close at "blackout," as the windows and curtains had been blown away!

Now that it is possible to obtain the necessary staff and to run the office free from enemy interference, the committee have decided to resume the full 24-hour service, and from 9 A.M. on Sept. 1 it will be available to doctors day and night throughout the year.

The service continues to deal with all acute and urgent cases, excluding fevers, but, owing to the prevailing shortage of beds in London, it often takes considerably longer to find a bed than it did before the war, and it is quite impossible to deal with a case not in absolute need of immediate admission. Subject to these limitations, every possible assistance will be given to doctors.

Voluntary Hospitals Emergency Bed Service, R. E. PEERS
10, Old Jewry, London, E.C.2. Secretary.
(Monarch 8515.)

"MASKED" SYPHILIS

SIR,—I was much interested in the paper by Dr. E. Cronin (July 20, p. 84). It recalls a point which often eludes clinicians—namely, the masking effect of the "provocative" injection of neoarsphenamine (N.A.B.)

Many years ago a patient was sent to me with a penile ulcer, which appeared three weeks after a visit to India. Before the visit his doctor sent me a specimen of blood, which I found negative to the Wassermann and Kahn reactions. The penile ulcer was about 1 in. in diameter, with shelving edges: there was slight enlargement of the inguinal glands on both sides, but no tenderness. There was no rash or sore throat. I kept the patient two days and performed about six dark-ground examinations of material from the ulcer and from puncture of tissues near the ulcer; all were negative. I repeated the blood-tests; they too were again negative. I sent him back to his doctor with the advice that he should have no antisyphilitic treatment and that the blood-tests should be repeated every week for six weeks. The doctor adopted my suggestion about the repeated blood-tests, but, on the advice of a surgeon, he gave the patient a "provocative" injection of N.A.B. 0·3 g. the day after the repeated dark-field examinations. Needless to say, I was not told of this injection. The six weekly tests were all negative. Three months after I first saw him the patient went home to England on leave and there developed a sore throat and

The control measures operated here are a logical outcome of the discovery of the intestinal route of infection. We know already that we are at present helpless in the face of abortive and unrecognised cases to control or prevent the spread of poliomyelitis infection to our satisfaction. We cannot agree, however, that we are so beaten that we cannot even attempt experimental efforts of control.

Your leader advances the view that at present the chances of preventing poliomyelitis are remote and that this tragic disease must be accepted as " a risk inseparable from social life in human communities," without however giving any evidence or results from well-organised efforts to control it. It says also that " it seems reasonable to forecast that the disease will in the end be robbed of its virulence if not of its powers of spread "—again without any concrete basis or authority for such an assertion.

Burnet in his Dunham lectures has stated the position so clearly that it is well to quote his exact words: " epidemiologically, the paralytic disease whose incidence is described in vital statistics is merely a means of recognising the existence of virus in the community and of estimating to some extent its range of distribution and its relative virulence." Again: " it is probable that the major factor responsible for the epidemic appearance of paralysis is the occurrence of biologically irrelevant mutation in the virus to an unduly invasive type."

It has been clearly shown that the virus has been *isolated most frequently from the fæces of persons who* were close family contacts with a known paralytic case; less frequently from those with more remote contact; and very seldom among those who had no contact with a case. Far from any attempt to provide a placebo, it seems to us sound common sense and our duty to attempt to protect the rest of the community when a focus of a virulent strain is indicated by the appearance of a paralytic case.

At the risk of over-simplification, we may regard it as reasonably certain that this disease exists in the community, either in human or other carriers, in a harmless state; that it can take on a virulent phase either through a biological mutation or some unknown influence; that the occurrence of a paralytic case indicates a focus of this virulent type; and that the existence of healthy carriers of this virulent strain seems likely to be limited to those in contact with paralytic cases. We believe that efforts to organise control measures on these bases should be made, and that epidemiological control, in the present state of knowledge, can only be achieved by experimental trial of such methods as we have advocated.

While it may be accepted that at present the chances of preventing poliomyelitis are remote, there is no justification for the defeatist attitude that we should do nothing to find ways or means to control its spread. Indeed, there is not yet sufficient knowledge on poliomyelitis to justify neglect of any approach, and there is sufficient basis and justification—in spite of this scanty knowledge—to endeavour, by trial-and-error experimentation, to control the spread of the disease.

JAMES DEENY.
JOHN D. MACCORMACK.

Department of Local Government and Public Health, Dublin.

THE WEST INDIES

SIR,—Your annotation of July 27 on nutrition in the West Indies again draws attention to the poor conditions which have long existed and for which the passage of time makes it increasingly difficult to provide a real remedy. Dr. Platt in his report rightly suggests action which could be taken now to mitigate in part the effect of faulty dietetics. Despite what in the way of palliatives may be done towards raising nutritional standards in the islands under British rule, these standards are bound up with the general economic circumstances obtaining in all except Trinidad, which island still has unexhausted natural resources, and in any case has, among other advantages, a key position on trade routes. These basic advantages should in time produce their own rewards, though anyone who knows Trinidad is aware of the prejudice and usages which, somehow, must first go.

Your annotation refers to some of the factors recognised as retarding better conditions in these lovely islands which are in grave danger of becoming tropical slums. Whether we like it or not, much of the prevailing distress results from the actions of our forefathers, who, among other questionable activities, started overpopulating the islands by the uncontrolled introduction of coloured labour. It is common knowledge that, with other measures, most praiseworthy endeavours are now being made to develop crops which do not have to compete in world markets, increasingly supplied from better geographical and (in the case of sugar) subsidised sources; yet the fundamental cause of much of the trouble persists. *That is, there is an increasing population* living on overworked soil. For this reason many of us feel that the only ultimate salvation for the West Indies is to encourage emigration to the British territories on the nearby mainland which have a sufficiency of fertile soil to enable those who are transferred to become self-supporting, and, for the more ambitious, sufficient space to develop agriculture on a large enough scale to enter world consumer markets with some prospect of competing successfully. Were a university ever to be founded in the British West Indies, its dominant theme should be agricultural, rather than legal or artistic; the nucleus for this already exists.

It is a professional responsibility to see that technical advances, whether in therapeutics or dietetics, are applied as rapidly as possible, respectively at the bedside and in the realms of public health. These advances can only be employed to the best advantage when the fundamental *background receives proper attention.*

London, W.8. W. R. THROWER.

FOLIC ACID

SIR,—May we correct a statement in your annotation of June 29? Neither propionic aldehyde nor *p*-aminobenzoyl chloride were starting materials in the synthesis of pteroylglutamic acid. The immediate starting materials were *p*-aminobenzoylglutamic acid, α, β-dibromopropionaldehyde and 2, 4, 5-triamino-6-hydroxy pyrimidine. The α, β-dibromopropionaldehyde was made by brominating acrolein. The *p*-aminobenzoylglutamic acid *was made by reacting p-nitrobenzoyl chloride* and glutamic acid *to form p*-nitrobenzoylglutamic acid. this compound was then reduced to the corresponding amine.

Also, folic acid under the trade name of 'Folvite' has been available on the market since several months before our article in *Science.*

ROBERT B. ANGIER

New York, U.S.A. Lederle Laboratories Inc.

*** Folvite has not yet reached this country except in small quantities distributed for experimental purposes. We understand from Messrs. Chas. Thackray, English agents for Messrs. Lederle, that they are expecting a supply.—ED. L.

CALCIFEROL AND SEDIMENTATION-RATE

SIR,—In view of the significance attached to serial estimations of the erythrocyte-sedimentation rate (E.S.R.) in chronic infections, I should like to draw attention to the following observations extracted from an investigation I am making.

The data, which will later be more fully reported, are obtained from the first 32 of a series of patients with lupus vulgaris who have been given calciferol daily, usually in doses of 100,000 units.

After 4–7 months: (1) 50 % of the patients showed an increase in E.S.R., averaging +170 %; (2) 15 % showed a reduced rate, averaging −160 %; and (3) the remaining 35 % showed variations within normal limits or virtually *no change.*

Half the patients whose E.S.R. increased were clinically apparently cured or considerably improved. In each of these, however, the E.S.R. was normal at the commencement or after a few weeks of calciferol therapy; and in each the E.S.R. was increased beyond normal limits after 3–4 months.

Of the other half whose E.S.R. increased, 6 showed little or no clinical change, and the remaining 2 deteriorated. Of these 2, one, a female with long-standing lupus, apparently healed after a course of Finsen and general light, relapsed after $4^{1}/_{2}$ months on a maintenance dose of calciferol (50,000 units daily); her general light had been discontinued for this $4^{1}/_{2}$ months, and the relapse was in accordance with her usual history in the

ELEANOR CECILY THISTLETHWAITE

M.B. ST. AND.

Dr. Thistlethwaite, who died on June 6, was born the Philippines in 1896, and graduated M.B. at Andrews University in 1920. After holding resident sts at the Queen's Hospital for Children, Hackney, e spent five years in general practice in Gray's Inn oad and Camden Town. She held posts at the London ock Hospital and the Islington medical mission l in 1935 she became visiting medical officer to . Margaret's Hospital, Kentish Town, where she was sponsible for the care of children suffering from vulvo-aginitis and ophthalmia neonatorum. During the war, medical officer to a mobile naval train, she gave aluable service at the evacuation of the wounded after unkirk. Later, during the first London blitz, as ssistant medical officer of health for St. Pancras with pecial responsibilities for air-raid precautions, she ften remained at the first-aid stations night and day. er chief, the late Dr. Maitland Radford, formed a very igh opinion of her conduct and services through this esting time.

At the beginning of 1943 Dr. Thistlethwaite was ppointed assistant medical officer for Southend-on-Sea. n the school medical service and at the V.D. treatment entre she gained the confidence of patients, parents, nd children, and her kindly interest and wide experience f life quickly enabled her to make a unique position for erself.

VERNON THORNE THORNE

M.B. CAMB., D.T.M. & H.

Vernon Thorne Thorne was born in 1904, the son of r. Richard Thorne Thorne and grandson of Sir Richard horne Thorne, F.R.S. Educated at Marlborough and aius College, Cambridge, he followed his father and randfather to Bart's in 1926. After qualifying in 1930 e spent three years in general practice with his father Woking before joining the Colonial Medical Service. Vhen war broke out in 1939, he failed to obtain his elease to join the R.A.M.C. and continued with his uties in Nigeria and the British Cameroons, working xceedingly hard for long extended tours. Last year became seriously ill and was invalided home suffering rom a tropical form of chronic endocarditis. After hree months in hospital he returned to Woking, where e died on August 5.

He was married at St. Bartholomew's the Great in 938, and leaves a wife and daughter.

Births, Marriages, and Deaths

BIRTHS

LOOM.—On August 6, in London, the wife of Dr. Harold Bloom—a daughter.

AWKINS.—On August 10, at Oxford, the wife of Dr. G. F. C. Hawkins—a daughter.

EESON.—On August 1, at Leicester, Dr. D. Jean Leeson (*née* Mackay), the wife of Dr. Clifford A. Leeson—a son.

EWMAN.—On August 11, the wife of Mr. Philip Newman, F.R.C.S.—a son.

AUL.—On August 10, at Liverpool, the wife of Major Richard Paul, R.A.M.C.—a son.

ANDERSON.—On August 7, the wife of Dr. A. W. Sanderson, of Stocksfield, Northumberland—a son.

MARRIAGES

ALDERWOOD—SWAIN.—On August 14, at Blackpool, Robert Calderwood, M.B., Malayan Medical Service, to Marjorie Swain, M.B., of West Timperley, Cheshire.

OWARTH—HOPKINS.—On July 16, at Llanilid, Frank Hugo Howarth, M.B., major R.A.M.C., to Lucy Gwendoline Irene Hopkins.

ADDOX—SIMMONS.—On August 14, at Alderley Edge, Frederick Christopher Maddox, M.B., to Catherine Simmons, M.B.

DEATHS

URKE.—On July 22, at Manila, Philippine Islands, William Joseph Butler Burke, B.A., M.D. Dubl., aged 72.

AVIDSON.—On August 15, in Edinburgh, Arthur Davidson, M.B. Aberd., surgeon captain R.N., retired.

ORBES.—On August 13, at Weymouth, Colin Macphail Forbes, M.B. Glasg.

ARSHALL.—On August 10, in London, Robert James Marshall, M.D. Glasg., formerly of Shanghai.

AY.—On August 15, Otto May, M.D. Camb., F.R.C.P., aged 67.

ISSE.—On August 14, in London, Bertram Sydney Nissé, M.D. Lond., M.R.C.P.

AVERY.—In August, at Dun Laoghaire, co. Dublin, Frank Savery, M.R.C.S., formerly of Ealing.

AYLOR.—On August 15, at Tunbridge Wells, Frederick Howard Taylor, M.D. Lond., M.R.C.P., F.R.C.S., aged 83.

Notes and News

UNITED STATES' DIETARY

FOR some years the American housewife has been becoming increasingly nutrition-conscious, partly through newspapers and the radio, but mainly perhaps through the warm lunches provided for school-children and factory workers. The change is reflected in the altered food habits since 1909, when accurate records were first kept. The consumption of grain products has declined by a third, and there has been some reduction in the demand for meat; against this, greater variety and increased consumption of vitamins have been attained by wider distribution of milk, fruits, and vegetables. According to a review published by the Bureau of Human Nutrition and Home Economics, the total calories and protein consumed during the war period were less than at any time since 1909; but this was offset by a further increase in the distribution of almost all the protective foods.

University of London

The title of professor of clinical pathology in the university has been conferred on Dr. R. J. V. Pulvertaft, in respect of the post held by him at Westminster Hospital medical school.

The title of professor of embryology in the university has been conferred on Mr. G. R. de Beer, D.SC., F.R.S., in respect of his post at University College, as from Oct. 1, 1945.

Mr. Ian Aird has been appointed to the university chair of surgery tenable at the British Postgraduate Medical School, as from Oct. 1.

Mr. Aird qualified M.B. at Edinburgh in 1928, and was awarded the Annandale gold medal and the Wightman prize in clinical medicine. After resident appointments, including periods as house-surgeon at the Royal Infirmary and the Royal Hospital for Sick Children, Edinburgh, he attended postgraduate courses in Paris and Vienna. In 1930 he became F.R.C.S.E. From 1931 to 1935 he was senior clinical assistant and clinical tutor in the wards of Mr. J. M. Graham at the Royal Infirmary, Edinburgh. In 1934, with a Rockefeller travelling fellowship, he went for a year to the United States, where he trained under Prof. Evarts A. Graham, at St. Louis, Missouri; and he held appointments as research fellow in surgery in the University of Washington, and extra assistant in the department of surgery at Barnes Hospital. On returning to this country in 1935 he graduated CH.M., and was appointed to the staff of the Royal Edinburgh Hospital for Sick Children; in 1939 he was promoted to full charge. In the same year he became temporary assistant surgeon, and in 1943 assistant surgeon, to the professorial surgical unit in the Edinburgh municipal hospitals. From 1939 to 1943 he served with the R.A.M.C., holding the rank of lieut-colonel. Since then he has been surgeon to the E.M.S. Hospital at Gogarburn. He is lecturer on diseases in children, and assistant director of the Wilkie surgical research laboratories, at Edinburgh University.

Dr. B. S. Platt has been appointed to the chair of human nutrition tenable at the London School of Hygiene and Tropical Medicine, as from a date on which he can take up his appointment.

Dr. Platt graduated B.SC., with first-class honours in chemistry, at Leeds in 1923, and M.SC. the following year. In 1926 he became PH.D., and in 1930 qualified M.B. After a period as house-physician at Leeds General Infirmary he was appointed associate in medicine in the division of clinical research of the Henry Lester Institute of Medical Research, Shanghai. In 1938 he joined the scientific staff of the Medical Research Council, and since 1944 has been director of the human nutrition research unit. A report of his nutritional survey of the West Indies was published earlier this year.

As announced last week, Dr. Ronald Hare has been appointed to the chair of bacteriology tenable at St. Thomas's Hospital medical school, from Oct. 1.

Dr. Hare won the senior entrance scholarship at St. Mary's Hospital in 1919, and qualified M.B. Lond. in 1924. In 1926 he was awarded the Cheadle gold medal and gained a research scholarship at the institute of pathology and research, St. Mary's Hospital. He won the Katherine Bishop Harman prize in 1928, and the Nicholls prize in 1934. In 1935 he graduated M.D. After five years on the staff of the inoculation department at St. Mary's Hospital, he took part in the planning and organisation of the research laboratories at Queen Charlotte's Hospital, and was first assistant there until 1936. During this period he carried out extensive researches on the streptococci and the part they play in puerperal infection. In 1936 he went to Canada, where he has since remained, holding appointments as research associate in the Connaught laboratories and as lecturer in the department of hygiene and preventive medicine in the University of Toronto. In addition to undertaking research on the virus of influenza and the large-scale manufacture of influenza vaccine, he was for a time in charge of the planning and organisation of the penicillin plant set up at the University of Toronto by the Canadian Government in 1943. His published work includes contributions on the classification of the hæmolytic streptococci, the mechanism of wound infection, the spread of nasopharyngeal infection, and the epidemiology of influenza.

Dr. J. M. Robson has been appointed to the readership in pharmacology, tenable at Guy's Hospital medical school, as from Oct. 1.

A VERSATILE CARCINOGEN.—In the second paragraph of our annotation of August 17 (p. 242) the word "Leeds" should be substituted for "Sheffield."

rash; he consulted a specialist who found his Wassermann and Kahn blood-tests strongly positive and diagnosed syphilis, much to the discomfiture of the patient. This case was later quoted against me, as an example of malpraxis.

In an article on the prophylactic treatment of accidental inoculations with *Treponema pallidum* (*Trans. Ass. Amer. Phys.* 1938, 53, 281) H. J. Morgan expresses his belief in immediate treatment with intravenous N.A.B. 0·6 g. followed by a course of three injections of N.A.B. 0·6 g. He cites L. Fournier and L. Guenot (*Pr. méd.* 1919, 27, 354), who treated 40 women just after intercourse with a male with a penile chancre. Of these women, 5 refused treatment, and the other 35 received either arsphenamine 1·0–1·2 g., or N.A.B. 1·2–2·0 g. The 5 untreated all developed syphilis; none of the treated women developed syphilis.

It would appear that the "provocative" dose of N.A.B. has no place in the treatment (or diagnosis) of syphilis; the so-called Jarisch-Herxheimer reaction, if it occurred, must have passed unnoticed by the patient and his attendants in my case; and I think the N.A.B. 0·3 g. certainly helped to obscure the diagnosis. For those who can learn, the educational value of such a series as Dr. Cronin's is inestimable.

Palmer's Hill, Epping. FRANK MARSH.

THE COMMON COLD

SIR,—A new attack is to be made on the common cold by a research unit established by the Medical Research Council at the Harvard Hospital, Salisbury. May I call attention to a method of treatment which I have found effective in many cases over many years?

As soon as the first signs of a cold are apparent the patient should gargle, two-hourly, with a solution of 20–25 drops of liquor ammoniæ dilutus *B.P.* in half a tumbler of water. By this simple and harmless remedy the symptoms are as a rule relieved or removed within a few hours. The many other solutions, including antiseptics, which I have tried in the same way have not had the same success, and the effect of ammonia on the swollen mucous membrane of the *nasopharynx* may perhaps be related to its effect on acute urticaria or on the weals caused by stings or the injection of histamine.

London, W.1. B. O. C. PRIBRAM.

C.CM. OR MILLILITRE?

SIR,—Dr. J. M. Hamill, in his letter of August 17, attributes to me a statement or thought which I have not expressed. I am not concerned with the impropriety of converting c.cm. to millilitres by using the proper conversion factor. It is clearly not improper to do so, it is merely tedious. The only point at issue between us is that in my opinion, as the volume of the c.cm. is not a millilitre (on this we are agreed), it is inaccurate for a clinician to say when he has injected so many c.cm. of a substance that he has injected the same number of millilitres.

London, W.1. G. E. BEAUMONT.

RESEARCH ON TUBERCULOSIS

SIR,—Dr. Newell's suggestion that an Institute for Tuberculosis Research should be founded in this country will find considerable support, for many are making gallant lone efforts to explore some part of the vast field of tuberculosis but there is at present no body which is coördinating these excellent efforts.

Research requires not only enthusiastic workers but also direction and adequate financial support. It would probably not be difficult to gather together a number of experts who would be capable of directing research, but to find the financial backing such a body needs is not going to be easy. But why start another tuberculosis organisation when there are already three which include amongst their members almost every enthusiastic tuberculosis physician in this country?

As long ago as May 30, 1942, a leader in THE LANCET entitled Three Over-Lords said that the action of the three organisations (the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council, and the Tuberculosis Association) had been "likened, trenchantly but not unkindly, to the fibrillating auricle—individual ineffective twitchings keeping a sluggish stream on the move"! Would not the formation of a new body add to these "ineffective twitchings"? This applies particularly to research, and the deduction "How much better would be the powerful systole of combined action" is specially significant in this particular field of tuberculosis work. The combined action of these three associations could do much to control and correlate Tuberculosis Research, but the provision of the necessary funds still remains a problem which I suggest should, in the first instance, be a matter for discussion with the Government; and the Three Over-Lords are the channels through which such discussion should be inaugurated.

Dr. Newell will do good service if he is able to collect the names of those interested in his plea for an Institute for Tuberculosis Research and if he would present their *demands to one, or all, of the associations* I have mentioned. If these bodies could take united action it is possible that his efforts will not have been in vain.

Berkhamsted. FREDERICK HEAF.

OUR HOUSES

SIR,—I was particularly interested in your leading article of July 27 on The Cult of the Obsolete. I would *like to add one specific item—namely, that every house,* no matter how small, should have two W.C.'s—one inside and one outside, for preference. Most of the even small houses built in the mid-Victorian era have a W.C. inside and one outside, but the majority of the houses built during the years 1914–39 (the "ribbon development" period) have only one.

An extra W.C. is a very great asset, and I submit that in many houses it would help to form regular habits during the early morning rush hours.

Plumstead, London, S.E.18. C. J. SAWARD.

Obituary

BERTRAM SYDNEY NISSÉ

M.D. LOND., M.R.C.P.

Dr. Bertram Nissé, physician to the Red Cross Clinic for Rheumatic Diseases, died in London on August 1 Educated at St. Olave's School, London, he entered the London Hospital with a Buxton arts scholarship and qualified in 1921. A year later he took his M.B., and in 1924 he was awarded the university gold medal for his M.D. thesis. He obtained the M.R.C.P. in 1925, and after holding house-appointments and a pathological assistantship at the London Hospital he became resident medical officer at the National Hospital for Diseases of the Heart, for cardiology and the chronic rheumatic diseases were already his main interests. Later he was promoted to chief assistant at the National Heart Hospital. Convinced of the practical importance of developing teaching and research in the rheumatic disorders and of improving standards of practice, he was one of the original *team of physicians who in 1930 founded the* B.R.C.S. clinic. During the war years, in the absence of Dr. W. S. C. Copeman on service, he was also in charge of the rheumatism clinic at the West London Hospital. A member of the International Society for Medical Hydrology, he was also a vice-president of the physical medicine section of the Royal Society of Medicine. In his monograph, published in 1938, he compressed into small compass the salient features of the chronic rheumatic diseases together with their physical treatment.

K. S. writes: "A fine physician, in both character and learning, Nissé gave to every patient the benefit of his wide knowledge of general medicine. For each he spared himself no effort to work out a comprehensive scheme of treatment, never falling into the common error of assigning an unduly dominant place to one branch of therapeutics. He was equally unstinting of his natural kindliness and sympathy, and was the same unruffled, dependable friend to all who sought his help even in his last year of ill health and anxiety. His untimely death comes at a moment when there is an awakening throughout the land to the need for a national campaign against rheumatism; his example and his work can ill be spared."

Dr. Nissé married in 1932 Miss Hélèna Jacobs, of Newcastle, and he leaves her with a son and a daughter.

MYTH AND MUMPSIMUS *

JOHN R. FORBES
M.D.Lond., M.R.C.P.
MEDICAL REGISTRAR, GUY'S HOSPITAL

ONE of the few advantages of world unrest is that it isturbs complacency and raises doubt. The last twenty ears, filled as they have been with the strife of men and he clash of opposing ideologies, have seen in all fields of uman activity greater changes in beliefs and greater uestionings of dogmas than perhaps any other period of istory. Such tendency to iconoclasm is clearly maniested in medicine. Where is the elaborate prescription f yesteryear, where the once universal ritual of purgation, vhere the quondam rigid line of distinction between "organic" and "functional" disease? For very many years they survived destruction, but doubt has been too much for them, and now they join phlebotomy and exorcism in limbo. A like tendency is clear in surgery. The position of Fowler, for so long unassailed, is today seriously endangered (Spalding 1946). The emptiness of many traditional doctrines is being exposed, and Truth peeps out from the well of superstition and ignorance.

ELIMINATION OF TOXINS

Yet the myth and the mumpsimus in medicine die hard, as reference to almost any recent textbook or a visit to the wards of a modern hospital will show. For example, the traditional forcing of fluids upon patients (with or without pyrexia) in the hope of thereby "aiding in the elimination of toxins" is still a popular custom. It is important to be clear in this matter. The replacement of fluid lost from the body by a sweating, pyrexial patient is, of course, essential. It is equally necessary to maintain a free flow of urine when a drug such as a sulphonamide, capable, in too great concentration, of damaging the kidneys, is being given. But the conception of the body as some sort of involved water-closet, to be cleansed by flushing with copious draughts of Imperial drink, is quite out of date.† We have given up belabouring the colon with purgatives and douches, and the sweat glands with diaphoretics and hot baths, in this quixotic battle against elusive toxins. It is time that the kidneys were rescued from similar assaults, and the patient allowed to sleep undisturbed by frequent recourse to the urine-bottle.

Here it is interesting to note that although ritual purgation has largely disappeared from the modern practice of medicine, it unaccountably lingers in the treatment of acute food-poisoning. The initial dose of salts, or, *horribile dictu*, of castor oil, is still very commonly dispensed, though how the agitated intestine, already acutely inflamed and pouring forth fluid in an all-out effort to get rid of the offending bacteria, can be expected to welcome further chemical irritation is hard to see. A similar mystical belief in the virtues of magnesium sulphate in promoting "a free flow of bile" is responsible for its routine exhibition in such conditions as infective hepatitis. Epsom salts cause the gall-bladder to contract and to expel bile into the duodenum; but this is not likely to benefit inflamed liver-cells. The custom is based on ancient misconceptions of the pathogenesis of such disorders; yet it still persists.

In the matter of diet, superstition still plays an active part. The 1946 edition of a famous and justly popular British textbook of medicine admonishes its readers to forbid their hypertensive patients, among other things, "twice-cooked meat, salted and preserved meat, liver, kidneys, brains, sweetbreads, meat soup and gravies; seasonings of various kinds, and meat extractives." In fact, "all those articles of food which especially stimulate the cardiovascular system should be reduced, and proportionately to the degree of hypertension." On the other hand, "fish, poultry, game (not high), rabbit . . ." are permissible. Now, is there the slightest reliable evidence that the kind of food he eats makes the least difference to the patient with essential hypertension, so long as the total quantity is not excessive? What grounds are there for believing that certain articles of diet "especially stimulate the cardiovascular system"? Is not, in fact, all the foregoing a great deal of nonsense? Even supposing we can, by eliminating all protein foods, reduce our patient's blood-pressure a few millimetres, it is very doubtful if he will be any the better for it. It is the whole man that we must view, and not merely the minor variations of a column of mercury.

EXAMINING THE DIET

One might go further and ask whether we have reason to think that diet is of any real importance in those diseases which are not associated with gastro-intestinal dysfunction or with a definite upset of metabolism. Do our frequently elaborate dietary instructions serve, in most cases, any other purpose than to provide our patients with food for mutual gossip and discussion and, in wartime, with insoluble problems in catering? I do not believe that the enforced disappearance, due to rationing and food shortage, of finicking dietary régimes in the last few years has led to any appreciable increase in death or disease. In fact, I strongly suspect that many patients are the better for it. I have not observed, for example, that my peptic-ulcer patients relapse any more frequently since I perforce ceased to recommend a carefully selected diet for six months or longer, and now merely advise them to eat, within reason, whatever food they find does not disagree. On the contrary, they seem to be better; because no longer do they feel obliged to consider their stomach before all else, and to debate at every turn the "digestibility" of each dish before them. They cease to fuss and fad, to undernourish themselves by exaggerated dietary precautions, and to harass themselves with longings for unnecessarily forbidden fruit. They are no longer dialling TUM every few minutes, and their ulcers are duly carefree.

We are sometimes in danger of forgetting that the appetite, when not perverted by gluttony or hysterical asceticism, or falsely determined by injudicious medical advice, is a remarkably reliable guide to what is and what is not good for a sick person. If a uræmic patient should desire roast beef (an admittedly unlikely event), roast beef will do him no harm. If the case of infective hepatitis would like eggs and bacon, he should not be forbidden them. In most illnesses, especially if the patient be in hospital, anorexia, partly due to the illness perhaps, but more often the result of monotonous and unimaginative cookery, is a far more formidable obstacle to recovery than is the hypothetically injurious effect of protein and fat. That there are occasions when certain kinds of food must be withheld nobody will deny. The acute nephritic with severe oliguria will not respond well to a nitrogenous diet. But then he is in the highest degree unlikely to desire it. To withhold, however, protein foods from the patient with congestive heart-failure, on the very dubious grounds that such foods "increase metabolism and throw extra work on the heart," is entirely unjustifiable. One could adduce many other examples of such needless dietary restrictions. It is surely simple common sense that a patient who is eating the food he likes and enjoying it will be happier and will tend to recover more quickly than one who is condemned to a rigid, monotonous diet—a diet often based on armchair theory, or on dubious feeding experiments with rats, or simply on superstition, and bearing little or no relation to clinical reality. It is so easy to forbid; and the mere act of doing so gives an illusion of positive action which

---

* *Mumpsimus:* A traditional custom, obstinately adhered to however unreasonable it may be (O.E.D.).

† Compare the beliefs of Dr. Sangrado in *Gil Blas* (c. 1700).

University of Cambridge

At a congregation on August 3 the following degrees were conferred:

M.D.—K. G. Bergin, G. E. Burton, P. T. Cooper, E. M. Darmady, John Murray, A. M. Payne, A. C. Thackray, R. M. Todd.

M.B., B.Chir.—A. V. G. Bibby, B. H. Brock, J. A. Bulleid, I. F. J. Churchill-Davidson, L. W. Clarke, D. E. Cullington, P. L. M. Hartley, P. M. R. Hemphill, S. L. Hetherington, J. D. Lever, R. H. G. Lyne-Pirkis, R. W. J. Maclure, I. M. Ormerod, Roy Randell, C. E. D. Taylor, H. B. Whitmore (in person); D. M. C. Ainscow, G. S. Andrew, D. K. Briggs, E. H. W. Burt, H. C. Churchill-Davidson, J. W. Coleman, D. J. Crockett, P. S. Davis, J. R. B. Dixey, W. M. Edgar, A. C. Franks, J. B. Frost, T. C. Gibson, E. C. Glover, Leonhard Haas, A. W. I. Hall, P. S. Hall, W. J. Hay, Michael Hemming, E. M. James, K. E. Jefferson, A. G. Jessiman, G. L. Leathart, A. H. Littlewood, Cecil McIver, W. D. Mail, K. E. Marsh, E. P. G. Michell, D. T. Milnes, D. V. Milward, D. R. Morgan, Philip Rhodes, J. S. Rivers, O. C. A. Scott, J. G. Selwyn, Malcolm Shirley, D. R. Smith, J. S. Swallow, R. J. D. Temple, M. K. Towers, H. W. Trusted, Sam Vakil, John Vallance-Owen, Walter van't Hoff, D. R. Wallace-Jones, D. B. Wallis, W. R. Wardill, I. W. Whimster, Humphrey Whitmore, R. J. Williams (by proxy).

Titles of degrees were conferred on the following:

M.B., B.Chir.—C. M. E. Jones, G. A. Meigh, Mrs. M. H. Miller, Mrs. A. M. P. Pantin.

The E. G. Fearnsides scholarship has been awarded to Dr. Lionel Wolman.

University of Leeds

As announced recently, Dr. H. V. Dicks has been appointed to the new chair of psychiatry.

Dr. Dicks studied medicine at Cambridge University; he was a foundation scholar of St. John's College, where he took the natural sciences tripos. Later, he went to St. Bartholomew's Hospital, winning the Baly research scholarship, the Brackenbury scholarship in medicine, and the Kirkes gold medal. He qualified M.R.C.S. in 1926, and M.B. in 1927, when he also became a M.R.C.P., and graduated M.D. After holding appointments as house-physician at Bethlem Royal Hospital, and as house-physician, demonstrator in pathology, and chief assistant to a medical unit at St. Bartholomew's Hospital, he joined the staff of the Tavistock Clinic in 1928, becoming assistant medical director in 1930. The results of his work were published in 1939 under the title *Clinical Studies in Psychopathology* and in many contributions to the literature. In 1940 he left the E.M.S. to joint the Army, in which he served with the rank of lieut.-colonel. His work included studies of the psychological structure of German and National Socialist groups and communities in relation to military and political planning, and in 1945 he became consultant in psychiatry to the German personnel research section of the Control Commission. Since leaving the Army he has returned to the Tavistock Clinic, and has also joined the staff of the new Tavistock Institute of Human Relations.

University of Edinburgh

Dr. Richard Ellis has been appointed to the Edward Clark chair of child life and health, in succession to Prof. Charles McNeil, who is retiring on Sept. 30.

Dr. Ellis was educated at Leighton Park and at King's College, Cambridge. He qualified from St. Thomas's Hospital in 1926, and after holding house-appointments at St. Thomas's went to the United States, where he worked as a research fellow in pædiatrics at Harvard medical school in 1928 and 1929, and was intern at the Children's Hospital, Boston, Mass. After returning to this country he was registrar and first assistant to the children's department of the London Hospital. In 1930–31 he held a Wander research scholarship at Westminster Hospital, and thereafter went back to St. Thomas's as registrar in the children's department. In 1931 he graduated M.D. and became M.R.C.P. He was pathologist and inpatient's medical registrar to the Hospital for Sick Children, Great Ormond Street, before his appointment to the honorary staffs of the Infants' Hospital and of Guy's Hospital, where he is physician in charge of the children's department. With Dr. Audrey Russell (now Mrs. Ellis) he supervised the medical side of the evacuation of Basque children from Bilbao in 1937 during the civil war in Spain, and later he worked for Polish child refugees in Rumania and Hungary. Elected F.R.C.P. in 1939, he joined the Royal Air Force in 1940, and served, with the rank of wing-commander, in North Africa, Italy, and Belgium, being mentioned in despatches and appointed O.B.E. Dr. Ellis is editor of the *Archives of Disease in Childhood*, and has himself written extensively, particularly on nutritional and metabolic disorders and problems of development in infancy. He has lately joined central executive of the National Society for Prevention of Cruelty to Children.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. H. JACKSON BURROWS, F.R.C.S., 16, Park Square East, Regent's Park, N.W.1.

Mr. JOHN HOWKINS, F.R.C.S., 109, Harley Street, W.1. (Welbeck 7395—day; Wimbledon 1613—night.)

Dr. H. F. TURNEY, 53, Queen Anne Street, Cavendish Square, W.1.

Surgical Instruments Panel

A panel has been appointed by the Interdepartmental Committee on Scientific Instruments, with the objects of promoting the manufacture of surgical and dental instruments and of placing these industries on a sound economic basis. Questionaries have been sent to a number of manufacturers; any others who would like to assist with information should communicate with the secretary, Surgical and Dental Instrument Panel, room 507, Portland House, Tothill Street, London, S.W.1.

A Course at Cambridge

A fortnight's general refresher course will be held at Add brooke's Hospital, beginning on Oct. 14. This course open to medical officers released from the Forces, and National Health Insurance practitioners who will receive same allowances as are paid to doctors released from Services. Application should be made to Dr. A. C. D. F Trinity Hall, Cambridge. (Tel. 5047.)

Airborne Medical Society

A permanent Airborne Medical Society is being formed whose membership will be open to all medical and de officers who have been entitled to wear the *maroon* be Further information may be had from the hon. secretary, Mr. Guy Rigby-Jones, M.C., F.R.C.S.E., 63A, Belsize Pa Gardens, London, N.W.3.

Franco-Anglo-American Medical Society

The third quarterly meeting of this society will be held 11, Chandos Street, London, W.1, on Tuesday, Sept. at 2.30 P.M.; when Lord Horder will take the chair.

Ministry of Health

Mr. H. Symon has been appointed under-secretary *in the ministry, and Miss Enid Russell-Smith* an *addition* under-secretary in the health services division.

Dr. J. D. ROBERTSON, of the Courtauld institute of the Middlesex Hospital, is shortly leaving for the United States where he will lecture for the University of California at San Francisco and Los Angeles and will deliver a Mayo Foundation lecture at Rochester, Minn.

Medical Diary

AUGUST 25 TO 31

Thursday, 29th

EDINBURGH POSTGRADUATE LECTURES

4.30 P.M. (Royal Infirmary.) Dr. J. D. S. Cameron: Treatment of Amœbiasis.

Appointments

CLARKE, H. OSMOND, M.B. Dubl., F.R.C.S.: surgeon to the Lo Hospital, and asst. director of the orthopædic and acci dept.

DAVIDSON, J. ROMANES, M.D. Edin.: *medical superintendent* Orphan Homes of Scotland and Colony for Epileptics, Bri of Weir, Renfrewshire.

HANNESSON, HANNES, M.R.C.S.: medical superintendent, Croydon County Borough Sanatorium, North Cheam, Surrey.

KERSHAW, J. D., M.D. Lond., D.P.H.: M.O.H. and school M.O., Colchester, Essex.

Hospital for Sick Children, Great Ormond Street, London:

- ABERMAN, DAVID, M.D. Camb., D.A.: anæsthetist.
- BLAIR, L. G., M.R.C.S., D.M.R.E.: director, dept. of radiology.
- CREAK, E. MILDRED, M.D. Lond., M.R.C.P., D.P.M.: physician dept. of psychological medicine.
- EVANS, PHILIP, M.D. Manc., F.R.C.P.: physician to outpatients
- HENRY, T. C., M.R.C.S., L.D.S.: dental surgeon.
- KIERNANDER, F. B., M.B. Lond., M.R.C.P., D.M.R.E., D.PHYS.MED.: director, dept. of physical medicine.
- LUCAS, B. G. B., M.R.C.S., D.A.: anæsthetist.

Colonial Service:

- AUSTIN, T. A., L.R.C.P.I., D.T.M. & H., D.P.H.: D.M.S., Uganda.
- BASSETT, Captain T. H., M.B. Lond.: M.O., Tanganyika.
- BOSSMAN, J. E., L.R.C.P.: M.O., Gold Coast.
- BRODIE, ALISON G., M.B. Aberd.: M.O., Malaya.
- CAUCHI, F. J., M.D. Malta: M.O., Nigeria.
- CLARK, Major J., M.B., D.P.H.: M.O., Nigeria.
- DAVIES, Captain A. G. M., M.B. Brist.: M.O., Tanganyika.
- DAVIES, H. N., M.B. Edin., D.T.M.: medical specialist, Tanganyika.
- DRYDEN, S., M.B.: asst. M.O., Jamaica.
- DUNNETT, Major A. H., M.B. Aberd.: M.O., Gold Coast.
- DYKES, W. S., M.B. Glasg.: M.O., Malaya.
- ELBERT, J. J., M.B.E., M.B. Glasg.: M.O., Nigeria.
- FITTON, J. M., M.B. Leeds, F.R.C.S.: orthopædic surgeon, Mauritius.
- FRAZER, Major S. M., M.R.C.S.: M.O., Bermuda.
- GORDON, S. G., L.R.C.P.: M.O., Gambia.
- HOUSTON, Captain G. F., M.R.C.S.: M.O., Nigeria.
- JACKSON, Major G. C. A., M.B. Lond.: M.O., Northern Rhodesia.
- MCGARITY, J. F., M.B.: M.O., Malaya.
- THOMPSON, Captain D. E., M.B. Camb.: M.O., Tanganyika.
- TIMMIS, W. G., M.B. Lpool: M.O., Uganda.
- UPTON, Flight-Lieutenant B. H. B., M.B. Birm.: M.O., Fiji.
- VAN SOMEREN, Lieut.-Colonel R. K. A., F.R.C.S.E.: M.O., Kenya.
- WILLETT, K. C., M.R.C.S.: trypanosomiasis officer, Tanganyika.
- WRIGHT, Captain R.: M.O., Nyasaland.

Examining Factory Surgeons:

- JOBSON, C. F., M.R.C.S.: Trowbridge, Wilts.
- LLOYD, D. H., M.R.C.S.: Carmarthen.
- MAIN, B. CAMPDEN, M.R.C.S.: Earl's Colne, Essex.
- ROSS, M. S., M.B. Edin., F.R.C.S.E.: Hemsworth, Yorks.

MYTH AND MUMPSIMUS *

JOHN R. FORBES
M.D. Lond., M.R.C.P.
MEDICAL REGISTRAR, GUY'S HOSPITAL

ONE of the few advantages of world unrest is that it disturbs complacency and raises doubt. The last twenty years, filled as they have been with the strife of men and the clash of opposing ideologies, have seen in all fields of human activity greater changes in beliefs and greater questionings of dogmas than perhaps any other period of history. Such tendency to iconoclasm is clearly manifested in medicine. Where is the elaborate prescription of yesteryear, where the once universal ritual of purgation, where the quondam rigid line of distinction between "organic" and "functional" disease ? For very many years they survived destruction, but doubt has been too much for them, and now they join phlebotomy and exorcism in limbo. A like tendency is clear in surgery. The position of Fowler, for so long unassailed, is today seriously endangered (Spalding 1946). The emptiness of many traditional doctrines is being exposed, and Truth peeps out from the well of superstition and ignorance.

ELIMINATION OF TOXINS

Yet the myth and the mumpsimus in medicine die hard, as reference to almost any recent textbook or a visit to the wards of a modern hospital will show. For example, the traditional forcing of fluids upon patients (with or without pyrexia) in the hope of thereby "aiding in the elimination of toxins" is still a popular custom. It is important to be clear in this matter. The replacement of fluid lost from the body by a sweating, pyrexial patient is, of course, essential. It is equally necessary to maintain a free flow of urine when a drug such as a sulphonamide, capable, in too great concentration, of damaging the kidneys, is being given. But the conception of the body as some sort of involved water-closet, to be cleansed by flushing with copious draughts of Imperial drink, is quite out of date.† We have given up belabouring the colon with purgatives and douches, and the sweat glands with diaphoretics and hot baths, in this quixotic battle against elusive toxins. It is time that the kidneys were rescued from similar assaults, and the patient allowed to sleep undisturbed by frequent recourse to the urine-bottle.

Here it is interesting to note that although ritual purgation has largely disappeared from the modern practice of medicine, it unaccountably lingers in the treatment of acute food-poisoning. The initial dose of salts, or, *horribile dictu*, of castor oil, is still very commonly dispensed, though how the agitated intestine, already acutely inflamed and pouring forth fluid in an all-out effort to get rid of the offending bacteria, can be expected to welcome further chemical irritation is hard to see. A similar mystical belief in the virtues of magnesium sulphate in promoting "a free flow of bile" is responsible for its routine exhibition in such conditions as infective hepatitis. Epsom salts cause the gall-bladder to contract, and to expel bile into the duodenum ; but this is not likely to benefit inflamed liver-cells. The custom is based on ancient misconceptions of the pathogenesis of such disorders ; yet it still persists.

In the matter of diet, superstition still plays an active part. The 1946 edition of a famous and justly popular British textbook of medicine admonishes its readers to forbid their hypertensive patients, among other things, "twice-cooked meat, salted and preserved meat, liver, kidneys, brains, sweetbreads, meat soup and gravies ; seasonings of various kinds, and meat extractives." In fact, "all those articles of food which especially stimulate the cardiovascular system should be reduced, and proportionately to the degree of hypertension." On the other hand, "fish, poultry, game (not high), rabbit . . ." are permissible. Now, is there the slightest reliable evidence that the kind of food he eats makes the least difference to the patient with essential hypertension, so long as the total quantity is not excessive ? What grounds are there for believing that certain articles of diet "especially stimulate the cardiovascular system" ? Is not, in fact, all the foregoing a great deal of nonsense ? Even supposing we can, by eliminating all protein foods, reduce our patient's blood-pressure a few millimetres, it is very doubtful if he will be any the better for it. It is the whole man that we must view, and not merely the minor variations of a column of mercury.

EXAMINING THE DIET

One might go further and ask whether we have reason to think that diet is of any real importance in those diseases which are not associated with gastro-intestinal dysfunction or with a definite upset of metabolism. Do our frequently elaborate dietary instructions serve, in most cases, any other purpose than to provide our patients with food for mutual gossip and discussion and, in wartime, with insoluble problems in catering ? I do not believe that the enforced disappearance, due to rationing and food shortage, of finicking dietary régimes in the last few years has led to any appreciable increase in death or disease. In fact, I strongly suspect that many patients are the better for it. I have not observed, for example, that my peptic-ulcer patients relapse any more frequently since I perforce ceased to recommend a carefully selected diet for six months or longer, and now merely advise them to eat, within reason, whatever food they find does not disagree. On the contrary, they seem to be better ; because no longer do they feel obliged to consider their stomach before all else, and to debate at every turn the "digestibility" of each dish before them. They cease to fuss and fad, to undernourish themselves by exaggerated dietary precautions, and to harass themselves with longings for unnecessarily forbidden fruit. They are no longer dialling TUM every few minutes, and their ulcers are duly carefree.

We are sometimes in danger of forgetting that the appetite, when not perverted by gluttony or hysterical asceticism, or falsely determined by injudicious medical advice, is a remarkably reliable guide to what is and what is not good for a sick person. If a uræmic patient should desire roast beef (an admittedly unlikely event), roast beef will do him no harm. If the case of infective hepatitis would like eggs and bacon, he should not be forbidden them. In most illnesses, especially if the patient be in hospital, anorexia, partly due to the illness perhaps, but more often the result of monotonous and unimaginative cookery, is a far more formidable obstacle to recovery than is the hypothetically injurious effect of protein and fat. That there are occasions when certain kinds of food must be withheld nobody will deny. The acute nephritic with severe oliguria will not respond well to a nitrogenous diet. But then he is in the highest degree unlikely to desire it. To withhold, however, protein foods from the patient with congestive heart-failure, on the very dubious grounds that such foods "increase metabolism and throw extra work on the heart," is entirely unjustifiable. One could adduce many other examples of such needless dietary restrictions. It is surely simple common sense that a patient who is eating the food he likes and enjoying it will be happier and will tend to recover more quickly than one who is condemned to a rigid, monotonous diet—a diet often based on armchair theory, or on dubious feeding experiments with rats, or simply on superstition, and bearing little or no relation to clinical reality. It is so easy to forbid ; and the mere act of doing so gives an illusion of positive action which

---

* *Mumpsimus*: A traditional custom, obstinately adhered to however unreasonable it may be (O.E.D.).

† Compare the beliefs of Dr. Sangrado in *Gil Blas* (c. 1700).

University of Cambridge

At a congregation on August 3 the following degrees were conferred:

M.D.—K. G. Bergin, G. E. Burton, P. T. Cooper, E. M. Darmady, John Murray, A. M. Payne, A. C. Thackray, R. M. Todd.

M.B., B.Chir.—A. V. G. Bibby, B. H. Brock, J. A. Bulleid, I. F. J. Churchill-Davidson, L. W. Clarke, D. E. Cullington, P. L. M. Hartley, P. M. R. Hemphill, S. L. Hetherington, J. D. Lever, R. H. G. Lyne-Pirkis, R. W. J. Maclure, I. M. Ormerod, Roy Randell, C. E. D. Taylor, H. B. Whitmore (in person); D. M. C. Ainscow, G. S. Andrew, D. K. Briggs, E. H. W. Burt, H. C. Churchill-Davidson, J. W. Coleman, D. J. Crockett, P. S. Davis, J. R. B. Dixey, W. M. Edgar, A. C. Franks, J. B. Frost, T. C. Gibson, E. C. Glover, Leonhard Haas, A. W. I. Hall, P. S. Hall, W. J. Hay, Michael Hemming, E. M. James, K. E. Jefferson, A. G. Jessiman, G. L. Leathart, A. H. Littlewood. Cecil McIver, W. D. Mall, K. E. Marsh, E. P. G. Michell, D. T. Milnes, D. V. Milward, D. R. Morgan, Philip Rhodes, J. S. Rivers, O. C. A. Scott, J. G. Selwyn, Malcolm Shirley, D. R. Smith, J. S. Swallow, R. J. D. Temple, M. K. Towers, H. W. Trusted, Sam Vakil, John Vallance-Owen, Walter van't Hoff, D. R. Wallace-Jones, D. B. Wallis, W. R. Wardill, I. W. Whimster, Humphrey Whitmore, R. J. Williams (by proxy).

Titles of degrees were conferred on the following:

M.B., B.Chir.—C. M. E. Jones, G. A. Meigh, Mrs. M. H. Miller, Mrs. A. M. P. Pantin.

The E. G. Fearnsides scholarship has been awarded to Dr. Lionel Wolman.

University of Leeds

As announced recently, Dr. H. V. Dicks has been appointed to the new chair of psychiatry.

Dr. Dicks studied medicine at Cambridge University; he was a foundation scholar of St. John's College, where he took the natural sciences tripos. Later, he went to St. Bartholomew's Hospital, winning the Baly research scholarship, the Brackenbury scholarship in medicine, and the Kirkes gold medal. He qualified M.R.C.S. in 1926, and M.B. in 1927, when he also became a M.R.C.P., and graduated M.D. After holding appointments as house-physician at Bethlem Royal Hospital, and as house-physician, demonstrator in pathology, and chief assistant to a medical unit at St. Bartholomew's Hospital, he joined the staff of the Tavistock Clinic in 1928, becoming assistant medical director in 1930. The results of his work were published in 1939 under the title *Clinical Studies in Psychopathology* and in many contributions to the literature. In 1940 he left the E.M.S. to joint the Army, in which he served with the rank of lieut.-colonel. His work included studies of the psychological structure of German and National Socialist groups and communities in relation to military and political planning, and in 1945 he became consultant in psychiatry to the German personnel research section of the Control Commission. Since leaving the Army he has returned to the Tavistock Clinic, and has also joined the staff of the new Tavistock Institute of Human Relations.

University of Edinburgh

Dr. Richard Ellis has been appointed to the Edward Clark chair of child life and health, in succession to Prof. Charles McNeil, who is retiring on Sept. 30.

Dr. Ellis was educated at Leighton Park and at King's College, Cambridge. He qualified from St. Thomas's Hospital in 1926, and after holding house-appointments at St. Thomas's went to the United States, where he worked as a research fellow in pædiatrics at Harvard medical school in 1928 and 1929, and was intern at the Children's Hospital, Boston, Mass. After returning to this country he was registrar and first assistant to the children's department of the London Hospital. In 1930–31 he held a Wander research scholarship at Westminster Hospital, and thereafter went back to St. Thomas's as registrar in the children's department. In 1931 he graduated M.D. and became M.R.C.P. He was pathologist and inpatient's medical registrar to the Hospital for Sick Children, Great Ormond Street, before his appointment to the honorary staffs of the Infants' Hospital and of Guy's Hospital, where he is physician in charge of the children's department. With Dr. Audrey Russell (now Mrs. Ellis) he supervised the medical side of the evacuation of Basque children from Bilbao in 1937 during the civil war in Spain, and later he worked for Polish child refugees in Rumania and Hungary. Elected F.R.C.P. in 1939, he joined the Royal Air Force in 1940, and served, with the rank of wing-commander, in North Africa, Italy, and Belgium, being mentioned in despatches and appointed O.B.E. Dr. Ellis is editor of the *Archives of Disease in Childhood*, and has himself written extensively, particularly on nutritional and metabolic disorders and problems of development in infancy. He has lately joined central executive of the National Society for Prevention of Cruelty to Children.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. H. JACKSON BURROWS, F.R.C.S., 16, Park Square East, Regent's Park, N.W.1.
Mr. JOHN HOWKINS, F.R.C.S., 109, Harley Street, W.1. (Welbeck 7395—day; Wimbledon 1613—night.)
Dr. H. F. TURNEY, 53, Queen Anne Street, Cavendish Square, W.1.

Surgical Instruments Panel

A panel has been appointed by the Interdepartmental Committee on Scientific Instruments, with the objects of promoting the manufacture of surgical and dental instruments and of placing these industries on a sound economic basis. Questionaries have been sent to a number of manufacturers; any others who would like to assist with information should communicate with the secretary, Surgical and Dental Instrument Panel, room 507, Portland House, Tothill Street, London, S.W.1.

A Course at Cambridge

A fortnight's general refresher course will be held at Ad brooke's Hospital, beginning on Oct. 14. This cours open to medical officers released from the Forces, and National Health Insurance practitioners who will receive same allowances as are paid to doctors released from Services. Application should be made to Dr. A. C. D. F Trinity Hall, Cambridge. (Tel. 5047.)

Airborne Medical Society

A permanent Airborne Medical Society is being for whose membership will be open to all medical and de officers who have been entitled to wear the maroon be Further information may be had from the hon. secret Mr. Guy Rigby-Jones, M.C., F.R.C.S.E., 63A, Belsize Pa Gardens, London, N.W.3.

Franco-Anglo-American Medical Society

The third quarterly meeting of this society will be held 11, Chandos Street, London, W.1, on Tuesday, Sept. at 2.30 P.M.; when Lord Horder will take the chair.

Ministry of Health

Mr. H. Symon has been appointed under-secretary in the ministry, and Miss Enid Russell-Smith as under-secretary in the health services division.

Dr. J. D. ROBERTSON, of the Courtauld institute of th Middlesex Hospital, is shortly leaving for the United Sta where he will lecture for the University of California a San Francisco and Los Angeles and will deliver a Ma Foundation lecture at Rochester, Minn.

Medical Diary

AUGUST 25 TO 31

Thursday, 29th

EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (Royal Infirmary.) Dr. J. D. S. Cameron: Treatm of Amœbiasis.

Appointments

CLARKE, H. OSMOND, M.B. Dubl., F.R.C.S.: surgeon to the Lo Hospital, and asst. director of the orthopædic and acc dept.
DAVIDSON, J. ROMANES, M.D. Edin.: medical superintend Orphan Homes of Scotland and Colony for Epileptics, Bri of Weir, Renfrewshire.
HANNESSON, HANNES, M.R.C.S.: medical superintendent, Croyd County Borough Sanatorium, North Cheam, Surrey.
KERSHAW, J. D., M.D. Lond., D.P.H.: M.O.H. and school M. Colchester, Essex.

Hospital for Sick Children, Great Ormond Street, London:
- ASERMAN, DAVID, M.D. Camb., D.A.: anæsthetist.
- BLAIR, L. G., M.R.C.S., D.M.R.E.: director, dept. of radiolo
- CREAK, E. MILDRED, M.D. Lond., M.R.C.P., D.P.M.: phys dept. of psychological medicine.
- EVANS, PHILIP, M.D. Manc., F.R.C.P.: physician to outpati
- HENRY, T. C., M.R.C.S., L.D.S.: dental surgeon.
- KIERNANDER, F. B., M.B. Lond., M.R.C.P., D.M.R.E., D.PHYS.M: director, dept. of physical medicine.
- LUCAS, B. G. B., M.R.C.S., D.A.: anæsthetist.

Colonial Service:
- AUSTIN, T. A., L.R.C.P.I., D.T.M. & H., D.P.H.: D.M.S., Ugan
- BASSETT, Captain T. H., M.B. Lond.: M.O., Tanganyika.
- BOSSMAN, J. E., L.R.C.P.: M.O., Gold Coast.
- BRODIE, ALISON G., M.B. Aberd.: M.O., *Malaya*.
- CAUCHI, F. J., M.D. Malta: M.O., Nigeria.
- CLARK, Major J., M.B., D.P.H.: M.O., Nigeria.
- DAVIES, Captain A. G. M., M.B. Brist.: M.O., Tanganyika.
- DAVIES, H. N., M.B. Edin., D.T.M.: medical specialist, Tangan
- DRYDEN, S., M.B.: asst. M.O., Jamaica.
- DUNNETT, Major A. H., M.B. Aberd.: M.O., Gold Coast.
- DYKES, W. S., M.B. Glasg.: M.O., Malaya.
- ELBERT, J. J., M.B.E., M.B. Glasg.: M.O., Nigeria.
- FITTON, J. M., M.B. Leeds, F.R.C.S.: orthopædic surg Mauritius.
- FRAZER, Major S. M., M.R.C.S.: M.O., Bermuda.
- GORDON, S. G., L.R.C.P.: M.O., Gambia.
- HOUSTON, Captain G. F., M.R.C.S.: M.O., Nigeria.
- JACKSON, Major G. C. A., M.B. Lond.: M.O., Northern Rhode
- McGARITY, J. F., M.B.: M.O., Malaya.
- THOMPSON, Captain D. E., M.B. Camb.: M.O., Tanganyika.
- TIMMIS, W. G., M.B. Lpool: M.O., Uganda.
- UPTON, Flight-Lieutenant B. H. B., M.B. Birm.: M.O., Fiji.
- VAN SOMEREN, Lieut.-Colonel R. K. A., F.R.C.S.E.: M.O., Ken
- WILLETT, K. C., M.R.C.S.: trypanosomiasis officer, Tanganyi
- WRIGHT, Captain R.: M.O., Nyasaland.

Examining Factory Surgeons:
- JOBSON, C. F., M.R.C.S.: Trowbridge, Wilts.
- LLOYD, D. H., M.R.C.S.: Carmarthen.
- MAIN, B. CAMPDEN, M.R.C.S.: Earl's Colne, Essex.
- ROSS, M. S., M.B. Edin., F.R.C.S.E.: Hemsworth, Yorks.

terrified valetudinarians. So perhaps for the present it may be wise for us to continue to tell our rheumatic cardiacs that they have indeed got a murmur, but that there is no need for them on that account to consider themselves invalids.

We try, therefore, not to miss early valvular heart disease, and we spend a lot of time teaching its importance to students. But we are so morbidly afraid of over-oking its presence that we often commit the worse ror of diagnosing heart disease when none exists. The ung man with a functional systolic murmur, who gives history of ten days' "rheumatism" in childhood, whose other died of some vague "heart trouble," and who ows an inverted T-wave in the third lead of his electro-rdiogram, is almost certain to be diagnosed sometime having rheumatic heart disease, though he probably is perfectly normal healthy individual. Such a diagnosis ay have a devastating effect upon a suggestible youth, ading to a cardiac neurosis which may result in a life f useless semi-invalidism. Such an error is at least as reat as that of failing to detect a carcinoma in a man of ixty. Nowadays, with so much emphasis on the preven-ive aspect of medicine and the early diagnosis of ymptomless disease, there is a danger that we may orget the reverse of the coin—the perils of the erroneous iagnosis of disease-less symptoms. Let us not, in voiding the scylla of the overlooked cancer, fall into the harybdis of the medically-induced ‡ neurosis. The first nay be fatal to life, the second fatal to happiness.

CHOICE OF DRUGS

Consideration of drug therapy at once brings to mind a profusion of myths. A few drugs are of proved and nassailable value, and their mode of action established. Some are useful, and their mode of action may be partly understood. Many are almost certainly worthless, and their mode of action mythical. Yet all have their ardent advocates; and to question the traditional pharmaceutical rites is to raise a storm of unprofitable controversy. Some of the more useless preparations should be pensioned off into honourable obscurity, while others should be partially retired. Glucose, for example, will always have its deserved place in therapeutics, but its value and importance have been greatly overestimated. Many physicians do not seem to appreciate that the sole advantage of glucose over other forms of sugar, when given by mouth, is that it is less sweet and can thus be taken in larger quantities without producing nausea. It is commonly believed that by giving a monosaccharide all ready for absorption, a favour is conferred on the alimentary tract; whereas the digestive apparatus, however ill its owner, is quite capable of producing the same end-result with no trouble, and with none of the additional expense. Furthermore, the indiscriminate employment of glucose in all varieties of hepatic disorder is quite pointless. The origin of this custom, and of many other similar therapeutic traditions, is the ignorant misapplication to human beings of quasi-scientific animal experiments. It is a practice unfortunately on the increase as the habit of bedside observation declines and the reverence for non-clinical research grows. There is but one criterion of the value of any therapeutic procedure: does it, however attractive in theory or successful with guineapigs, really work with patients?

It would be wearisome to recount in detail all the many traditional customs in therapeutics whose rationale is most dubious, and whose practical value is negligible. Some have been mentioned already. The prescription of massage and exercises, without diet, as a means of reducing obesity; the faith in milk as a food suitable for every patient and almost every disease, though large numbers of adults loathe it; the routine swathing in cotton-wool of the chests of perspiring pneumonia patients, "lest they catch cold"—these and many other methods of treatment are based on theorising from inadequate experimental data, on the ancient error of arguing from the particular to the general, or on no apparent rational thought-process at all. Too few physicians take the trouble to ask themselves if such methods are of any real value in practice. John Hunter said all this many years ago in three words: "Don't think; try." The object of this polemic is to sow the seeds of doubts—healthy, constructive, scientific, doubts. We do so many things in medicine from traditional custom, handed down to us by our teachers when we were students and copied unthinkingly from one textbook to another. We are so used to doing them that we seldom stop to think whether our actions are dictated by reason or by superstition. If we do, we probably comfort ourselves by reflecting that they must be of some value, or they would not be so widely practised or so long-lived. That this assumption is entirely unjustified is shown by the many similar faiths, such as leeching and blistering, which survived and were universally practised for centuries, and yet have now been totally discarded.

A traditional custom may be very valuable. Many empirical procedures have later been shown to have a sound scientific basis. To refuse to employ a method of treatment of proved practical value because its rationale is as yet obscure is foolishly narrow-minded. But it behoves us to keep our practice of medicine in constant repair; to drag out the old customs from the cellar from time to time, and to examine them critically in the light of day. One will be found to be still useful, and to produce good results even if its modus operandi be not yet fully understood. Another will be revealed as a mere mumpsimus, and fit only for the dustbin.

PSYCHONEUROSIS

A final word on a modern myth which is rapidly being established. "Anxiety state" or "anxiety neurosis," applied indiscriminately as a label to all sorts of psychological upsets, is today the successor of the older "neurasthenia" as a species of diagnostic portmanteau. An anxiety state is a definite emotional condition, and its presence or absence is determined by a simple question: does the patient manifest anxiety? If not, then whatever psychological ailment he may have, it is not an anxiety state. The unjustifiably widespread use of the term is due, in large measure, to an unnecessary feeling of compulsion on the part of the physician to give the patient a diagnostic label. This passion for pigeon-holing is nowhere more ill-directed than in psychological medicine. Disordered emotions are peculiarly individual, and defy the procrustean diagnostic method. The result of such glib labelling is merely to confuse the ætiological issue, and to hinder a clear understanding of the principles of treatment.

In recent years there has grown up a commendable awareness of the importance and ubiquity of psychological factors in disease. Psychology and psychiatry are no longer the poor relations of medicine. But before we non-experts label a patient anxiety state, obsessional neurosis, hysteria, or (fashionable nowadays) psychosomatic disorder, let us be quite sure that we know what we mean by these terms, and whether we are justified in using one of them in any particular instance. Otherwise their true and precise meaning will become perverted, and we shall have opened up a new chapter in the mythology of medicine.

I am indebted to Dr. W. N. Mann and to Dr. M. A. Partridge for valuable suggestions and merciless criticism of this paper.

REFERENCES

British Medical Journal (1946) i, 921.
Cohen, S. (1946) *Lancet*, July 6, p. 1.
Spalding, J. E. (1946) *Ibid*, i, 643.

---

‡ A more elegant, though unfamiliar, epithet is "iatrogenic" (ἰατρός = physician; γένεσις = creation).

is soothing to the harassed physician, in despair of an excuse for interference in a disease which has no proved remedy. It is true that in many cases mild prohibitions in the matter of diet do no harm, and satisfy the patient's demand for action on the part of his medical adviser. But let us *not thereby be led into believing that our diets* have necessarily done any good, and arrogate to ourselves credit which properly belongs to the *vis medicatrix naturæ*. It is permissible sometimes to practise harmless deception on our patients for their own good: it is never permissible to deceive ourselves.

These remarks apply with almost equal force to the use of tobacco and alcohol. Do we, when we lightly forbid these amiable vices in our older patients, give enough thought to how we are depriving them of much-needed solace in their declining years, and adding to the winter *of their discontent*? When "use" becomes "abuse" it is a different question, and most of the controversy rages round the dividing line between the two. The moral aspect still further confuses the issue. But to forbid smoking and drinking to our patients without substantial reason if not cruel is useless, because in nine cases out of ten we shall not be obeyed.

The forced overfeeding of patients with normal appetites, such as was formerly practised on consumptives, is as foolish as underfeeding. The custom is waning, but its place threatens to be filled by the habit of indiscriminate exhibition of vitamins. There can be few patients with "neuritis" who have not received large but futile doses of aneurine, and not many with chronic skin diseases who have not swallowed ascorbic acid ad nauseam, all to little or no purpose. The mythical healing properties attributed to vitamins by now far exceed their very real ones.

TRADITION IN NURSING

In the field of nursing care the traditional custom is very strong. That this is in part due to the essential conservativeness of women is likely, but most of the blame must rest upon ourselves, because, as Cohen (1946) has pointed out, we fail to keep our nursing staffs informed of recent advances in therapeutics. It would be tedious to detail all the innumerable small traditional superstitions that are sedulously observed in every hospital and nursing-home. It is hardly credible that, until the blitz swept it away, it was the invariable custom in one of the major London teaching hospitals to close the operating-theatre after a death on the table (from whatever cause), in order to carry out a semi-religious rite of complete cleansing and fumigation. By this means, presumably, evil spirits were driven out and the soul of the departed exorcised. In most medical wards the patient with acute rheumatism or acute nephritis is invariably deprived of sheets and nursed between blankets, whatever the state of his sweat glands. One has only to remove the sheets from one's own bed on a warm night to appreciate the tickling discomfort that this procedure entails. The acute rheumatic or diphtheria patient is further harassed by being compelled to lie flat on his back in bed with one pillow, or even with none at all—a posture sometimes psychologically desirable for and fairly well tolerated by children, but one of considerable discomfort for adults. Decubitus in disease should be determined primarily by the patient's comfort and not by vague theorising on the part of his physician. Again, if our patient requires an enema, it will still be compounded of soap, turpentine, treacle, ox-bile, or some such rectal irritant, though the complete efficacy of normal saline was proved *long ago*.

It is our shame that we are often so ignorant of nursing methods that we are unaware of the existence of these and other outmoded manœuvres; or, worse still, we dismiss them, with a shrug and a tolerant smile, as harmless fads. Admittedly they are not lethal practices. But they cause needless discomfort to patients or cre purposeless work for nurses, and should be tactfully firmly discouraged, even in the teeth of hostile wa sisters.

The undesirability of overlong immobilisation of ol patients has, in recent years, become more wid appreciated. The dangers of venous thrombosis and passive pulmonary congestion, and the difficulties re-mobilising stiffened joints and muscles, today le physicians to get their patients with, say, corona thrombosis up and about earlier than they used to. younger people, however, the risks of prolonged decubit are perhaps not so fully realised, because they are psych logical rather than physical. Sometimes such und prolongation arises from the mistaken belief that "normal" temperature, of not more than 99° F, is essential preliminary to the patient's getting up. As t *British Medical Journal* recently (1946) pointed o temperatures of 100° F or even more are occasiona compatible with perfect health, particularly if the patie be of tense, nervous temperament. Granted that su "pyrexia," especially during convalescence from a illness, should call for careful exclusion of lingerin organic disease; but if a reasonable search has been mad and has proved negative, and if the patient has n complaints, it is surely wiser to let him get up (when th "*pyrexia*" will *often* subside) than *to* keep him in be indefinitely. Yet the latter practice is by no mean uncommon, despite the possible harm to a suggestibl adolescent, through sowing the seed of a persisten hypochondria in later life.

ATTACHING A LABEL

A similar common and harmful error is to diagno anæmia in children or young adults when no su condition exists. Anæmia is a definite disorder, whi can be identified, if present, by a simple blood-cou The indiscriminate use of the term to disguise ignoran of the true cause of the patient's complaints, and t *prolonged* and *useless dosing* with *iron* and liver th follows, cannot be too strongly deprecated. The ad lescent girl who is pale, who will not eat, and who fain easily, is in all probability working too hard at school an pining with unrequited love for her form-mistress. Bland pills will not cure her. But in later life all her littl hypochondriacal ailments and psychological upsets m be firmly attributed by her to "anæmia as a child."

All this arises from our exaggerated fear of overlook organic disease. We have all had it drummed into us students that to miss an early carcinoma is an unpardo able error. So it is. But what we often fail to real is the profound psychological harm we may do diagnosing organic disease where none exists. Nowhe is this more clearly shown than in the field of hea disease. We congratulate ourselves when we de the early mitral diastolic murmur in the symptomle young woman about to have her first baby. Yet sometimes wonders whether it really matters very mu With symptomless rheumatic heart disease, do we fact succeed, by all our fussing and frowning on ov exertion, in prolonging life or, more important, enhancing its enjoyment? Would not such patients happier and probably live just as long (provided th were not engaged in some freakishly strenuous occupatio if they remained in blissful ignorance of their steno valve and fibrosed myocardium till the day when ignorance was no longer possible? We do not, if we wise, inform our symptomless hypertensives of the st of their blood-pressure. Should we not apply the sa rule to our rheumatic-heart patients? Unfortunatel there is a snag. If we do not tell them ourselves, soon or later someone else will. And he may do so in th wrong way, suggesting to them, *perhaps, that they* on the brink of death, and thereby turning them in rified valetudinarians. So perhaps for the present may be wise for us to continue to tell our rheumatic rdiacs that they have indeed got a murmur, but that ere is no need for them on that account to consider emselves invalids.

We try, therefore, not to miss early valvular heart sease, and we spend a lot of time teaching its importance students. But we are so morbidly afraid of overoking its presence that we often commit the worse ror of diagnosing heart disease when none exists. The oung man with a functional systolic murmur, who gives history of ten days' "rheumatism" in childhood, whose other died of some vague "heart trouble," and who ows an inverted T-wave in the third lead of his electroardiogram, is almost certain to be diagnosed sometime s having rheumatic heart disease, though he probably is perfectly normal healthy individual. Such a diagnosis ay have a devastating effect upon a suggestible youth, ading to a cardiac neurosis which may result in a life f useless semi-invalidism. Such an error is at least as reat as that of failing to detect a carcinoma in a man of ixty. Nowadays, with so much emphasis on the preventive aspect of medicine and the early diagnosis of ymptomless disease, there is a danger that we may orget the reverse of the coin—the perils of the erroneous iagnosis of disease-less symptoms. Let us not, in voiding the scylla of the overlooked cancer, fall into the harybdis of the medically-induced[‡] neurosis. The first may be fatal to life, the second fatal to happiness.

CHOICE OF DRUGS

Consideration of drug therapy at once brings to mind a profusion of myths. A few drugs are of proved and unassailable value, and their mode of action established. Some are useful, and their mode of action may be partly understood. Many are almost certainly worthless, and their mode of action mythical. Yet all have their ardent advocates; and to question the traditional pharmaceutical rites is to raise a storm of unprofitable controversy. Some of the more useless preparations should be pensioned off into honourable obscurity, while others should be partially retired. Glucose, for example, will always have its deserved place in therapeutics, but its value and importance have been greatly overestimated. Many physicians do not seem to appreciate that the sole advantage of glucose over other forms of sugar, when given by mouth, is that it is less sweet and can thus be taken in larger quantities without producing nausea. It is commonly believed that by giving a monosaccharide all ready for absorption, a favour is conferred on the alimentary tract; whereas the digestive apparatus, however ill its owner, is quite capable of producing the same end-result with no trouble, and with none of the additional expense. Furthermore, the indiscriminate employment of glucose in all varieties of hepatic disorder is quite pointless. The origin of this custom, and of many other similar therapeutic traditions, is the ignorant misapplication to human beings of quasi-scientific animal experiments. It is a practice unfortunately on the increase as the habit of bedside observation declines and the reverence for non-clinical research grows. There is but one criterion of the value of any therapeutic procedure: does it, however attractive in theory or successful with guineapigs, really work with patients?

It would be wearisome to recount in detail all the many traditional customs in therapeutics whose rationale is most dubious, and whose practical value is negligible. Some have been mentioned already. The prescription of massage and exercises, without diet, as a means of reducing obesity; the faith in milk as a food suitable for every patient and almost every disease, though large numbers of adults loathe it; the routine swathing in cotton-wool of the chests of perspiring pneumonia patients, "lest they catch cold"—these and many other methods of treatment are based on theorising from inadequate experimental data, on the ancient error of arguing from the particular to the general, or on no apparent rational thought-process at all. Too few physicians take the trouble to ask themselves if such methods are of any real value in practice. John Hunter said all this many years ago in three words: "Don't think; try." The object of this polemic is to sow the seeds of doubts—healthy, constructive, scientific, doubts. We do so many things in medicine from traditional custom, handed down to us by our teachers when we were students and copied unthinkingly from one textbook to another. We are so used to doing them that we seldom stop to think whether our actions are dictated by reason or by superstition. If we do, we probably comfort ourselves by reflecting that they must be of some value, or they would not be so widely practised or so long-lived. That this assumption is entirely unjustified is shown by the many similar faiths, such as leeching and blistering, which survived and were universally practised for centuries, and yet have now been totally discarded.

A traditional custom may be very valuable. Many empirical procedures have later been shown to have a sound scientific basis. To refuse to employ a method of treatment of proved practical value because its rationale is as yet obscure is foolishly narrow-minded. But it behoves us to keep our practice of medicine in constant repair; to drag out the old customs from the cellar from time to time, and to examine them critically in the light of day. One will be found to be still useful, and to produce good results even if its modus operandi be not yet fully understood. Another will be revealed as a mere mumpsimus, and fit only for the dustbin.

PSYCHONEUROSIS

A final word on a modern myth which is rapidly being established. "Anxiety state" or "anxiety neurosis," applied indiscriminately as a label to all sorts of psychological upsets, is today the successor of the older "neurasthenia" as a species of diagnostic portmanteau. An anxiety state is a definite emotional condition, and its presence or absence is determined by a simple question: does the patient manifest anxiety? If not, then whatever psychological ailment he may have, it is not an anxiety state. The unjustifiably widespread use of the term is due, in large measure, to an unnecessary feeling of compulsion on the part of the physician to give the patient a diagnostic label. This passion for pigeon-holing is nowhere more ill-directed than in psychological medicine. Disordered emotions are peculiarly individual, and defy the procrustean diagnostic method. The result of such glib labelling is merely to confuse the ætiological issue, and to hinder a clear understanding of the principles of treatment.

In recent years there has grown up a commendable awareness of the importance and ubiquity of psychological factors in disease. Psychology and psychiatry are no longer the poor relations of medicine. But before we non-experts label a patient anxiety state, obsessional neurosis, hysteria, or (fashionable nowadays) psychosomatic disorder, let us be quite sure that we know what we mean by these terms, and whether we are justified in using one of them in any particular instance. Otherwise their true and precise meaning will become perverted, and we shall have opened up a new chapter in the mythology of medicine.

I am indebted to Dr. W. N. Mann and to Dr. M. A. Partridge for valuable suggestions and merciless criticism of this paper.

REFERENCES

British Medical Journal (1946) i, 921.
Cohen, S. (1946) *Lancet*, July 6, p. 1.
Spalding, J. E. (1946) *Ibid*, i, 643.

[‡] A more elegant, though unfamiliar, epithet is "iatrogenic" (ἰατρός = physician; γένεσις = creation).

MEDICAL PHOTOGRAPHY

A REVIEW

PETER HANSELL
M.R.C.S., A.R.P.S.
From the Department of Medical Photography, Westminster Hospital, London

THE application of photography to medicine is by no means new; in line with the development of other applications, photography has been used as a recording medium in the practice of medicine since very early days. Indeed, the fact that books on photomicrography appeared as early as 1872 might serve as a rebuke to us today; for, though there have been advances, these have been quite sporadic, and still the subject lacks coördination and integration. In this respect we have much to learn from the advances made in other countries, notably the United States of America. A consideration of the quality of American work has tended to make many workers in this country critical of their own methods, and this in turn has led to the realisation that medical photography can no longer be done in a backstair cupboard.

To meet the requirements of complicated modern techniques, a veritable photographic laboratory is necessary, and there must be opportunity for photographic, besides medical, research. It is probably the appreciation of the scope of a modern department which has led to the abandonment of the older term "clinical photography," for its bedside implications were somewhat limiting.

Whereas photography was first introduced into hospitals and teaching institutions as a recording medium, this function has now become somewhat subservient. With the development of the epidiascope and other projectors, the tendency today is to regard photography as the means whereby knowledge may be disseminated in a visual form. Obviously, routine records must form a valuable source of such material, but the development of visual methods of education and the tremendous impetus given to this subject by the recent war need no elaboration here. This tendency is substantiated by the appearance of articles in the current journals on the subject of medical films; and, though we must welcome the display of such an interest, it would be as well to bear in mind that it has grown up totally without relationship to the development of medical photography as a whole; it therefore does not conform to a set plan, and is a trifle premature.

The establishment of a new hospital department prompted an investigation of the field, so that benefit might be derived from the experience of other workers. So far this survey has been confined to the main teaching hospitals in the London area. It has been slow and is by no means complete, for at the outset a major difficulty was experienced—that of tracing workers engaged in medical photography. Once this difficulty had been partially overcome, discussions on the subject of staff, training, salaries, equipment, and techniques were possible. The resultant information, though limited, is not without interest, and already many obstacles in the path of better medical photography have become apparent. The aim here, therefore, is to review and present some of the common difficulties, in the hope that they will be of value to those interested in advancing the subject.

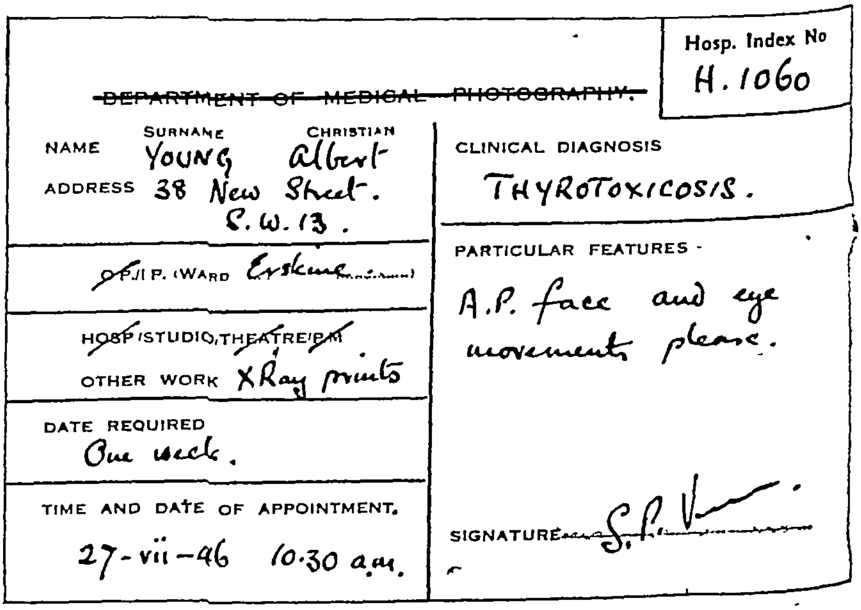
ACCOMMODATION

Lack of suitable accommodation is perhaps the greatest single drawback to the natural development of a hospital photographic department, to say nothing of the demoralising effect which such conditions have on the people who work therein. Work in cramped staff quarters soon becomes a drudge, even if initial enthusiasm is enough to withstand such inconveniences. Few enough members of hospital committees are conversant with the processes which go to make a finished photograph, and hence are quite unaware of the intensely tiring effect of working in an ill-ventilated dark-room. The idea that any old cupboard was good enough in the pioneer days seems to have remained unchanged by the passage of time. Against this, one is, however, painfully aware of the cramped conditions in which most hospital workers have found themselves in the last few years, but in these days of planning and rebuilding it is as well to remember that, for the photographic staff to enjoy any degree of comfort, at least four rooms are essential—two dark-rooms and two small studios, one of the latter being set aside for special techniques such as photomicrography, X-ray reduction, copying of documents, and so on.

EQUIPMENT

Hand in hand with accommodation goes the consideration of equipment; only here both funds and accommodation are limiting factors. Experience has shown that medical photographers are extremely resourceful people; further, they are willing to suffer inconvenience caused by the absence of an elaborate piece of equipment—such difficulties are classically surmounted by the judicious use of plasticine and string. With the hospital carpenter as an ally, many efficient contrivances have been evolved, though the ideas have rarely been disseminated.

This state of affairs raises several interesting points. It would be interesting to know, for instance, if such resourcefulness is a necessary quality of a medical photographer, or whether it has merely been inbred through years of vain striving for more apparatus. Furthermore, it has in the past been difficult for the



Hosp. Index No
H. 1060

~~DEPARTMENT OF MEDICAL PHOTOGRAPHY.~~

NAME SURNAME YOUNG CHRISTIAN Albert
ADDRESS 38 New Street. S.W.13.

~~O~~P/I P. (WARD Erskine)

~~HOSP~~/STUDIO/~~THEATRE/PM~~
OTHER WORK X Ray prints

DATE REQUIRED
One week.

TIME AND DATE OF APPOINTMENT.
27-vii-46 10.30 a.m.

CLINICAL DIAGNOSIS
THYROTOXICOSIS.

PARTICULAR FEATURES -
A.P. face and eye movements please.

SIGNATURE

Fig. 1 (front).
Specimen request form in the shape of a standard filing card 6 in. by 4 in.

edical photographer to publish his ideas, even had he she so desired—the photographic and medical press ve offered little space for such a limited subject. nally, in this connexion, attention should be drawn to e fact that most hospitals are reluctant to spend what ems to them to be vast quantities of money on photo-aphic apparatus. Often they will not be convinced that otographic equipment depreciates but little if carefully ndled, and is therefore to be regarded more as a pital investment. Where the swing of the pendulum s been in the other direction, and a department boasts hundreds of pounds' worth of equipment, a careful rutiny will often reveal the fact that such expenditure as undertaken in a fit of aberration, and that little or o attention has been paid to basic requirements: the test American endoscopic camera may be found, but an ccurate exposure meter is deemed unnecessary.

FILING

In the light of these somewhat limited investigations, owever, there seem to be one or two common failings, nd one or two lines which, were they exploited, would ad to the setting up of a much more efficient and useful ervice. Deserving of special mention in this respect is he question of filing systems, for at the outset one can e dogmatic and state that, where the products of a nedical photographic department are to be used in onnexion with teaching, any money expended on filing ystems forms the most solid single investment. So mportant is this question that a more detailed considera-ion is merited. Broadly speaking, three distinct types f request may be made of the photographic department t any time: (1) for work to be executed—the patient's ame, hospital index number, and diagnosis may or may ot be supplied; (2) for reprints or duplicates of work one in the past, when the same information, though ften of doubtful accuracy, may be to hand; and (3) for eprints or reproductions of all work executed in the ast three or four years on such and such a disease. It is this latter type of request which is of paramount impor-ance to the teacher or author, and yet which renders seless all but the most comprehensive filing systems.

Clearly then, a most rigorous cross-check must be kept on such information as patient's name, index number, disease, photographic data, and filing number. Besides which, it may not be realised that copyright laws are applicable in a limited sense, so that a record should be kept of the name of the attendant physician or surgeon. This point need not be laboured, for it is obviously desirable from an ethical standpoint. The recording of these details does not involve as much office work as might be supposed; a system which has been found to work in practice has as its foundation the request form, a printed card with spaces for data on both sides, and measuring 6 in. by 4 in. to fit a standard card-index cabinet (fig. 1). Apart from the initial annoyance attendant on the birth of any new form, full cooperation from the hospital staff may reasonably be expected.

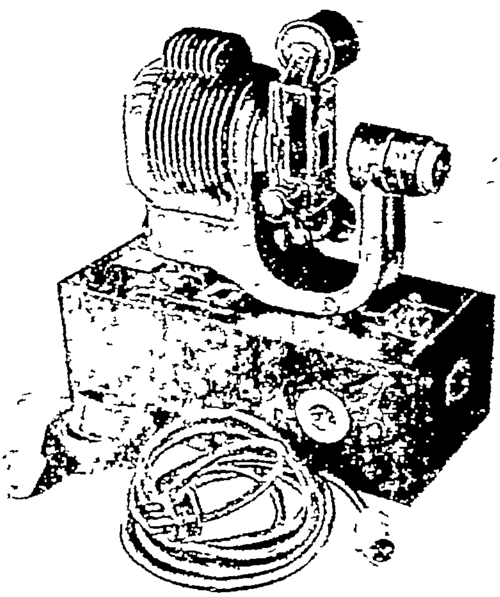


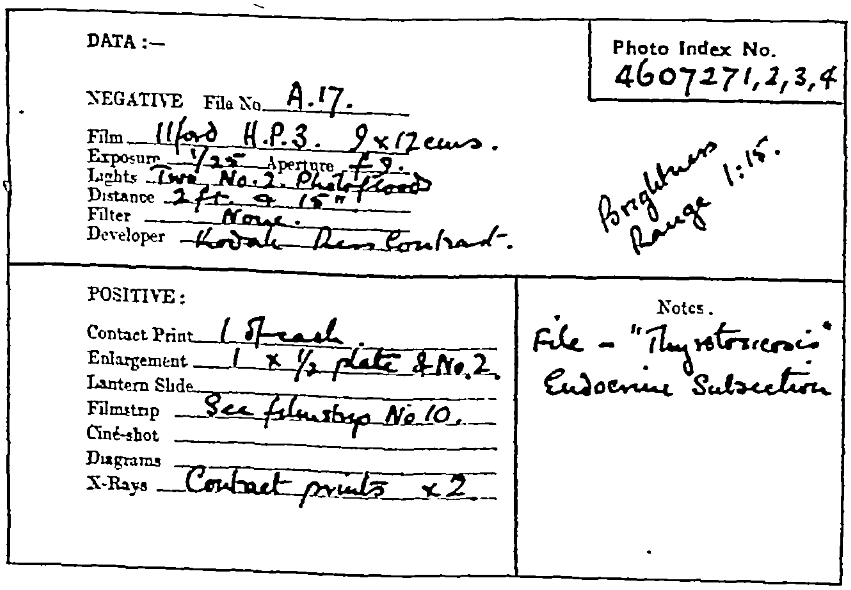
Fig. 2—A filmstrip projector.

In parallel with this, the necessity of a subject-index catalogue or file has been mentioned. If teaching material is to be always ready to hand, it would seem reasonable to keep duplicate prints of all work executed, so that these may be permanently available for inspection and can, in the course of time, indicate deficiencies in the complete recording of cases. If this idea should be rejected on the grounds of the additional expense involved—though it should be remembered that filing copies need only be small—it is essential to compile some classified manuscript record to achieve the same objects, if only in part.

At the risk of appearing tedious, the office work has been emphasised because experience has shown it to be the weakest link in the chain which extends from doctor to photographic department, and from photographic department to teacher or author. Only too often has one seen good photographic records descend into the dusty basement with discarded case-histories, and, as counterparts, the unclassified negatives on the shelves of the photographic department.

FILMSTRIP

A new medium which has recently been launched in all its splendour on the educational world is the 35-mm. filmstrip. This particular medium has been in existence since the acceptance of the 35-mm. miniature camera,



DATA :—

Photo Index No. 4607271,2,3,4

NEGATIVE File No. A.17.
Film Ilford H.P.3. 9×12 cms.
Exposure 1/25 Aperture f.9.
Lights Two No.2. Photofloods
Distance 2 ft. 9 15"
Filter None.
Developer Kodak Dens Contrast.

Brightness Range 1:15.

POSITIVE:
Contact Print 1 Spread
Enlargement 1 × ½ plate & No.2.
Lantern Slide
Filmstrip See filmstrip No 10.
Ciné-shot
Diagrams
X-Rays Contact prints × 2

Notes.
File – "Thyrotoxicosis"
Endocrine Subsection

Fig. 1 (back).

MEDICAL PHOTOGRAPHY

A REVIEW

PETER HANSELL
M.R.C.S., A.R.P.S.
From the Department of Medical Photography, Westminster Hospital, London

THE application of photography to medicine is by no means new; in line with the development of other applications, photography has been used as a recording medium in the practice of medicine since very early days. Indeed, the fact that books on photomicrography appeared as early as 1872 might serve as a rebuke to us today; for, though there have been advances, these have been quite sporadic, and still the subject lacks coordination and integration. In this respect we have much to learn from the advances made in other countries, notably the United States of America. A consideration of the quality of American work has tended to make many workers in this country critical of their own methods, and this in turn has led to the realisation that medical photography can no longer be done in a backstair cupboard.

To meet the requirements of complicated modern techniques, a veritable photographic laboratory is necessary, and there must be opportunity for photographic, besides medical, research. It is probably the appreciation of the scope of a modern department which has led to the abandonment of the older term "clinical photography," for its bedside implications were somewhat limiting.

Whereas photography was first introduced into hospitals and teaching institutions as a recording medium, this function has now become somewhat subservient. With the development of the epidiascope and other projectors, the tendency today is to regard photography as the means whereby knowledge may be disseminated in a visual form. Obviously, routine records must form a valuable source of such material, but the development of visual methods of education and the tremendous impetus given to this subject by the recent war need no elaboration here. This tendency is substantiated by the appearance of articles in the current journals on the subject of medical films; and, though we must welcome the display of such an interest, it would be as well to bear in mind *that it has grown up totally without relationship to the* development of medical photography as a whole; it therefore does not conform to a set plan, and is a trifle premature.

The establishment of a new hospital department prompted an investigation of the field, so that benefit might be derived from the experience of other workers. So far this survey has been confined to the main teaching hospitals in the London area. It has been slow and is by no means complete, for at the outset a major difficulty was experienced—that of tracing workers engaged in medical photography. Once this difficulty had been partially overcome, discussions on the subject of staff, training, salaries, equipment, and techniques were possible. The resultant information, though limited, is not without interest, and already many obstacles in the path of better medical photography have become apparent. The aim here, therefore, is to review and present some of the common difficulties, in the hope that they will be of value to those interested in advancing the subject.

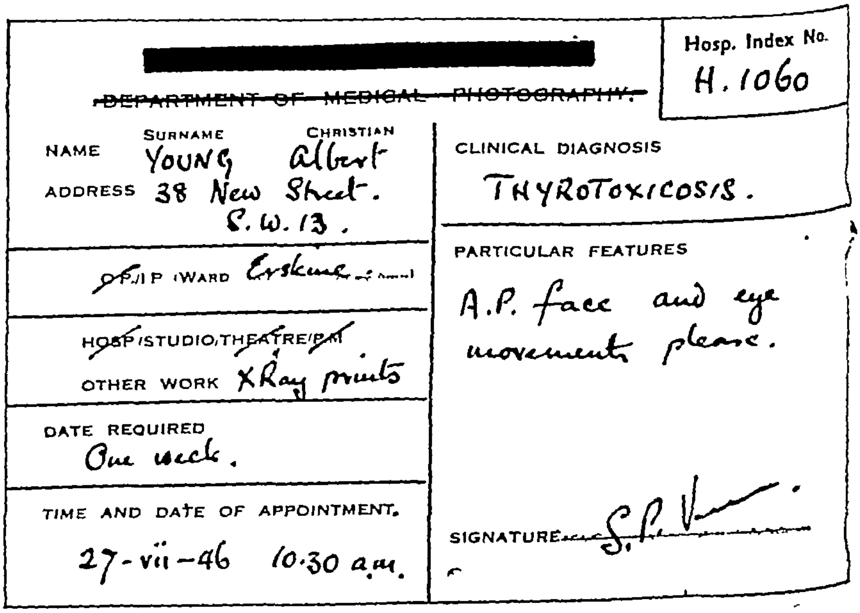
ACCOMMODATION

Lack of suitable accommodation is perhaps the greatest single drawback to the natural development of a hospital photographic department, to say nothing of the demoralising effect which such conditions have on the people who work therein. Work in cramped stuffy quarters soon becomes a drudge, even if initial enthusiasm is enough to withstand such inconveniences. Few enough members of hospital committees are conversant with the processes which go to make a finished photograph, and hence are quite unaware of the intensely tiring effect of working in an ill-ventilated dark-room. The idea that any old cupboard was good enough in the pioneer days seems to have remained unchanged by the passage of time. Against this, one is, however, painfully aware of the cramped conditions in which most hospital workers have found themselves in the last few years, but in these days of planning and rebuilding it is as well to remember that, for the photographic staff to enjoy any degree of comfort, at least four rooms are essential—two dark-rooms and two small studios, one of the latter being set aside for special techniques such as photomicrography, X-ray reduction, copying of documents, and so on.

EQUIPMENT

Hand in hand with accommodation goes the consideration of equipment; only here both funds and accommodation are limiting factors. Experience has shown that medical photographers are extremely resourceful people; further, they are willing to suffer inconvenience caused by the absence of an elaborate piece of equipment—such difficulties are classically surmounted by the judicious use of plasticine and string. With the hospital carpenter as an ally, many efficient contrivances have been evolved, though the ideas have rarely been disseminated.

This state of affairs raises several interesting points. It would be interesting to know, for instance, if such resourcefulness is a necessary quality of a medical photographer, or whether it has merely been inbred through years of vain striving for more apparatus. Furthermore, it has in the past been difficult for the



[redacted]
~~DEPARTMENT OF MEDICAL PHOTOGRAPHY.~~

Hosp. Index No. H. 1060

NAME SURNAME YOUNG CHRISTIAN Albert
ADDRESS 38 New Street. S.W. 13.

~~O.P.~~/I.P. WARD Erskine

~~HOSP~~/STUDIO/~~THEATRE/P.M.~~
OTHER WORK X Ray prints

DATE REQUIRED One week.

TIME AND DATE OF APPOINTMENT. 27-vii-46 10.30 a.m.

CLINICAL DIAGNOSIS THYROTOXICOSIS.

PARTICULAR FEATURES A.P. face and eye movements please.

SIGNATURE

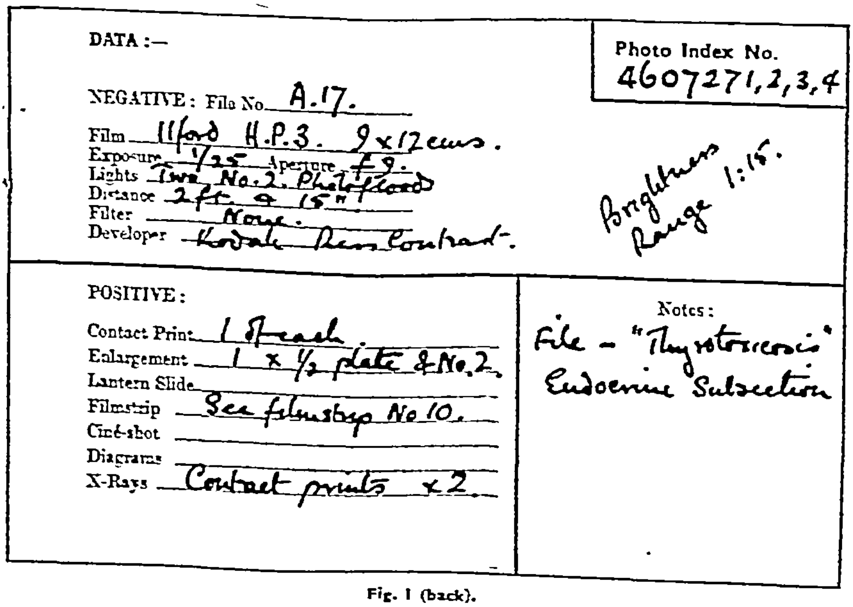
Fig. 1 (front).
Specimen request form in the shape of a standard filing card 6 in. by 4 in.

edical photographer to publish his ideas, even had he r she so desired—the photographic and medical press ave offered little space for such a limited subject. inally, in this connexion, attention should be drawn to he fact that most hospitals are reluctant to spend what eems to them to be vast quantities of money on photo-raphic apparatus. Often they will not be convinced that hotographic equipment depreciates but little if carefully andled, and is therefore to be regarded more as a apital investment. Where the swing of the pendulum as been in the other direction, and a department boasts f hundreds of pounds' worth of equipment, a careful crutiny will often reveal the fact that such expenditure vas undertaken in a fit of aberration, and that little or o attention has been paid to basic requirements: the atest American endoscopic camera may be found, but an ccurate exposure meter is deemed unnecessary.

FILING

In the light of these somewhat limited investigations, however, there seem to be one or two common failings, and one or two lines which, were they exploited, would ead to the setting up of a much more efficient and useful ervice. Deserving of special mention in this respect is the question of filing systems, for at the outset one can be dogmatic and state that, where the products of a medical photographic department are to be used in connexion with teaching, any money expended on filing systems forms the most solid single investment. So important is this question that a more detailed consideration is merited. Broadly speaking, three distinct types of request may be made of the photographic department at any time: (1) for work to be executed—the patient's name, hospital index number, and diagnosis may or may not be supplied; (2) for reprints or duplicates of work done in the past, when the same information, though often of doubtful accuracy, may be to hand; and (3) for reprints or reproductions of all work executed in the past three or four years on such and such a disease. It is this latter type of request which is of paramount importance to the teacher or author, and yet which renders useless all but the most comprehensive filing systems.

Clearly then, a most rigorous cross-check must be kept on such information as patient's name, index number, disease, photographic data, and filing number. Besides which, it may not be realised that copyright laws are applicable in a limited sense, so that a record should be kept of the name of the attendant physician or surgeon. This point need not be laboured, for it is obviously desirable from an ethical standpoint. The recording of these details does not involve as much office work as might be supposed; a system which has been found to work in practice has as its foundation the request form, a printed card with spaces for data on both sides, and measuring 6 in. by 4 in. to fit a standard card-index cabinet (fig. 1). Apart from the initial annoyance attendant on the birth of any new form, full cooperation from the hospital staff may reasonably be expected.



DATA :—

Photo Index No. 4607271,2,3,4

NEGATIVE: File No. A.17.
Film Ilford H.P.3. 9 x 12 cms.
Exposure 1/25 Aperture f.9.
Lights Two No. 2. Photofloods
Distance 2 ft. @ 15"
Filter None.
Developer Kodak Low Contrast.

Brightness Range 1:15.

POSITIVE:
Contact Print 1 of each
Enlargement 1 x ½ plate & No. 2.
Lantern Slide
Filmstrip See filmstrip No 10.
Ciné-shot
Diagrams
X-Rays Contact prints x 2.

Notes:
File – "Thyrotoxicosis" Endocrine Subsection

Fig. 1 (back).

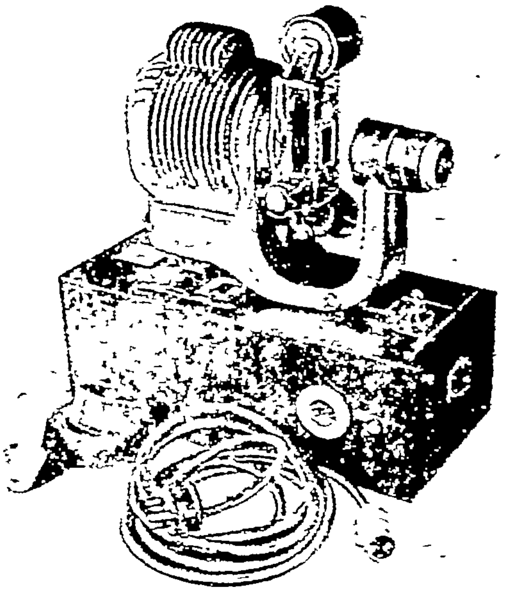


Fig. 2—A filmstrip projector.

In parallel with this, the necessity of a subject-index catalogue or file has been mentioned. If teaching material is to be always ready to hand, it would seem reasonable to keep duplicate prints of all work executed, so that these may be permanently available for inspection and can, in the course of time, indicate deficiencies in the complete recording of cases. If this idea should be rejected on the grounds of the additional expense involved—though it should be remembered that filing copies need only be small—it is essential to compile some classified manuscript record to achieve the same objects, if only in part.

At the risk of appearing tedious, the office work has been emphasised because experience has shown it to be the weakest link in the chain which extends from doctor to photographic department, and from photographic department to teacher or author. Only too often has one seen good photographic records descend into the dusty basement with discarded case-histories, and, as counterparts, the unclassified negatives on the shelves of the photographic department.

FILMSTRIP

A new medium which has recently been launched in all its splendour on the educational world is the 35-mm. filmstrip. This particular medium has been in existence since the acceptance of the 35-mm. miniature camera,

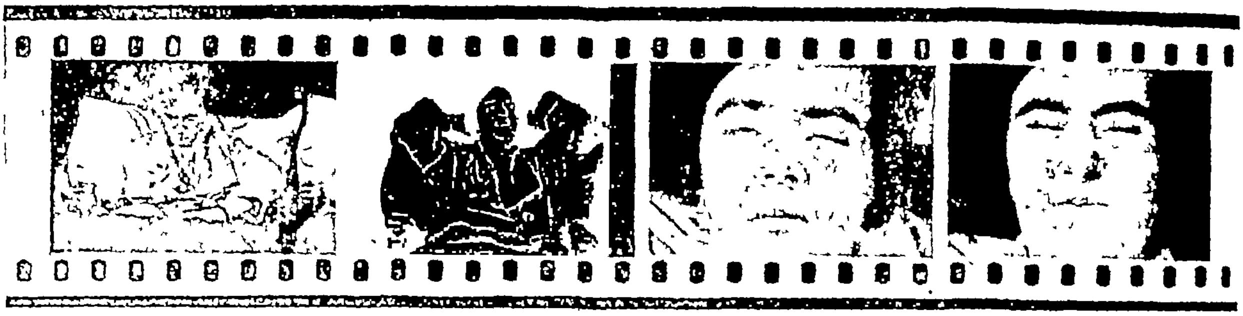


Fig. 3—Four frames from a typical 35-mm. filmstrip, showing patient with myasthenia gravis before and after injection of 'Prostigmin.'

but it is the war years which have been responsible for its development—today there are numerous commercial firms in existence whose sole purpose it is to produce filmstrips of a high order, and even these are still in their infancy, for it was demands made from the Services which were largely responsible for their creation.

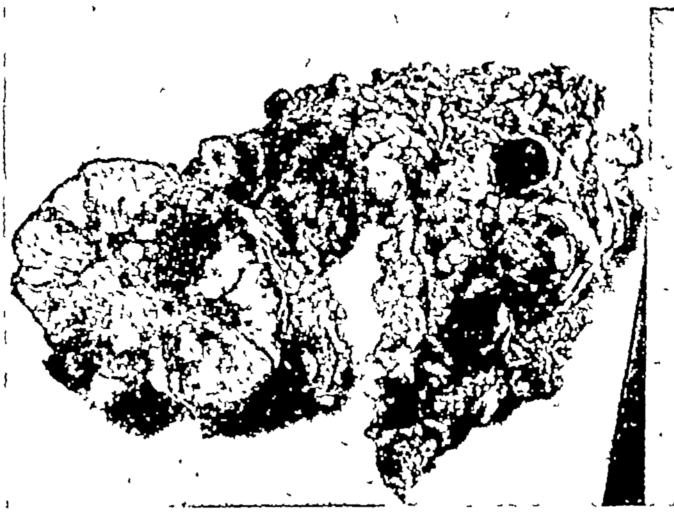
Up to now, filmstrip does not seem to have found a place in medical education, despite its great potentialities which have been proved in part. As has already been intimated, there is nothing new or mysterious about this medium; users of miniature cameras have been accustomed to making little rolls of transparencies for projection purposes, these constituting the crudest filmstrips. In the strictest sense of the term, a filmstrip is a roll of standard 35-mm. positive film, on which is printed a series of pictures, radiograms, or diagrams in a definite sequence, with a view to presenting a logical story of the subject in question; when such a strip is intended for individual viewing, and is not accompanied by a verbal commentary, the necessary labels and subcaptions may be included in the frame.

It must be admitted that a higher standard of workmanship is necessary to produce blemish-free miniature pictures, whether in strip or slide form, than in the case of lantern-slides (3¼ in. sq.), but still the method has much to commend it. Standard lantern-slides are heavy, bulky, fragile, and expensive, whereas filmstrip is free from these factors, which tend to impede a more general use. Filmstrip is cheap to produce; it is small in bulk and light to carry, a roll of 40 pictures being lighter and smaller than a single standard lantern-slide. One objection which might be raised is the fact that the order of the pictures or frames has necessarily to be predetermined; but, if such a strip is prepared to a script, this should not present a real difficulty. In any case, when the negatives have been produced, they may be printed in any order, or, alternatively, the strip may be divided into its composite frames, which are then mounted as miniature lantern-slides.

Filmstrip projectors are very small and compact, and may easily be carried from room to room as the need arises. Their construction is such that a darkened room, though advisable, is by no means essential. As a further suggestion, such filmstrips could, after being used for lectures, be filed in a library with suitable notes, so that students might at any time view them with an individual reader. It would be as well, therefore, for medical photographers to watch the development of the filmstrip industry and familiarise themselves with the techniques involved in their production, and so apply this comparatively new medium to their own uses in the near future (see figs. 2 and 3).

DISPLAY

As has been indicated throughout this article, the scope of hospital photographic departments has been



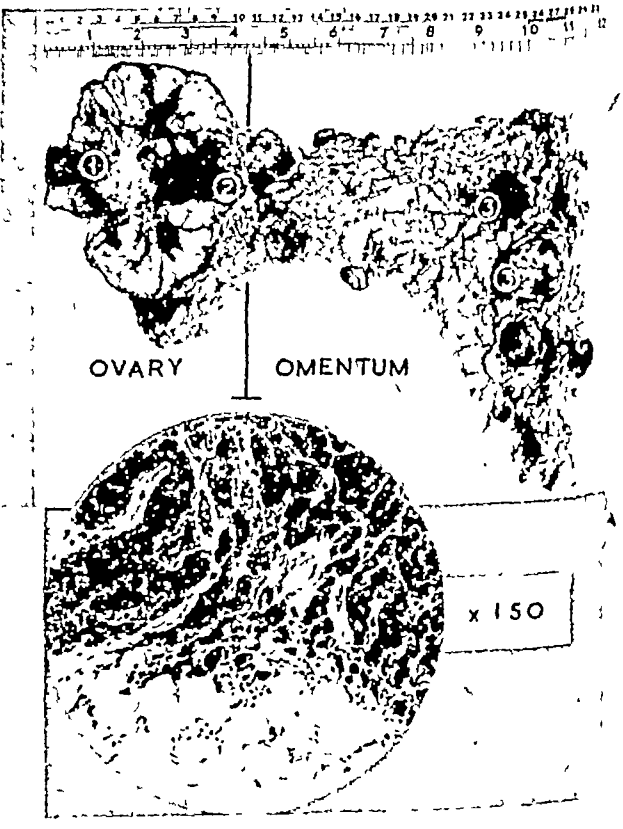


Fig. 4—Operation specimen of ovary and attached omentum: (a) a bad but conventional photograph; (b) same specimen showing its size and morbid histology; (1) metastatic carcinoma completely taking the place of ovarian tissue; (2) hæmorrhagic areas; (3) secondary nodules in omentum.

remely limited up to now. Little or no use has been le of display. Static displays of photographs and rbid specimens with appended notes can be of isiderable value to the student. They form an easily imilable source of information; and, with a little operation from the curator of the hospital museum, would be possible to arrange for such displays to changed at regular intervals. In this manner it possible, for instance, to present a complete record of a rticular case, whether rare or common, from the time patient first attends, through the results of special vestigations, to the logical conclusion, whether this the necropsy room or a return to normal.

To facilitate this type of presentation, it is obviously advantage to have the services of an artist, for the ntinuity between stages is not always at first apparent, it can more readily be made so by the inclusion of mple keys and diagrams. A visit to any exhibition of ientific photography will convince even the most eptical that medical photographers are, and can be, sourceful enough to produce displays independently. he fact remains, however, that the place for these isplays is in the medical school, and not so much in the chibition hall.

MORBID SPECIMENS

While on this subject, we might digress for a moment consider the age-old problem of the photography of iorbid specimens. Such photographs obviously play n important part in displays of the type outlined above, nd yet how often do we see such a photograph of this ature which conveys any real information? As students, we must all have experienced our teachers showing hotographs of specimens which they had actually seen r removed, and yet which, without such a preview, onveyed no information save that of a tangled mass of emains. It is true that the photography of morbid pecimens is not without some difficult aspects, but how nuch more valuable such a record becomes if a little are is exercised in the final presentation. The inclusion f arrows, labels, and scales requires very little extra rouble, and makes all the difference between a good and bad record (fig. 4*a* and *b*).

MEDICAL PHOTOGRAPHERS

We have now traced the story and shortcomings of medical photography to date, but what of the future? Many hospitals are seeking to establish new departments; but even if they have the equipment and the accommodation, how are these departments to be staffed? And what inducements are there for people to take up medical photography as a career?

Many men and women leaving the Forces are attracted by hospital work, but, having decided that they would like to undertake training in the subject, find it difficult to progress beyond this decision. There is no room in this specialised field for a person without a good photographic training, and institutions which provide courses of instruction in pure photography are already booked to capacity. A further difficulty is that there are no set standards up to which a medical photographer shall be trained, either in terms of medical or photographic knowledge, and no examinations exist to test their final proficiency in the subject. One or two commercial firms run short training courses of instruction, but prospective participants are faced with the danger of a particular commercial bias being instilled into them during the course of their training; and, even so, it is doubtful if such courses are complete enough to prove of lasting value.

It is probable that the Institute of British Photographers will, in the near future, devote a section of their final examination to the subject of medical photography; indeed, such a step would be highly desirable. But, if the standards of this examination demand a lengthy and complete training, as they should, it is doubtful if people would be persuaded to undertake long and expensive training when, at the end of it, they would receive only mediocre salaries.

The medical photographer is essentially highly skilled and is expected to be conversant with more techniques than he would be in any other branch of photography. It is reasonable, therefore, to suppose that his remuneration should be at least on the same level as that of a photographer employed commercially.

The whole problem is, however, a vicious circle, since hospitals, quite rightly, do not expect to pay high salaries to semi-skilled workers; and, in the absence of the standards alluded to, it is difficult to decide on the degree of skill achieved at any one time in the course of an apprenticeship.

In addition to these purely academic considerations, one notes with interest that the Royal Photographic Society has recently set up a medical group which should be of interest to all medical photographers and doctors interested in photography. It is to be hoped that, with this backing, many instructive meetings may be held which will permit a healthy interchange of ideas among workers in this field. But such a state of affairs can only be achieved if the group receives all the support it deserves.

One can only conclude, therefore, on a note of hope: that the post-war years will see standards of training laid down for medical photographers, and the establishment of training courses comparable with those open to workers in the United States, and that the achievement of these desiderata will be reflected in the quality of medical illustrations in the future.

SUMMARY

A brief review of medical photography up to the present day is given.

A few of the main difficulties encountered in a recent incomplete survey of the field are mentioned.

Filmstrip as a comparatively new teaching medium is described and illustrated, and its application to medical education is emphasised.

The necessity for training courses and training standards is briefly discussed, and present facilities are mentioned.

THE HOSPITAL PHOTOGRAPHIC DEPARTMENT

BRIAN STANFORD
M.R.C.S., D.M.R., F.R.P.S.

THE principles of photography, long conducted empirically, are now firmly established on a scientific basis. Parallel with this transformation has been the development of a scientific application of photographic technique: the camera is now used both as an accurate recording instrument and as an instrument of research. These developments, though potentially of great value to medical science, have not yet penetrated into our practice, which still presents a huge unexplored field for applied photography.

This paper outlines the functions and requirements of a clinical photographic department which exploits fully all the potentialities that photography can offer medicine. It is appreciated that the proposals are too ambitious for immediate realisation in full, but departments can be set up now within the framework outlined, and built up steadily until all these possibilities are realised.

Photographs which recall to individual memory a particular condition are no longer adequate records for a clinic with constantly changing personnel. Photographs must provide an absolute image to the mind of a doctor who has never seen the patients before; they must even provide an absolute image to a doctor who has never seen a similar complaint before. Photographs must provide an accurate basis for measurement: the orthopædic clinic desires more accurate evidence of returning mobility in a stiff joint than is provided by a variable protractor resting on soft tissue; the cancer clinic desires more accurate evidence of alteration in size of a lesion than is provided by a ruler bridged across an area of indefinite edge. Photographs must provide an accurate record of change in subjective appearance: the psychiatric clinic desires regular portraits to show change in facial expressions; the hormone clinic desires regular records of bodily configuration to show effect of treatment; the welfare department desires portraits to show return of a healthy glow to the cheeks of a convalescent. Photographs must provide accurate evidence to the laboratory worker, whose researches may extend over several generations of experimental animals with a short life-span. The list is endless.

STANDARDISATION

All this can easily be achieved with suitable equipment, careful work, and recognised standardising techniques. The aim of any clinical photographic department must be to produce, after an interval of hours, days, or years, a record of a condition which is indistinguishable from the first in every respect—except that the lesion itself has changed. But standardisation of this kind, that is to say repeatability of conditions, is not sufficient of itself. *It is equally important that, given two lesions,* whether of the same nature or not, occupying the same relative position on two different individuals, the two records are identical except for the clinical differences they portray. Such a state of affairs demands an even greater degree of standardisation; for, besides the duplication of conditions required by the first example, we now require to have laid down standard techniques for photographing different areas of the body.

These techniques will therefore have to stipulate: (1) the angle of view at which the camera is pointing in relation to the area of the body presented; (2) the distance of the camera; (3) the disposition of the lights in the same way; (4) the nature of the lighting; (5) the colour-to-monochrome distortion convention (or the colour error introduced); and (6) the contrast convention. These requirements can be met by recording angles and distances accurately; noting the type of light-source and reflector used; including in the field of view a rule, a neutral grey-scale, and a colour-chart; and controlled developing and printing which produces, as a matter of routine, prints with matched grey-scales.

Furthermore, one view will not be sufficient; each standardised technique will demand at least two views, lighting conditions or colour-to-monochrome distortions to provide a basis for differential evaluation; and one or more of these views may be a stereoscopic pair. The grey-scales, rule, and colour-scale will be included on every print. This is not to suggest that a special view may not also be desirable; it often will be, but the standard views must also be presented in every case.

These may seem extravagant requirements, but comparable conditions are accepted practice in radiology. Every fracture is recorded from two or more angles under standardised conditions of angulation and distortion scale (anode-film distance), stereoscopic pairs are often asked for, foreign bodies are sought by taking radiographs at two different penetrations, and so on. There are, in fact, many large volumes devoted to radiographic standardising techniques.

But out of all this emerges a principle new to clinical photography. Once standardised techniques are accepted for certain areas, and once the doctors who use the records have become accustomed to the conventions, they will have achieved a state comparable to that to which they are accustomed in radiology. The records, read in conjunction and against a background of experience of records made in an identical manner, will have a meaning of their own; these records will, in fact, evoke a real image in the mind of a person who has not yet seen the condition they record. When that state of affairs is reached, photography will have become a useful adjunct to medicine.

VALID TEACHING MATERIAL

It is clear that in time sufficient material will accrue from the activities outlined above to provide pictorial examples of most clinical conditions. Moreover, since the students will have been educated to recognise the conventions adopted in these standardising techniques, they can be presented with records of conditions of which they have never seen the like and still derive a real image from them. This is a greater consideration than many experienced teachers can realise; they are prone to present as an illustration of a condition a record which successfully reminds them of the case it represents but is meaningless to the student. But the hospital photographic department will not stop there. It will make, for teaching purposes, records with a different emphasis.

For example, standardised records of a direct, an indirect, and a femoral hernia will be of value in each patient's notes, but for teaching purposes each will have to be presented alongside the other corrected in this instance not to original scale but reduced or magnified so that the pubic-spine to iliac-crest distance is identical on the paper on all three records.

Again, for clinical purposes still photographs will be taken more often than cinematograph, and slides will rarely be needed; but, for teaching students, many films, slides, and filmstrips, will be specially made.

he medical staff. It will prepare teaching material quest; for this purpose an extensive cross-reference system will be maintained. It will have direct s to the wards, and record, with the consent of the or in charge, such conditions as are needed to increase reference section, besides conditions of which it es experience to evolve new standardising techniques. hermore, it will constantly evolve new recording niques for record and research in conjunction with other departments.

time this department will have achieved sufficient rience to justify its taking in students of clinical tography, and so increase not only the internal iency of its hospital but also the range of public ices provided by that hospital.

ORGANISATION

taff.—The director will be medically qualified but osen for his photographic knowledge and experience. will be under his guidance that the department proves s usefulness, and a man with untried ideas will be of reater worth than one who wishes to practise currently cognised techniques.

The assistant director, who will possess a degree in hysics or chemistry, will also be selected for his photographic knowledge and experience. He will bring to he department a more precise scientific outlook than oes the medical director, and contribute to the general esearch activities of the department the knowledge in hich he has qualified.

The two photographers will be trained nurses. They will possess a keen interest in photography, but may be aught detailed technique during the early activity of the department. They must be carefully selected in the full ealisation that in a few years they will leave the department and found a new one elsewhere.

A microscopist will be a qualified fellow of the Institute of Medical Laboratory Technicians with special experience of histology and bacteriology. He will be given an additional training in photomicrography such as is given by, for instance, the Royal College of Science and Technology, and will be expected to contribute advances to photomicrographic technique.

Though much of the routine photographic procedure will be undertaken by all the members of the staff, a dark-room technician will relieve them of excessive routine duties and ensure continuity of output.

A secretary will control the requests, maintain the files, and attend to disposal of the records made.

A cineradiography technician, a qualified radiographer, will be given special instruction in photographic techniques and will be maintained by this department jointly with the diagnostic radiology department.

An instrument mechanic, capable of making fine optical instruments from rough designs, will be essential to the progress of the department. He will require first-class equipment, and may possibly be shared with the radiotherapy or the clinical pathology development departments.

A nurse and a porter will be attached in their professional capacities to the department.

Some members of the staff here outlined will be difficult to obtain, for a department such as is described will be unique to begin with. There is no doubt, however, that the right persons will be attracted to the posts, for the steady development of the specialised appointment of hospital physicist shows that people do exist ready to apply knowledge of one field to another, with great benefit to both. In selecting personnel there need be no discrimination of sex for any of the posts. The guiding principle will be the selection of people with tact and a kindly outlook; for, though experience shows that patients are usually fully coöperative, yet sensitive people exist who feel that in some way they are being laughed at if a photograph is asked for; the photographic department must never give cause for this suspicion to have good ground.

Premises.—As much work as possible will be done in the department itself, where centralised facilities are available and the necessity for moving much apparatus is minimised. The main studio will be at least 40 ft. × 20 ft., with the ceiling not less than 15 ft. high. Three subsidiary studios, one for standardising portrait apparatus, one for standardising full-length views, will be 10 ft. × 15 ft., with ceilings 10 ft. high: and three small studios for small objects or pathological specimens will be 10 ft. × 8 ft.

Several dark-rooms and accessory rooms will be needed:

(1) The *chemical mixing room,* 6 ft. × 8 ft., will be fitted with two sinks, shelves, cupboards, and bins, next door to (2) the *chemical store-room* which opens onto an outside service yard; next door, but with no interconnecting door, is (3) the *sensitised material store-room,* built to comply with nitrate fire-risk regulations, and also opening onto the yard as well as into the department; (4) a *dry dark-room* for loading sensitised material into holders and cassettes; (5) the main *wet dark-room (negative),* equipped for developing all kinds of plates, films, and cine-films; (6) the main *wet dark-room (prints)* equipped with contact-printers and enlargers along one wall, and developing-dishes and sinks along the opposite wall; and (7) the *drying-room* containing drying-cupboards and racks for negatives and cine-film, and drying and glazing machines for prints, as well as print-trimmers. This will lead directly through to the secretary's office. Space must also be allocated to a copying-bench, a cine-titling bench, a cine-editing bench, and possibly micro-filming and photostat apparatus.

A secretary's office, filing-room, and directors' office will be needed. Dressing-cubicles for the patients, linen-cupboard, lavatories, and store-rooms for miscellaneous equipment will be needed, as well as a small surgery where the surface of lesions, if not already prepared in the ward, may be cleaned and redressed under proper conditions after photography.

Equipment.—A detailed inventory of equipment would be out of place here, for each department will find its own needs, but a minimal scale can be indicated for the chief items.

Studio Cameras.—A whole-plate studio-type with range of lenses and smaller-size plate adaptors; a quarter-plate studio-type with range of lenses; a quarter-plate reflex; and a Leica-type with range of lenses. A 16-mm. cine for general purposes.

Other cameras: copying camera; micro-filming and filmstrip camera; Leica-type for endoscopy; 16-mm. cine for micrography and endoscopy: and various cameras attached to the different standardising setups, and the cineradiographic camera.

Enlargers: whole-plate; quarter-plate; Leica-type.

Projectors: $4^1/_4$ in. × $4^1/_4$ in. slide; 50 mm. × 50 mm. slide: filmstrip; 16-mm. cine (silent); 16-mm. cine (sound); "movieola."

Lights: two 2-kW, four 1-kW, two 500-W variable spotlights ("moles"); two 2-kW floods; overhead batten in large studio; two condenser-discharge ("kodatrons"); miscellaneous photophloods.

Miscellaneous equipment: drying-cabinets, glazing-machines, and the like have already been mentioned. To these must be added a transmission-reflection densitometer, scales, and so on: and (in the studios) backcloths, tripods, a dolly, &c.

Specialised equipment: the department will design and build for itself gantries for photographing the bedridden, equipment for recording in the operating-theatres, and the like. The standardising equipment will be based on the X-ray diagnostic sinus-stand and over-table apparatus, supplemented by special additions.

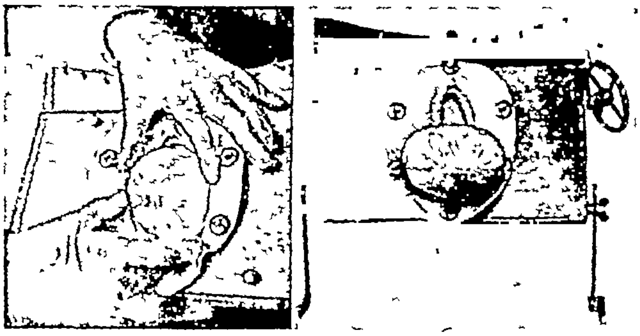
Such, in outline, are the likely requirements of a department equipped to meet all the demands likely to be made of it, and to progress with its independent schemes for advancement of technique. This scale of premises, staff, and equipment will not be required immediately the department opens, but it will need all this and probably more within three years of establishment.

ANATOMICAL MODELS IN TEACHING

RAOUL DE SEIGNEUX, M.D.
PROFESSOR OF OBSTETRICS, UNIVERSITY OF GENEVA

MODELS reproducing the appearance, consistence, and feel of body tissues can contribute much to medical teaching, not only by sparing patients unnecessary examinations but also by giving the student a wider experience than he would otherwise get. With this in mind, I developed some years ago a technique for making models from gelatin on a gauze base; the colouring is mixed with the material, which resists extremes of temperature. The models are supple but unbreakable.

Models made in this way have been used successfully in the teaching of obstetrics. A model of a full-term fœtus was made and a manikin devised to which interchangeable parts could be fixed. A series of models reproduce successive stages of labour with the os in various stages of dilatation. By means of a simple lever at the side of the manikin (fig. *b*), all the movements of the fœtal head in labour can be reproduced. The effects of alternating uterine contraction and relaxation are simulated; and delivery at the vulva can be practised (fig. *a*). The material takes stitches well, and models have been constructed to enable students to practise stitching of the various layers of the pelvic floor. A collection of interchangeable models has been built up to represent various gynæcological disorders: the position and the feel are the same as in the human subject, but the accuracy of the sensory impression and its interpretation can be checked by removing the part representing the abdominal wall. Some models have been arranged to give practice in the lesser gynæcological operations, such as dilatation of the cervix, curettage, replacement of a displaced uterus, and the fitting of a pessary.



(*a*) (*b*)

Models for use in obstetrical teaching: (*a*) delivery of the fœtal head; (*b*) external rotation of the head, showing wheel for controlling the movements of the fœtus.

By the same method the complete muscular system of an entire body, with nerves and blood-vessels, has been reproduced. The different layers of any region can be represented, layer by layer, on successive models. A model of head and thorax has been built for laryngoscopic examinations, and by squeezing a bulb the vocal cords can be made to vibrate as in life. Affections of the tongue, tonsils, pharynx, and upper respiratory tract can be accurately portrayed with interchangeable parts. Complete limbs have been reproduced for practice in setting fractures; a model of the lower urinary tract provides experience in catheterisation, and, again by the use of interchangeable parts, in the identification of pathological states of the bladder.

I have demonstrated my collection of models before various congresses of the Association of French-speaking Gynæcologists and Obstetricians—at Geneva in 1923, in Paris in 1925, at Lyons in 1927, and at Bordeaux in 1931, and have received a multitude of inquiries from universities as far distant as Helsinki, Sydney, Melbourne, Dunedin, and Manila, showing that the models satisfy a real need in medical teaching.

CHILDREN WHO SPEND TOO LONG IN BED

J. A. MCCLUSKIE
M.B., B.Sc. Glasg.
CHILD PSYCHIATRIST, SURREY AND SOUTHEND EDUCATION COMMITTEES

NOTHING could be farther from an accurate opinion of sleep and its control than the idea, prevalent among doctors as well as laymen, that so long as we have plenty of sleep we are all right. The doctor will advise extra sleep during an illness or in convalescence, but will not tell the parents to discontinue the extra sleep when the child is well. As a result, the parents often institute permanently the early-to-bed habit which, with its helpmate early-to-rise, is undoubtedly one of the golden rules of life. But they omit the early rising, so poor Johnny has to adapt himself to an extra hour in bed which he does not need. Months afterwards he appears before the psychiatrist because he is talking or restless in his sleep, and the story is that the illness caused it.

Directions for feeding in the most meticulous detail are known to mothers through a galaxy of pamphlets, books, leaflets, and dried-milk tins such as no civilisation has probably ever known. Sleep requires the same detailed directions, yet even medical textbooks almost ignore the subject.

Children of different ages react in different ways to being expected to sleep too long:

(1) *Infants* protest violently by crying vigorously if they are not lifted, and into this group fall most of those babies whose mothers maintain that it is better to let them cry. If a baby has an hour too much sleep during the day it will certainly cry during the night. But the crying will be put down to feeding aberrations, certainly by the parents and probably by the doctor too.

(2) *Toddlers* show restlessness, crying, and head-banging, and may develop other pastimes, such as thumb sucking, masturbation, and bed-wetting.

(3) *Children of school age* acquire such symptoms as talking in their sleep, sleep-walking, and bed-wetting.

RULES FOR SLEEP

Babies.—All mothers should know the hours of sleep required by their babies at each month. As the age increases the sleep should decrease, not according to whim but according to plan. In the crying baby, tests for oversleeping should receive as much weight as inquiry into deficiency in diet. This plan should be calculated as follows:

Age (months)	*Sleep required (hours)*	
Up to 1	.. 24	except for feeding
,, 2	.. 21	
,, 3	.. 20	
,, 4	.. 19	
,, 5	.. 12	+3 in morning and 3 in afternoon
,, 6	.. 12	
,, 7	.. 12	+2½ ,, ,, 2½ ,,
,, 8	.. 12	
,, 9	.. 12	+2 ,, ,, 2 ,,
,, 10	.. 12	+1½ ,, ,, 1½ ,,
,, 11	.. 12	+3
,, 12	.. 12	+2½

Every baby will require his own slight modification of this plan by, say, about 30 *minutes* according to his idiosyncrasy, but the lay-out should remain. For example, at five months it is necessary to calculate the sleep on a basis of 12 hours' continuous sleep during the night with the variations in the day sleep. Should the child of six months sleep for, say, 13 continuous night hours then the greatest care should be taken to deduct an hour from the 6 hours allowed for the day sleep. If the 12 hours' night sleep is held as the permanent s and the day sleep is varied, each child as he develops soon give his mother an indication of how much day p he requires. But this is certain: variation by even 30 minutes from the amount of sleep each particular d requires at each month produces violent change of aviour. The most placid infant deprived of an hour's p can become a veritable little screaming cat. Consely—and this is not so generally recognised—if a ld of eight months is given the sleep due to a child six months he certainly will have his parents walking midnight carpet. And how easy it is for a tired ther to allow her child to oversleep.

Toddlers.—Hours of sleep for toddlers should be culated as follows:

At 2 years old	..	12 hours	+1 hour in daytime
,, 3 ,, ,,	..	12 ,,	
,, 4 ,, ,,	..	11½ ,,	

Two years is a very difficult age for sleep regulation, cause the amount of sleep required is about 13 hours. e child often sleeps more than its nocturnal 12 hours, ich reduces the day sleep due to him to less than one ur. His mother, on the other hand, expects him to on sleeping during the day. Indeed one otherwise ite good little booklet advises that "the long morning ep" should go on until school age. If this is done, e child will certainly cut down his night sleep by aking during the night.

In toddlers who are getting too much sleep headnging is common. I read in a popular ladies' journal cently a request to the "Aunt Jane" column for lvice on this subject. Little Gwendoline was waking uring the night and "driving my husband almost antic"; it seemed to have been forgotten that the ddler was the one who was being driven frantic in the rst instance. The superficial reason in most of these sleep" deviations is in almost every instance the versleeping of the child. The parents do not know that definite scientific programme of gradual sleep modifiation is necessary, because they have never been given ne.

A serious situation is created by keeping very young hildren, say, aged 3 years, from getting up in the orning because they have awakened too early. A ealthy child of this age wakens with the dynamic force f an animal and the vocal exuberance of a bird. Many hildren are treated with the most appalling dictatorial yranny by their parents because of this; force and xuberance are sapped, and the child lies in his bed neek, cowed, and completely inhibited, earning from is forceful mother the name of now being a very good oy, but later he becomes the easy victim of the aggressive hild in the playground and of difficult rising in later ife.

In one doctor's house in which I lived for a short time a little boy, aged 3 years, lay from 6 A.M. until 8 A.M. in a wet bed playing with the blankets. His mother boasted that he was at one time very difficult on waking, but she had trained him to lie quietly.

School-children.—Hours of sleep for children of school age should be:

At 5, 6, 7 years old	.. .. ..	11 hours
,, 8, 9, 10 ,, ,,	.. .. ..	10½ ,,
,, 11, 12, 13 ,, ,,	.. .. ..	10 ,,

Many children do adapt themselves to over-protective parents by doing something, such as reading for an hour or so either before going to sleep or even on waking early in the morning. But many children cannot, or are not allowed to, adopt such a practice, and then the evil begins: masturbation or brooding is substituted for reading.

Another deviation is that the child falls asleep when he first goes to bed but later develops a light sleep during which he manifests the talking and restlessness already mentioned. In these cases there is almost always some other form of conflict, such as the association of an aggressive child with an aggressive parent, but the precipitating cause is the hour too long in bed. In other cases he cannot sleep when he goes to bed, and so later falls into a very deep sleep and possibly wets the bed or is tired in the morning.

Here are two examples:

CASE 1.—A boy, aged 14, about whom the assistant medical officer's report stated: "Referred by his headmaster for failure to concentrate and nail-biting. At home he is some days very amenable, and other days he is most aggravating. Very excitable and temperamental. Excessive finger-biting first started with air-raids in 1940. Failure to concentrate—takes a long time to go to sleep. Has taken money on two occasions some years ago but no trouble recently."

The notable feature of this report is the "dash" and small "t" for "takes" in the sentence "Failure to concentrate—takes a long time to go to sleep." No wonder he was unable to concentrate, because he was going to bed at 8 P.M. and getting up at 8 A.M.

CASE 2.—A girl, aged 6 years, was restless in school, talking in her sleep, and waking "too early" in the morning. She went to bed at 6.30 P.M. and got up at 7.45 A.M. on the instructions of her mother. At 2 years of age she used to be awake 2 hours during the night until her mother gave her a smack, and immediately she went to sleep.

The obvious psychiatric points are the expression "waking too early in the morning" and the fact that the mother's smack coincided with the end of the period of wakefulness.

On children of school age some parents are exerting alarming discipline. Boys of 9 and 10 years and even boys bursting with energy on the threshold of puberty are compelled to spend from 8 P.M. till 8 A.M. in bed while the parents boast of their carefulness in this matter. How it is going to be possible to educate the parents I cannot say.

Prof. Charlotte Bühler observes:

> "There is a fundamental law of development at work. . . . The development is especially clear in the diminishing needs of sleep for the child. In the course of the first year most parents who are at all concerned with the child pay special attention to its sleep. Later this interest is not so general." [1]

Her figures are not in my opinion consistent: the observation that children of 10 months slept for eleven hours while children of 12 months slept for thirteen hours calls for further research. My own figures for infants tending toward the maximum are actually higher than hers. The times she quotes as "minimum for children and adolescents" are supported by foreign authors and correspond to my own, but they are much too indefinite at ages 1 to 3 to be of practical use.

Boarding-schools and remand homes show uniformity in treatment of the 9–13 group, although remand-home boys seem to manage with less sleep than those in boarding-schools. Mothers should take a lesson from all these institutions. There are considerable variations among the schools in the younger age-groups, with a tendency to bed the youngest at what I consider too early an hour.

The very excessive bedding indulged in by parents is not found in schools, however; and, in any case, community life is not so likely to encourage egocentric or introspective living. For this reason, to allow for individual idiosyncrasies, boarding-schools should add about half an hour to the times recommended above.

I am indebted to the headmasters of Eton College, and St. Christopher's School, Letchworth, for helpful observations.

---

1. Bühler, C. From Birth to Maturity, London, 1935.

JOSEPH ROGERS PRIZE.—The president of the Royal College of Physicians and the master of the Society of Apothecaries of London have awarded this prize for 1946 to Dr. R. C. Wofinden, of Greasborough, Rotherham.

Reviews of Books

Illustrations of Regional Anatomy

(6th ed.) E. B. JAMIESON, M.D., senior demonstrator and lecturer emeritus, anatomy department, University of Edinburgh. Edinburgh: E. & S. Livingstone. Pp. 320. 75s.

THE wide and continuous demand for Dr. Jamieson's book of anatomical diagrams has led to a new edition. The pictures are mostly based on blackboard diagrams, originally built up, step by step, to explain the relations of the parts. The shapes of the parts are therefore shown with a sharpness of outline which may sometimes tantalise the student who finds the grey structures which he dissects very different from the purple or green ones here outlined. Learning from diagrams has the further danger that they may mislead by oversimplification. But no student who understands the functions of art would be so foolish as to suppose that these brilliant illustrations represent the reality which he will find in the body. And when he leaves the obscurities of the tissue which he finds in the dissecting-room he will be refreshed by the clarity of Dr. Jamieson's polychromatic analysis.

In the interest of Scotch exactness we must take exception to the legend of fig. 37. Surely the visual pathway in the brain should not be called "the path of conduction of light."

The Management of Obstetric Difficulties

(3rd ed.) PAUL TITUS, M.D., obstetrician and gynæcologist to the St. Margaret Memorial Hospital, Pittsburgh. London: H. Kimpton. Pp. 1000. 50s.

AN author generally believes, and always hopes, that each succeeding edition of his book is an improvement. In this respect Dr. Paul Titus can have no doubts, for, good as were the first two editions, the third surpasses them. The subject of sterility is now brought up to date and the chapter on X-ray pelvimetry has been rewritten. An account is given of the technique of caudal analgesia; the extraperitoneal method of cæsarean section is described; and the chapter on intravenous infusions has been completely revised, with consideration of Rh incompatibilities and erythroblastosis. Though the chapter on puerperal sepsis may still merit amplification, the work as a whole is well balanced. Each chapter may be regarded as a monograph on its subject and is followed by an adequate bibliography. Illustrations are well chosen, well drawn, and well reproduced, including eight coloured plates. The author's enthusiasm for his work is, unconsciously perhaps, imparted to the reader. The introduction contains a lengthy and critical review of the practice of obstetrics of today, which will be of value to those considering the problem in this country.

Manson's Tropical Diseases

(12th ed.) SIR PHILIP MANSON-BAHR, C.M.G., D.S.O., M.D. Camb., F.R.C.P., senior physician to the Hospital for Tropical Diseases, London, the Albert Dock Hospital, and the Tilbury Hospital; consulting physician to the Colonial Office. London: Cassell. Pp. 1068. 42s.

IN the 12th edition of this standard English work the section on the typhus group of fevers has been rewritten, and that on leprosy has been largely modified. Sundry figures in the text, particularly in the chapters on parasitology, have been redrawn, and the total number has been increased, while the number of plates has been slightly reduced. A chapter on the technique of injection and of blood-transfusion has been inserted. Another valuable addition is a table of the drugs employed in the treatment of tropical diseases, which indicates the structural formula of each compound, its dosage and method of administration, and the occasion for its use, with some comments on its therapeutic properties and value where these are in doubt. The material in the chapters on medical entomology has been redrafted and rearranged, with manifest improvement. All the additional information has been included without increasing the bulk of the volume, which has in fact fewer pages than its predecessor.

This edition is an up-to-date and comprehensive compendium, which well meets the present need for information on tropical diseases, whether encountered at home or overseas.

Mitchell-Nelson Textbook of Pediatrics

(4th ed.) Editor: WALDO E. NELSON, M.D., professor of pædiatrics, Temple University. London: W. B. Saunders. Pp. 1350. 50s.

THOUGH completely rewritten this work retains something of the tradition of the previous editions, through the close association of the present editor with the late Dr. Mitchell. It is an outstanding production: indeed we know of no single-volume pædiatric textbook which equals it in scope. The inclusion of a wide selection of key references is one of the features which made earlier editions so valuable to the pædiatrician. Professor Nelson has been faced with the inevitable difficulties of grouping diseases according to age-incidence, infective or other nature, and systems, but has steered his way with remarkable success. The book starts with a survey of pædiatrics, followed by a section on the care and evaluation of well children which is useful and well balanced except perhaps for the part on "mental and emotional development" which is relatively short and gives the impression of being superficial. Otherwise there is little to criticise and much to commend. Recent advances are dealt with faithfully but not at disproportionate length, and those who have been out of touch with pædiatrics during the war will, if they secure this volume for their shelves, be able to face with confidence a world resounding with words like rhesus factor and toxoplasmosis.

Government in Public Health

HARRY S. MUSTARD, B.S., M.D., LL.D., De Lamar professor of public health practice and director, School of Public Health, Columbia University, New York. London: Oxford University Press. Pp. 219. 8s. 6d.

IN 1942 the New York Academy of Medicine appointed a committee to study how to make available to the whole country the most efficient practice in preventive and curative medicine "at a lower per capita cost than the present system permits." The committee early felt the need of systematic data. The present volume, the second of twelve, describes the development of public health in the United States, and points out the directions in which further development is most needed. It is a valuable book, objective and critical. Professor Mustard shows not only where but why attempts at progress have met with success or failure. As he writes with tomorrow in view, he deals more with shortcomings than achievements, holding that future improvements "will not be attained by gloating over past accomplishments"; and instead of laying stress on the high standard of public health work that prevails over large areas in America he is more concerned to point out that "the local authorities of at least one-fourth of the population of the United States have so far failed to provide their citizens with anything approaching adequate health service." He concludes that what is most urgently necessary is to deal effectively with that situation. Written with a light touch, his book is not only informative and suggestive but remarkably entertaining.

Manual of Surgical Anatomy

(Pocket edition.) Prepared under the auspices of the committee on surgery of the Division of Medical Sciences of the National Research Council by TOM JONES, professor of medical and dental illustration and head of department of illustration studios, University of Illinois; W. C. SHEPARD, art editor, W. B. Saunders Company. London: W. B. Saunders. Pp. 254, 15s.; and pp. 195, 2

THIS manual has two almost equal parts. The first is an atlas including many drawings illustrating the anatomy of operative surgery. The second is an explanatory index. The drawings are excellent, but some have suffered by condensation in size for the pocket edition, and the book is somewhat marred by a number of anatomical and printer's errors. Also, though the terminology adopted in the atlas is predominantly that of the B.N.A., it is not consistently so. It seems rather curious that, when 7 pages are devoted to the surgery of the sympathetic, there is not a single illustration of the surgical approach to the spleen. Nevertheless the drawings of operative surgery are particularly well done, and though the manual cannot be recommended to students it should find a place in postgraduate surgery.

TREATMENT OF ANÆMIA

with

COLLIRON

(colloidal iron hydroxide)

Colliron provides iron in a palatable and assimilable form for the treatment of iron deficiency anæmias and for supplementing dietary intake, particularly in invalids, expectant and nursing mothers.

Colliron is colloidal iron hydroxide with copper, cobalt and manganese. Each drachm contains the equivalent of 6 gr. of metallic iron or 32 gr. Ferri et Ammonii Citras.

Issued in bottles of 4, 8, 40 and 80 fl. oz.

Colliron capsules containing iron, nicotinic acid
and aneurine hydrochloride are also available.
Issued in bottles containing 30 and 250 capsules.

For further particulars apply to—
Liverpool: Home Medical Department, Speke, Liverpool, 19
London: Home Medical Department, Bartholomew Close, E.C.1

MEDICAL EVANS PRODUCTS

Made in England by
EVANS MEDICAL SUPPLIES LTD

M52

BOOKS FOR THE STUDENT

NEW (SEVENTH) EDITION — THIRTIETH THOUSAND

With 1063 Illustrations (203 coloured) — Demy 8vo — 40s. net

A SHORT PRACTICE OF SURGERY

By **HAMILTON BAILEY,** F.R.C.S., Surgeon, Royal Northern Hospital, London and **R. J. McNEILL LOVE,** M.S., F.R.C.S. Surgeon, Royal Northern Hospital, London

KETTLE'S PATHOLOGY OF TUMOURS

By **E. H. KETTLE,** M.D., B.S. Revised and rewritten by W. G. BARNARD, F.R.C.P., and A. H. T. ROBB-SMITH, M.A., M.D. Third Edition. Fully Illustrated. Demy 8vo. **21s.** net; postage 9d.

CARDIOVASCULAR DISEASE IN GENERAL PRACTICE

By **TERENCE EAST,** M.A., D.M. Oxon., F.R.C.P. Lond. Second Edition. With 48 Illustrations. Demy 8vo. **12s. 6d.** net; postage 7d.

THE ACTION OF MUSCLES

Including Muscle Rest and Muscle Re-education

By **Sir COLIN MACKENZIE,** M.D., F.R.C.S., F.R.S.Edin. Second Edition. Biographical Note by C. V. MACKAY, M.D. Melb., with a portrait. With 100 Illustrations. Demy 8vo. **12s. 6d.** net; postage 7d.

COMMON SKIN DISEASES

By **A. C. ROXBURGH,** M.D., F.R.C.P. Seventh Edition. With 8 Coloured Plates and 184 Illustrations in the Text. Demy 8vo. **18s.** net; postage 7d.

A HANDBOOK OF RADIOGRAPHY

By **J. A. ROSS,** M.A. Camb., M.R.C.S. Eng., L.R.C.P. Lond., D.M.R.E. Liverp. Second Edition. With Illustrations. Demy 8vo. **10s. 6d.** net; postage 7d.

NOTABLE NAMES IN MEDICINE AND SURGERY

By **HAMILTON BAILEY,** F.R.C.S., and **W. J. BISHOP,** F.L.A. Second Edition. Profusely Illustrated. **15s.** net; postage 6d.

Just published — Third Edition — With Illustrations (some coloured) — Royal 8vo — 50s. net

PRACTICAL HANDBOOK OF THE PATHOLOGY OF THE SKIN

An Introduction to the Histology, Pathology, Bacteriology and Mycology of the Skin with Special Reference to Technique.

By **J. M. H. MACLEOD,** M.A., M.D., F.R.C.P. Lond., Physician and Hon. Director of the Pathological Department, St. John's Hospital, etc., and **I. MUENDE,** M.R.C.P. Lond., M.B., B.Sc. Lond., Pathologist with Outpatient Clinic and Lecturer in Pathology to St. John's Hospital; Dermatologist to the Middlesex County Council, Willesden General Hospital, etc.

REGIONAL ANALGESIA

By **H. W. L. MOLESWORTH,** F.R.C.S. Eng. Second Edition. With Illustrations. Demy 8vo. **8s. 6d.** net; postage 7d.

ANATOMY AND PHYSIOLOGY FOR NURSES

By **J. L. HAMILTON PATERSON,** M.D. Lond., M.B., B.S., M.R.C.P., M.R.C.S. Demy 8vo. **9s.** net; postage 7d.

A GUIDE TO HUMAN PARASITOLOGY

For Medical Practitioners

By **D. B. BLACKLOCK,** M.D. Edin., D.P.H. Lond., D.T.M. Liverp., and **T. SOUTHWELL,** D.Sc., Ph.D. Fourth Edition. With 2 Coloured Plates and 122 Text Illustrations. Royal 8vo. **15s.** net; postage 9d.

THE SULPHONAMIDES IN THEORY AND PRACTICE

By **J. STEWART LAWRENCE,** M.D. Edin., M.B., Ch.B., M.R.C.P. Demy 8vo. **9s.** net; postage 6d.

THE THEORY AND PRACTICE OF MASSAGE AND MEDICAL GYMNASTICS

By **BEATRICE M. GOODALL-COPESTAKE.** Sixth Edition, revised. With 129 Illustrations. Demy 8vo. **16s.** net; postage 7d.

THEORY AND PRACTICE OF NURSING

By **M. A. GULLAN,** formerly Sister Tutor of St. Thomas's, London. Fifth Edition. With Illustrations. Demy 8vo. **12s. 6d.** net; postage 7d.

A HANDBOOK OF SANITARY LAW

For the Use of Candidates for Public Health Qualifications

By **B. BURNETT HAM,** M.D., D.P.H. Camb. Twelfth Edition. F'cap 8vo. **7s. 6d.** net; postage 5d.

THE SYMPTOMATIC DIAGNOSIS AND TREATMENT OF GYNÆCOLOGICAL DISORDERS

By **M. MOORE WHITE,** M.D. Lond., M.B., B.S., F.R.C.S. Eng., M.R.C.O.G. Second Edition. With 107 Illustrations. **16s.** net; postage 6d.

MINOR SURGERY

By **R. J. McNEILL LOVE,** M.S., F.R.C.S. Second Edition. With numerous Illustrations. **15s.** net; postage 6d.

By the Same Author

A GUIDE TO THE SURGICAL PAPER

With Questions and Answers

Second Edition. F'cap 8vo. **6s.** net; postage 3d.

VARICOSE VEINS, HÆMORRHOIDS AND OTHER CONDITIONS

Their Treatment by Injection

By **R. ROWDEN FOOTE,** M.R.C.S., L.R.C.P., D.R.C.O.G. Demy 8vo. With 54 Illustrations. **12s. 6d.** net; postage 4d.

BIOLOGY STAINING SCHEDULES

For First-Year Students

By **R. R. FOWELL,** M.Sc. Second Edition. Paper Covers. **2s.** net; postage 2d.

WHAT TO DO IN CASES OF POISONING

By **W. MURRELL,** M.D. Fifteenth Edition. Revised by H. G. BROADBRIDGE, M.B., B.S., M.R.C.S., L.R.C.P. F'cap 8vo. **8s.** net; postage 4d.

SANITARY LAW IN QUESTION AND ANSWER

For the Use of Students of Public Health

By **C. PORTER,** M.D., B.Sc., M.O.H., and **JAMES FENTON,** M.D., D.P.H. Fourth Edition. Crown 8vo. **10s.** net; postage 7d.

Obtainable of all Booksellers

LONDON: H. K. LEWIS & Co. Ltd.
136 GOWER STREET, W.C.1

Telephone: EUSton 4282 — Telegrams: Publicavit, Westcent, London

THE LANCET

LONDON: SATURDAY, AUGUST 31, 1946

This Year, Next Year

In the past year we have been thinking much about the new National Health Service, but little about the medical schools which must provide the men and women to staff it. The tasks before these schools are vast. They must repair the losses of war: new buildings planned in 1939 are still unbuilt, and many of the old buildings, besides suffering the natural process of decay, have been damaged. And they lack teachers: men who would normally have been trained for teaching and research work in the ancillary sciences, such as biochemistry, physiology, pharmacology, and pathology, have instead become much-needed clinicians.

The schools themselves have long recognised that they should be taking more students, and planning their curriculum to fulfil modern demands. The Goodenough report emphasised this duty, and the National Health Service, bringing with it a growing demand for doctors, makes it urgent. Moreover, the schools must, at least for several years, try to meet the claims of an abnormally large number of candidates for medical training, many of them ex-Servicemen. The exact number of candidates is unknown, since often they apply simultaneously to two or more schools, but they certainly far exceed the schools' capacity. How long the heavy demand will be maintained is unknown; but some see it as a wave subsiding slowly over the next few years The coming academic year, following twelve months of mass demobilisation, will probably carry the peak; but the following year may almost equal it, because the demobilised, though fewer, will be younger, and therefore the readier to seek a university training. In 1948–49 the ranks may be swollen by the return from the Forces of the many schoolboys whose claims have been deferred this year to leave the way clear for ex-Servicemen.

INTAKE AND SELECTION

Wherever possible, the schools have responded to the present surge by increasing their intake; but though they regret the need to reject candidates who would normally be accepted, they have set their face against taking so many that the standard of teaching would fall. The difficulty of choosing the best students has brought into prominence the ways by which they are admitted. The common portal of entry, recommended in the Norwood report but not yet established, is a long-overdue reform. A boy trained at a northern grammar school for a specific examination sponsored and accepted for matriculation by a nearby university was recently refused admission elsewhere in the country because that examination is not recognised by other universities as qualifying for matriculation. The schools which insist on individual entrance examinations should acknowledge the burden that these place on candidates, and agree to a common entrance examination. In the year before leaving school young women, uncertain of acceptance at any one centre, sometimes sit no fewer than five separate entrance examinations, besides those for university scholarships and higher school certificates, from which they may hope to obtain State scholarships or county grants. No adolescent should be subjected to this unnecessary strain.

If intelligent primary selection by examination has not advanced in recent years, great strides have been made in other methods of selection. It is now generally recognised that a candidate who satisfies basic requirements in general education is not necessarily fit for a career in medicine, and, in fact, that medicine calls for qualities which cannot be assessed on the results of a competitive examination. It is therefore customary to interview candidates and to assess their personality, interests, and cultural background, with the help of a headmaster's report. At the London School of Medicine for Women, where 400–500 apply each year for 100 vacancies, the first 200 in the entrance examination are interviewed by a committee of five, sitting separately. A committee in full session has been found to overawe candidates, whereas the friendly personal interview is altogether less forbidding. After talking to ten or so applicants, the committee members meet and exchange opinions while these are still fresh in their minds; and the system has worked well Most schools set great store on this preliminary interview, which can help to eliminate those who seek to enter the profession purely for financial gain, and others who, not knowing what they want to do, are pressed by eager parents to adopt medicine as a career. We suggest that the time has come for the more conservative schools, which rely simply on school records, testimonials, and photographs, to employ more modern methods. Selection, however careful, is not infallible; but mistakes are made much more rarely than with no selection at all. If an examination is used for initial screening of candidates it should be designed to test general intelligence rather than factual knowledge.

It remains true that no test other than that of practice can finally prove whether or not the applicant has a bent for medicine. A boy or girl who has shown great aptitude for physics and chemistry may make a brilliant pure scientist but a poor doctor; indeed, many of those that eventually make good doctors find in these subjects an obstinate hurdle, largely because they are not shown how they apply to medicine itself. Occasionally a student after admission does not come up to expectations; and then, both to save his own time and in justice to another who would benefit by training, he is displaced as quickly as possible. At the London School of Medicine for Women, for example, the student who fails once in the first year's examination is asked to leave. Elsewhere, two chances are usually given, but careful watch is kept, sometimes through a progress committee which reviews doubtful cases every six months. The strain imposed by a single now-or-never chance must undoubtedly deprive the profession of some good doctors.

EX-SERVICEMAN OR SCHOOLBOY?

Most schools have welcomed the Ministry of Labour's ruling that up to 90% of places in the coming academic year should be reserved for ex-Servicemen.

The grants made to successful applicants under the Government's further-training scheme are probably generous enough to move a few unsuitable candidates to apply; but at all but one of eleven centres recently visited the general quality of men from the Forces was thought to be high. One dean holds that "the top and average are excellent, but the tail may be rather bigger than usual." The authorities have recognised the doggedness that prompts a man, five, six, or more years after leaving school, to return to academic training, beginning, more often than not, with the matriculation examination. This group has the tremendous advantage of mental maturity and judgment, so often lacking in the young students of the war years; their work may benefit, too, by the wish, not so acute in the younger, to qualify and become independent with the least possible delay. They deserve first consideration, in common fairness, but the claims of those they displace must not be overlooked.

This year the medical schools will be unable to take more than a few chosen schoolboys; the remainder will join one of the Forces, in which they may serve for two years before starting their medical training. Most educators complain that medical students are subjected to continuous and usually concentrated teaching, always under the duress of examinations, from early youth up to the twenties. There should, they reason, be a break between school and medical training, so that the decision to take up medicine, and the course of study itself, may be approached with adult judgment. Such a break, they argue, is needed more by the medical than by any other student, because in medical training he finds a course so concentrated as to offer him little chance of mixing with students in other faculties; and indeed by reason of numbers, community of interest, and lack of opportunity (for apart from Oxford and Cambridge few universities have an established college life) almost his sole companionship is with other medical students. Some teachers therefore welcome the break enforced by military service; they advise those submitted to it to seize this chance of broadening their outlook, and to further their general education with the help of the Service educational authorities. Military training is said by a few to foster mental idleness and disinclination for study, but the keenness of those already released contradicts this rumour.

However, the system has its grave drawbacks, prolonging the period of dependence and postponing the prospect of marriage beyond even the advanced age customary among doctors. Certainly a schoolboy may get a good insight into Service conditions; but if he is ever recalled to the Services, it will be not as a combatant soldier but as a doctor. It would therefore be a gain for the Forces if he did his period of service after qualifying, when he is able to acquire the special techniques of Service doctoring.

CUTTING THE COAT

Most medical schools, and certainly the smaller ones, want to expand moderately as the Goodenough Committee advised. At most centres (Edinburgh is a notable exception) greater numbers could easily be accepted in the clinical years. There are, however, serious local difficulties. One school at least is noticeably short of clinical teachers because these are still being claimed by the Forces; others, usually because they need new buildings, have too few patients in their principal hospital. This second obstacle could undoubtedly be surmounted by closer liaison with municipal hospitals—which some teaching bodies are reluctant to achieve, partly because former relations with these hospitals have not always been of the happiest, and partly because they are not conveniently near. But the war has shown that the arrangement, however tiresome, is workable. Nearly all schools are increasing the number of their teaching appointments; at Birmingham two junior chiefs are now being appointed in place of one, because a call for consultants at the periphery is expected.

The difficulties at most centres are more stringent in the premedical and preclinical years. Unlike the schoolboy entrants, few ex-Servicemen have passed the first M.B. examination; thus there is now a bottle-neck in the first-year departments. When faculties of science are responsible for instruction in the first-year subjects—physics, biology, and chemistry—the medical student may sometimes receive less than his due. Not unnaturally teachers in these faculties are apt to think first of training pure scientists from whose ranks their own future teachers and research-workers will be drawn; and they can hardly be blamed for doing so when the country is as short of pure scientists as of doctors. The Barlow Committee estimated that Britain in 1955 will be 26,000 short of the required total number of scientists, even if universities train men to their full capacity in the intervening years. These faculties also train dental and veterinary students, besides those who instruct school-teachers, and those learning domestic science, nursing, and physiotherapy; and each of these groups is short of personnel. Some think that medical schools might give up teaching these preliminary subjects and accept students only from the beginning of the second year. Each year a small proportion fail in the July examinations, and thus a small but unpredictable number are unable to take the places allotted to them at the start of the second year. If a common school for premedical teaching were shared by two or three medical schools, no second-year vacancies need be wasted. But this would favour mass-teaching, against which modern opinion has set its face; it would deprive the first-year student of medical-school life, from which he is believed to benefit even at the start of his training; and it might delay that revision of first-year work and its closer association with clinical medicine which is the ambition of most teachers.

BUILDINGS AND STAFF

Numbers are further restricted by lack of laboratories and of teachers in the technical subjects. Before the war, many schools had plans for expanding these departments, which even then were too small for teaching or research or both. None of these plans have been carried out; and now the demand for teaching has grown and may be expected to grow still further. Charing Cross Hospital seeks to relieve the burden on King's College by building a new temporary department for the teaching of anatomy and physiology, to start work in October, 1947. Other schools have no such immediate prospect. At a few, the sole obstacle to the acceptance of more students is the lack of laboratory space. These are making the utmost use of existing buildings by lding classes in duplicate and triplicate; but this an inconvenient arrangement, with limited possilities, and, unless teaching staff and research space n be correspondingly multiplied, may even lead to generation of teachers into hacks. It is a disturbg thought that, despite the growing need for octors, suitable students are being turned away mply for lack of a building. A comparatively nall amount of work on repairs and construction ould make a very big difference, and we trust at the Government will favourably consider e proposal that two or more firms of building ontractors should at once be allocated to the niversities in order that it shall be done. With ach aid, if priorities were rightly chosen, notable xpansion would be possible within a couple of years; hereas if the claims of domestic building are rigidly nd exclusively enforced the development of essenial teaching institutions will be indefinitely, and angerously, postponed.

Buildings, however, are only a means to an end, nd usually the problem of space is complementary the far more difficult problem of staff; for existing affs are too small to make full use of new and rger buildings, while larger staffs could not be ontained in those now in use. Moreover, though ew departments could be completed in a year r less, useful additions to the teaching and esearch staff could not be trained in less than our or five years.

The medical schools want, above all, to avoid rogressing in a series of jerks; but that is exactly hat they may be compelled to do by their ignorance f when and to what extent their demands are to be net. The best they can now do is to train staff, while waiting for new buildings to be constructed t some unknown date in the future. Throughout he war those who would normally have taken such raining helped to meet the call for clinicians, and here is today such a shortage of trained biochemists, hysiologists, anatomists, pathologists, pharmacoogists, and bacteriologists as may not be made good or a generation to come. Not only must these men be rained, but the country's impaired prestige in research nust be restored. It is a giant task, but fortunately he right kind of men are volunteering in increasing umbers. The rising trend of university salaries has ttracted some, and the anticipated "flattening" of remuneration in the new health service has moved others to select an interesting career in teaching nd research. Some universities—notably Birmingam, where money has been set aside for training nen in the ancillary sciences and where a research nstitute is contemplated—are doing their utmost o overcome the deficit. In the final count, a man's eadiness to join the staff of a department is decided argely by the reputation of its head and by its esearch programme. Of late years some men with he keenest minds have been inclined to give up eaching and concentrate solely on research; this hould be checked, for students benefit greatly by ssociation with those who are at the growing-point of their subjects. Instruction by those that teach rithout at the same time engaging in research legenerates all too often into coaching. Thus whenver new and larger laboratories are built for students, uitable research accommodation must be constructed for those who will teach. If classes are too large there is always a danger of mechanical and impersonal teaching; and when numbers go up without a corresponding increase in staff, teachers are robbed of so much time for research, which may cause some of the best to withdraw completely from teaching.

NEW SCHOOL FOR WOMEN?

If competition for medical training is now keen among men, it is, and has long been, keener among women. Even the gain, in 1947, of 15% of vacancies in the London men's schools will bring little relief, since the London School of Medicine for Women is to take 15% of men. Those responsible for the training of women students do not, on the whole, favour the enforcement of this 15% quota on schools which are reluctant to accept the agreement. They think that either a few schools should accept men and women on a fifty-fifty basis, thus becoming truly coeducational, or that an entirely new school should be established. They contend, too, that places should be awarded by open competition, regardless of sex. One of the schools which has accepted women students in the last few years only has found them intellectually and personally acceptable and would willingly take more; some of the others demur at the prospect of accepting women, reiterating traditional arguments which in practice have little substance. The common complaint that the training of women is a waste of time since they often marry or otherwise retire is not substantiated by a recent survey which suggested that the proportion of those qualifying who are totally lost to medicine through marriage and all other causes—including retirement at 60—may be under 15%.

The survey was undertaken by the Medical Women's Federation in 1944. A questionary was sent to the women graduates of 21 British medical schools, and 4369 replies were received. Of these women, 3179 (73%) were in full-time and 574 (13%) in part-time work. They included 660 women under 30, of whom 83% were in full-time and 7% in part-time practice. Of 2865 women in the main working years of a doctor's life—between, that is, the ages of 30 and 59—75% were in full-time and 14% in part-time practice; so the proportion lost to medicine between these ages was only 11%. After 60, of course, there was a steep rise, 48% going out of practice.

Women clearly deserve a large share in any further increase in student accommodation. Despite the Goodenough Committee's recommendations, we suggest that the West London Hospital, which has done much for the instruction of women students in the war, should not lightly be abandoned as an undergraduate teaching centre. The successes of its students in examinations, and the growing inclination of entrants to place it at the head of their application list suggest that it should be developed rather than suppressed. Many competent observers believe that this nucleus could well be used as a basis for a new school, especially since there is little immediate prospect of having one elsewhere in the country.

Outside London the foundation of another school must wait upon the granting of a charter to a new university. Even then, ten or possibly twenty years would be needed to build up its staff and organisation. When the time comes, two parts of the country may be considered: the south-west and the East Midlands. The south-west is now served by Bristol, with a domain from Gloucester to Land's End—a stretch as long as the distance from London to Blackpool. Of the possible sites Plymouth is well placed for clinical teaching, but Exeter already has a college which has shown drive and initiative. For the East Midlands, Nottingham has a well-established college and suitable buildings, but Leicester can advance at least equal claims to recognition as a clinical school.

A COMMON PURPOSE

These prospects lie in the future. Can nothing be done to make a better job of the present? Some of the medical schools give a strong impression of fighting in the dark. They do not know the number of students they will be asked to accept in 1947–48, nor the method of allocation; they have not been told when their urgent building programme can begin; and they have no way of judging the effect of the new national service on the demand for graduates. Each school has vigorously set about righting the damage of war, inspired by the thought that the Goodenough recommendations may be acted on some day. But their efforts, though energetic, are local and only casually integrated. Surely a central body—perhaps a standing committee made up of the deans of all schools—could plan for the country at large, and declare the needs of the schools in a strong voice? This body might well keep a register of all candidates for entrance to medical schools, and set a common entrance examination for the schools which insist on this preliminary. There is no reason why it should have any other executive authority: the schools need not fear to lose their autonomy if such a body is formed—they would, as now, be subject only to the requirements of the General Medical Council. Any attempt to set up a common schedule of teaching for the whole country would of course be disastrous, and the suggested body would be well placed to ward off any such attempt. Its other functions would be to decide, by discussion among its members, which schools had prior claims to new buildings; to use every means to put the Goodenough recommendations into effect; and to act as a clearing-house for teachers, so that those schools which needed additional staff most urgently might have a reasonable chance of getting them. If more graduates were needed, the council of deans could decide at which schools the numbers should be increased, and to what extent. In much of its work the council would be supplemented by the medical-education committee of the University Grants Committee, which might, through the council's activities, be prompted to give a more decided lead.

To be lively and stimulating, medical teaching must always be conducted according to local inspiration and taste. But the training of doctors is a national undertaking. The schools should see themselves as a team, serving the whole country not in a narrow spirit of rivalry but as component colleges in a national university.

Air Marshal Sir Harold Whittingham, F.R.C.P., has been appointed medical adviser to the British Red Cross Society.

The Teaching of Anatomy

It has long been customary for teachers to admit that their students have too much to learn; yet the load grows automatically, year by year, with each advance of medical science. The sympathetic teacher in fact usually favours ruthless pruning of everything except his own subject; and this he successfully resists. On the preclinical subjects the Goodenough Committee held that there is "an urgent need in every school for a new viewpoint" and for the drastic elimination from the curriculum of a mass of detailed information "which serves only to clutter up the student's mind and deaden his interest in subjects that can and should make the liveliest appeal to him." And indeed it is very widely agreed that the anatomical burden, especially, is too heavy. The General Medical Council have not yet published their plans for overhauling the students timetable, but while we wait for these we might try to fit the anatomical curriculum for its proper task of training general practitioners.

Let us then begin by reducing the enormous volume of factual memorisation which topographical anatomy inflicts on students not destined to become surgeons. And here a notable step has now been taken by Prof. W. E. LE GROS CLARK, F.R.S., whose *Practical Anatomy Revised and Rewritten* is to appear next month.[1] His preface shows a welcome change in the oppressive anatomical wind which has hitherto prevailed.

> "The fact is," he says, "that current anatomical textbooks have developed and expanded by a process of gradual accretion from the days when the subject was still in its early descriptive stage, when the interest of the anatomist was mainly focused on rather abstract problems of morphology, and when (before the modern organisation of medical services, had been developed) almost any general practitioner might be called on to attempt major operations of an emergency type demanding a fairly intimate knowledge of topographical anatomy."

Probably less than 5% of medical students, he remarks, will ever undertake major surgery.

> "It thus appears unnecessary that the remaining 95% should still be required to study and memorise factual data whose importance lies solely in their application to specialised operative technique. The few who later decide to take up surgery as a career should be required, after qualification, to complete a further course of dissection, including all those details of topography which are or may be of direct importance for the surgeon."

He thinks the student's knowledge of topographical anatomy should be sufficient for the following purposes:

> "*To provide a basis for an intellectual appreciation* of the morphological principles which determine and influence the organisation of the living body (principles which the premedical course of biology should already have instilled to some extent); "to interpret in terms of structural organisation the normal physiology of the human body (and therefore to anticipate the probable results of interference with normal structure and structural relationships); to recognise the anatomical basis of the clinical signs and symptoms of disorder due to injury or disease; to understand the anatomical factors involved in the development of pathological processes and the possible complications which may arise therefrom; and to employ competently the ordinary methods of examination and treatment (including minor surgery) which involve anatomical knowledge."

---

1. To be published by Edward Arnold & Co., London, on Sept. 12th. Pp. 470. 25s.

He wants the decks cleared, partly to provide more room for

> "the study of morphogenetic principles either in embryological development or in the post-natal growth and repair of tissues, a thorough grounding in radiological and surface anatomy, a more systematic study of muscle actions and joint movements, a fuller consideration of the anatomy of the nervous system and the special senses (with special reference to their functional disorders), and an introduction to the principles and methods of experimental anatomy."

Most clinical teachers will find these views full of common sense; but do they go far enough? Is a "fuller consideration of the anatomy of the nervous system" justified? The practitioner who knows how little of the anatomy of the nervous system he remembers from second M.B. days may well feel that he should have been taught the broad principles of nervous-system anatomy, on which he now depends, rather than a mass of indigestible detail about the caudate nucleus and the bundle of Vicq d'Azyr which bewildered him and obscured the pertinent facts. The neurologist, the ophthalmologist, and the otologist should, like the surgeon, defer the acquisition of special knowledge until they are qualified. Again, does the future general practitioner need to study more systematically the movements of joints and muscles when the orthopædic surgeon or neurologist can advise on cases of difficulty? Surely time saved on topographical detail should be devoted to subjects of great vocational use (such as surface and radiological anatomy) or pre-eminent in educational value (such as the principles and methods of experimental anatomy). The change needed is reorientation of the anatomical course with emphasis on function rather than structure. The preclinical student needs to be fitted by his anatomical knowledge to appreciate more readily and intelligently what is to follow in the clinical years.

Some bold spirits have suggested that the education of the future general practitioner and specialist should diverge at a very early stage and that different courses of anatomy should be provided; but no student in the early stages of training can be sure where his abilities lie; moreover, in these days at least, a decision to marry may oblige him, as soon as he is qualified, to exchange the dream of the consulting-room for the reality of the surgery. Some think it a waste of time for every student to dissect the entire body; but actual dissection gives a familiarity and contact with the structures of the body which cannot be gained from specimens and models There is much to be said, however, for allowing students to attend a few preliminary classes at which an expert rapidly dissects and demonstrates the whole body. The beginner will then start work with a mind oriented to think in systems rather than structures.

Professor LE GROS CLARK's book, with some 450 pages, still seems to us to be on the large side; or rather it combines in one book what we should like to see as two. Not long ago we advocated[2] a revival of the small inexpensive dissecting manual, which can be used for practical work and thrown away when soiled. Students can use such a work concurrently with a textbook designed to give them a coherent knowledge of the systems. Complete accounts of the bodily structures, for the use of teachers, students of surgery, and research-workers, should be reserved for reference works. In covering dissection as well as the fundamentals of anatomy, Prof. LE GROS CLARK has been obliged to approach his subject by regions instead of by systems. Though he seems to us to give much more detail than the general practitioner may reasonably be expected to need, he fears that his fellow anatomists may think he has omitted many essentials. Some light might be thrown on this point by setting a test paper on anatomy to a group of general practitioners of 10–15 years' standing: what they know would surely be a useful index of what they need to know. But whether his book is too long or too short, or of exactly the right length, Professor LE GROS CLARK can be sure that most teachers, and all students, will welcome his positive effort to reform the teaching of anatomy.

Annotations

MORAL AND INTELLECTUAL LEADERSHIP

THE British Institute of Philosophy was founded 21 years ago to serve as a link between philosophy and the everyday world. At its coming-of-age meeting last month it listened to a symposium of papers by a philosopher, a scientist, a divine, and a classicist, on the Need for Moral and Intellectual Leadership. Through all that was said ran an urgent sense of apprehension for the future of our civilisation, now threatened with destruction because science has put in our hands tools of immense power and reach, which we yet lack the wisdom to use in our own best interests. The theme is of importance—not merely of theoretical interest but of plain practical importance—for every educated man, and not least for the doctor.

Viscount Samuel, speaking for and to the philosophers, urged that in this crisis their duty does not end with the serene detached contemplation of human life and human thought; they must emerge from their academic seclusion and say something that will affect human action. That a philosophy can be a motive force, Nietsche is evidence enough; Hitler chose his works as a present for Mussolini. That recent years have heard no clear expression of a beneficent philosophy may be due to the discordant voice and laboured utterance of present-day philosophers, and their greater concern with the limits of human knowledge than with the needs of human welfare. But it is possible, and desirable, that "philosophy, in this country and other countries, condescending to be comprehensible, inspired by a Socratic sense of mission, linking hands with religion, science, and scholarship, may yet renew her great days, teaching the teachers of the peoples and leading the leaders."

Prof. A. V. Hill, F.R.S., described human society today—in scientific phrase, and mild enough at that—as being in a highly reactive state. But reactions in human society, unlike those in chemical mixtures, depend on the initial activity of a few of the members, not on a general bulk initiative. These few are the leaders. Good leaders will use their reason and acknowledge moral principles. The majority of mankind "will respond to leadership, but the leadership, if it is to be effective, must appeal for the most part to feeling rather than to reason. The problem, therefore, is to find leaders who, basing their policy on reason and morality, are capable nevertheless of appealing enough to the feelings of their fellow citizens to cause them to follow." Science, so far as it can do so without compromising its prime loyalty to truth, should make some contribution to that leadership.

Canon Leonard Hodgson, professor of divinity in Oxford, trying to define a creed or philosophy of life, quoted Shaw: "what a man believes may be ascertained . . . from the assumptions on which he habitually acts," whether those assumptions are expressed or implied. A satisfactory creed must be rationally coherent, and it must empirically fit the facts of life and experience. The Christian theologist's contribution to the discussion on leadership is his claim that the events described in the Bible story are of central significance to the proper understanding of human life, and to the development of a satisfactory creed. But Canon Hodgson rightly adds that this claim must be continually subjected to the criticism of philosophy and of experience.

---

[2] *Lancet*, 1944, i, 569.

Prof. E. R. Dodds, regius professor of Greek in Oxford, was concerned with the responsibility of the universities in training leaders. He condemned the nineteenth-century conception of a university as "a holy citadel of pure scholarship" because it was incomplete. He urged that the universities should today make a deliberate contribution to the needs of a planned democratic society. Their problem is to provide society with the men it needs, and at the same time retain their freedom to pursue truth for its own sake. Their difficulty is that society demands mostly technicians and specialists, whereas society needs leaders with general wisdom, vision, and perspective. Their answer must be a continued effort to train students to think and to judge for themselves, on a broad basis of knowledge and experience, and with absolute intellectual honesty.

These stirrings are not merely pious panic induced by the atom bomb. They are the response of honest men whose social conscience has been moved, who are aware of the process of social integration that is the path of British democratic development, and who feel it their duty to take an active part in it. Most doctors owe some thought to these questions too. For medicine is—naturally and inevitably—caught up in the integration process. Doctors are now confronted with duties to society as well as with duties to the individual patient, and must face and deal with both. The peculiar intimacy of their relations with their fellow men gives them an influence on the behaviour and the mental attitudes of the community more powerful than they realise. The success with which the profession solves its major problem of preserving freedom and initiative within a nationally organised medical service will influence a whole series of similar questions of administrative structure in other spheres of activity. The medical schools, on the one hand more than ever built in to the universities, on the other in close contact with the social and individual problems of health and disease, are well placed to design the bridge between university studies and the human affairs of today, between honest thought and unselfish action. Medicine is in a position to show the world, by example rather than precept, that good leaders cannot be made to order, but that a free and stimulating intellectual climate will favour their development and that recognition and responsibility are their due when they appear. In sum, medicine is no longer an isolated affair between doctor and patient: the relations of both to the community are claiming an increasing amount of attention. In a more closely knit society medicine faces new difficulties, new responsibilities, and a more complicated task. The problem of leadership closely concerns it.

MODELLING IN MEDICINE

MOST of us can recall times, particularly during our dissecting days, when a model of an obscure anatomical recess served to enlighten our perplexity. Models may also be used for demonstrating pathological lesions and for illustrating surgical techniques and approaches. Bulbulian[1] discusses the ways of making them of plaster-of-paris, papier-mâché, wax, plastics, metal, or glass.

Direct freehand modelling, which involves the difficult and tedious procedure of copying, is necessary only for large-scale reproductions of intimate structure, such as cells or parasites. This method, which was used by the Greeks and Egyptians in antiquity for the portrayal of deformities, has now been replaced for general purposes by simpler techniques. A direct cast from the actual specimen is the easiest and best method, the medium being applied over the object to produce a negative cast from which the final positive cast is moulded. With hollow structures like the bronchial tree or cerebral ventricles no intermediate stage is needed, for a direct negative cast can be made by filling the lumen with the casting material. Though the casting method is quick and accurate, care is needed to procure a smooth impression and to impart the correct colouring. Direct casting is sometimes impracticable, as with the irregular surfaces and crevices of surgical exposures and post-mortem dissections. Here an indirect method is used, by making a freehand model in clay or other plastic, which is then reproduced by casting. With this process essentials can be judiciously emphasised and non-essentials eliminated; and it is particularly suitable for such intricate structures as the ear, eye, or embryo in magnification. But it is very lengthy, and the colouring is quite inaccurate unless it is incorporated in the medium from the start.

Finally, various composite models have been designed to illustrate particular techniques; thus for training students in endoscopy a plaster cast of head and trunk can be combined with a modelled lesion at the end of a dummy gastroscope. On another page, Professor de Seigneux describes the use of models made from gelatin on a gauze basis to give the student experience of the appearance of tissues and their consistence to palpation. Though useful in imparting basic principles, especially in obstetrics, models can never replace practice on living tissues; passing a catheter on a dummy urethra or setting a fracture in a limb which does not swell after injury is not the best of preparations for undertaking these operations on patients. It is a pity that the modern increase in the student-patient ratio makes such substitutes necessary.

PHYSIOLOGY OF THE NEWBORN INFANT

THERE may now be little need to emphasise the principle that consideration of disease should be preceded by study of the normal. There are still, however, many gaps in our physiological knowledge, one of the largest being the effect of age on body processes. Physiology, as generally taught, is based on observation of fully grown animals and men. Differences between species are largely neglected; students sometimes feel that frogs are not quite the same as men, but the view of their elders and betters seems to be that physiology is essentially the same throughout the vertebrate kingdom. The effect of age on a normal process is seldom demonstrated; and because few physiologists have interested themselves in the significance of age, progress has been retarded. Pædiatricians, for example, have been hampered in investigations and treatment by not knowing where the normal ended and the abnormal began; they have often been forced to work out the normal and its variations for themselves, and physiology owes these men a debt. Their findings, however, are scattered through the literature, and the time has come for a book on the physiology of infancy, bringing together all this knowledge.

Clement Smith[1] has now compiled just such a book, which will be welcomed by everyone interested in the subject. It is not very long—the second edition will probably be longer—but it is packed with facts, mostly considered and presented, with an invaluable biblio- hy at the end of each chapter. One of the work's t pleasing features is the international character of references ; too often nowadays these tend to have omewhat parochial flavour. The author rightly siders that study of the physiology of infancy must in with the fœtus, but he preserves a nice balance. pters are devoted to respiration, the blood, icterus natorum, energy metabolism and heat regulation, digestive tract, nutrition, mineral metabolism, renal siology, endocrines, and immunity, and each ends h a summary of its bearing on clinical medicine. lden behind the back cover there is perhaps the most ful feature of the whole volume—a table of normal ues.

---

[1] Bulbulian, A. H. *Proc. Mayo Clin.* 1945, 20, 383.

[1] Physiology of the Newborn Infant. Clement A. Smith, M.D., professor of pædiatrics, Wayne University; medical director, the Children's Hospital, Michigan. Springfield, Illinois: Char C. Thomas. Pp. 312. $5.50.

he material of this book is of great importance to dicine. It underlines the fact that our knowledge of subject has only just begun to develop. Here there uld be no national barriers, no call or excuse for ret research ; and if the spirit of international coöpera- n returns, great advances may be made in the next nty years.

CLINICAL PHOTOGRAPHY

CHEMICAL pathology now enables us to define with most mathematical precision minute changes in many dily functions ; and the clinician is increasingly alive the need for exact records of the changes he observes his daily work. This has prompted several hospitals plan photographic departments, and the Westminster ospital medical school has taken the lead by appointing doctor wholly employed on this work. But interest in linical photography is not confined to hospitals : among e societies the Scientific Film Association and the Royal hotographic Society both have medical groups ; and e Royal Society of Medicine early this year devoted n entire meeting to the uses of photography in diseases f the skin.

The practice of relegating the hospital photographic epartment to a basement room, under the care of a oorly paid technician, no longer suffices. On other ages Dr. Peter Hansell and Dr. Brian Stanford suggest equirements for the promotion of this neglected supple- ent to the clinician's vision. There may be delay before heir recommendations are fully met, if only through ck of trained staff. It is hoped that the schedule for he training of hospital photographers now being pre- ared by the Institute of British Photographers will be ollowed by the adoption of a course and examination which will give trained medical photographers a status imilar to that of trained radiographers ; with the emobilisation of the many who have had special experi- nce of photography in the Forces, there should be no ack of suitable candidates. The recruitment of doctors o supervise the departments may be less easy ; probably ew will at first be willing completely to abandon clinical nedicine and to combine their hobby with their profes- ional training in the work of the photographic epartment. But medicine will be greatly benefited by hose who take the plunge.

GROUP PRACTICE IN AMERICA

DURING the last thirty years medical group practice has extended in the United States, especially in the West and Mid-west. There are, broadly, three kinds of groups, organised to meet varying needs : (1) " reference groups," such as the Mayo Clinic, where there is a staff of over 600 doctors, provide diagnosis and treatment, primarily over a short period, for patients with unusual or complicated conditions ; (2) " diagnostic groups " do no more than make a diagnosis and furnish a report to the doctor referring the case ; while (3) " service groups," now numbering about 500, offer family medical care and the commoner specialist facilities. The groups have formed a central organisation, the Medical Group Practice Council,[1] which held its fourth annual meeting at Princeton, N.J., last May, when it was announced that next autumn the New York University College of Medicine will establish the first medical group-practice unit to be undertaken by a medical school. An account was given of a group-practice unit that looked after the 75,000 workers on the atom-bomb project at Oak Ridge. Within a year the Federal government built in the wilderness the atom-bomb factories and the town of Oak Ridge, together with a 325-bed hospital and the necessary clinics. Before the town was built there was not a doctor within twenty miles of the place. A voluntary health-insurance organisation, the Oak Ridge Health Association, was formed on a prepayment basis and financed by contributions from the employed persons with a government subsidy ; and a complete service of medical care was provided by 50 army doctors working from the hospital. On the average, 600 patients were treated daily at the clinics, the maximum number being about 750. The unexpectedly rapid demobilisation of medical officers after the end of the war led to the discontinuance of group practice at Oak Ridge, where, it was stated, there are now 23 private doctors practising for fees.

Prominent among the questions discussed at the Princeton meeting was how to make known the advantages of group practice to the American medical profession, and particularly to the younger doctors. The Medical Group Practice Council proposes to prepare a manual explaining in detail what experience has shown to be the elements essential for success. The council has, however, already published an interesting pamphlet, *Solo or Symphony*, for the guidance of demobilised doctors contemplating entrance into medical group practice. Its 44 pages contain a remarkable fund of practical information, and it concludes by laying stress on the importance of planning the staff of a medical group to suit the varying local conditions : " You must carefully tailor its size and specialist representation," it is said, " to fit the size and requirements of the community you plan to serve."

ELEVEN PLUS

OUR leading article speaks of progress in the technique of selecting candidates for a career in medicine. Unhappily, despite the Education Act of 1944, there has been no similar advance in the choice of boys and girls for higher education, and some of those who might benefit most by medical and other university training never reach the stage of presenting themselves for admission. The child of the less well-to-do, now as before, gets his last chance of a grammar school, and thence a university education, when he is just past the eleven-year-old mark. Examinations, as is acknowledged in modern methods of choosing medical students, are apt to give a distorted reflection of capacity ; and the objections to relying on them are doubly cogent at the early age of 11. A child may be a "late developer" ; he may, through illness, have missed six months' schooling ; he may, as often happens in the early years, have brilliance but little application ; he may have been unwisely taught ; or he may, again, show himself in a poor light when submitted to the routine of the formal examination. If he is a victim of any of these circumstances, he may fail, and by this single failure the doors to a university education are as good as barred to him before he enters his teens. Under the new Act authorities are empowered to transfer children to grammar schools at a later age, but it remains to be seen how far they will do it.

Children whose parents can bear the cost of continued post-primary education are not exposed to this hazard ;

---

[1] Address: Medical Administration Service, Inc., 1790, Broadway, New York 19, N.Y., U.S.A.

quoted Shaw: "what a man believes may be ascertained . . . from the assumptions on which he habitually acts," whether those assumptions are expressed or implied. A satisfactory creed must be rationally coherent, and it must empirically fit the facts of life and experience. The Christian theologist's contribution to the discussion on leadership is his claim that the events described in the Bible story are of central significance to the proper understanding of human life, and to the development of a satisfactory creed. But Canon Hodgson rightly adds that this claim must be continually subjected to the criticism of philosophy and of experience.

Prof. E. R. Dodds, regius professor of Greek in Oxford, was concerned with the responsibility of the universities in training leaders. He condemned the nineteenth-century conception of a university as "a holy citadel of pure scholarship" because it was incomplete. He urged that the universities should today make a deliberate contribution to the needs of a planned democratic society. Their problem is to provide society with the men it needs, and at the same time retain their freedom to pursue truth for its own sake. Their difficulty is that society *demands mostly technicians and specialists, whereas* society needs leaders with general wisdom, vision, and perspective. Their answer must be a continued effort to train students to think and to judge for themselves, on a broad basis of knowledge and experience, and with absolute intellectual honesty.

These stirrings are not merely pious panic induced by the atom bomb. They are the response of honest men whose social conscience has been moved, who are aware of the process of social integration that is the path of British democratic development, and who feel it their duty to take an active part in it. Most doctors owe some thought to these questions too. For medicine is—naturally and inevitably—*caught up in the integration* process. Doctors are now confronted with duties to society as well as with duties to the individual patient, and must face and deal with both. The peculiar intimacy of their relations with their fellow men gives them an influence on the behaviour and the mental attitudes of the community more powerful than they realise. The success with which the profession solves its major problem of preserving freedom and initiative within a nationally organised medical service will influence a whole series of similar questions of administrative structure in other spheres of activity. The medical schools, on the one hand more than ever built in to the universities, on the other in close contact with the social and individual problems of health and disease, are well placed to design the bridge between university studies and the human affairs of today, between honest thought and unselfish action. Medicine is in a position to show the world, by example rather than precept, that good leaders cannot be made to order, but that a free and stimulating intellectual climate will favour their development and that recognition and responsibility are their due when they appear. In sum, medicine is no longer an isolated affair between doctor and patient: the relations of both to the community are claiming an increasing amount of attention. In a more closely knit society medicine faces new difficulties, new responsibilities, and a more complicated task. The problem of leadership closely concerns it.

MODELLING IN MEDICINE

MOST of us can recall times, particularly during our dissecting days, when a model of an obscure anatomical recess served to enlighten our perplexity. Models may also be used for demonstrating pathological lesions and for illustrating surgical techniques and approaches. Bulbulian[1] discusses the ways of making them of plaster-of-paris, papier-mâché, wax, plastics, metal, or glass.

Direct freehand modelling, which involves the difficult and tedious procedure of copying, is necessary only for large-scale reproductions of intimate structure, such as cells or parasites. This method, which was used by the Greeks and Egyptians in antiquity for the portrayal of deformities, has now been replaced for general purposes by simpler techniques. A direct cast from the actual specimen is the easiest and best method, the medium being applied over the object to produce a negative cast from which the final positive cast is moulded. With hollow structures like the bronchial tree or cerebral ventricles no intermediate stage is needed, for a direct negative cast can be made by filling the lumen with the casting material. Though the casting method is quick and accurate, care is needed to procure a smooth impression and to impart the correct colouring. Direct casting is sometimes impracticable, as with the irregular surfaces and crevices of surgical exposures and post-mortem dissections. Here an indirect method is used by making a freehand model in clay or other plastic which is then reproduced by casting. With this process essentials can be judiciously emphasised and non-*essentials eliminated; and it is particularly suitable for* such intricate structures as the ear, eye, or embryo in magnification. But it is very lengthy, and the colouring is quite inaccurate unless it is incorporated in the medium from the start.

Finally, various composite models have been designed to illustrate particular techniques; thus for training students in endoscopy a plaster cast of head and trunk can be combined with a modelled lesion at the end of a dummy gastroscope. On another page, Professor de Seigneux describes the use of models made in gelatin on a gauze basis to give the student experience of the appearance of tissues and their consistence to *palpation. Though useful in imparting* basic principles, especially in obstetrics, models can never replace practice on living tissues; passing a catheter on a dummy urethra or setting a fracture in a limb which does not swell after injury is not the best of preparations for undertaking these operations on patients. It is a pity that the modern increase in the student-patient ratio makes such substitutes necessary.

PHYSIOLOGY OF THE NEWBORN INFANT

THERE may now be little need to emphasise the principle that consideration of disease should be preceded by study of the normal. There are still, however, many gaps in our physiological knowledge, one of the largest being the effect of age on body processes. Physiology, as generally taught, is based on observation of fully grown animals and men. Differences between species are largely neglected; students sometimes feel that boys are not quite the same as men, but the view of their elders and betters seems to be that physiology is essentially the same throughout the vertebrate kingdom. The effect of age on a normal process is seldom demonstrated; and because few physiologists have interested themselves in the significance of age, progress has been retarded. Pædiatricians, for example, have been hampered in investigations and treatment by not knowing where the normal ended and the abnormal began; they have often been forced to work out the normal and its variations for themselves, and physiology owes these men a debt. Their findings, however, are scattered through the literature, and the time has come for a book on the physiology of infancy, bringing together all this knowledge.

Clement Smith[1] has now compiled just such a book, which will be welcomed by everyone interested in the subject. It is not very long—the second edition will probably be longer—but it is packed with facts, mostly

---

[1] Bulbulian, A. H. *Proc. Mayo Clin.* 1945, 20, 383.

[1] Physiology of the Newborn Infant. Clement A. Smith, M.D., professor of pædiatrics, Wayne University; medical director, the Children's Hospital, Michigan. Springfield, Illinois: Charles C. Thomas. Pp. 312. $5.50.

Students Guide

946 1947

Medical Schools

t OXFORD UNIVERSITY there are staff and accomdation to deal comfortably with some 60–70 students rly. Hitherto, most prospective students have come aight from school, but Service men and women already inquiring about places. The faculty is pertted to accept such students outside the quota, but lack of space and staff set an obvious limitation on mbers the competition for places will be greater than er, and the faculty is therefore discouraging the ceptance of foreign students for the present.

The general post-war policy of CAMBRIDGE UNIVERSITY to maintain the preclinical teaching at its previously gh level, and to develop a school of clinical research d postgraduate teaching in both specialties and neral medicine, rather than attempt to found a comete undergraduate school. This is in accordance with e recommendations of the Goodenough report. Plans r postgraduate work have begun to materialise with e reopening of the department of medicine and with e creation of chairs of experimental medicine and diotherapeutics. Other special departments which are ntemplated include pædiatrics, dermatology, social edicine, and chemotherapy. In all of these special epartments there will be opportunities for research udents and for those seeking training for long or short eriods. In general medicine, the experience gained ith ex-Service postgraduate courses has shown the eed, for the future, for regular courses for general ractitioners of scope and length adapted to their various eeds.

An essential part of this organisation has been he creation of a closer liaison between Addenbrooke's Iospital and the university, the first step being the ssumption of responsibility by the university for the athological and biochemical services of the hospital. ther services are expected to come into close association vith the university, including the regional laboratory ervices and a regional scheme for orthopædic and thoracic urgery and for neurosurgery. All of these plans are esigned to make the university the focus of medical esearch and teaching for the East Anglian Region.

London Schools

LONDON UNIVERSITY bears a different relation to its medical faculty from other universities: where they have one school of medicine each, London has the twelve autonomous schools of the teaching hospitals, as well as University, King's, and Queen Mary Colleges, all of which take medical students for some part of the course. In addition, external students of the university may take their clinical training at the West London Hospital, which is not a university school. The course has now been restored to its pre-war length. Candidates who passed the second examination for medical degrees on or after March, 1945, must now take a clinical course lasting not less than 30 months before entry to part I of the M.B., B.S. examination, and not less than 36 months before entry to parts II and III. The additional final examination which has been held in January or February in the last four years has been given up, and will not be held in 1947 or after. Both the first and second M.B. examinations can now be conducted internally. That is to say, students are now examined in their own schools, working at the benches and with the equipment with which they are familiar, like the students of other universities. The examinations are conducted by an internal and an external examiner; and the man who knows the daily work of the students can help to correct the impression made by a normally good student who is having a bad day with the apparatus and showing to poor advantage. The external examiner's opinion has, if anything, more weight, however; so there is no fear that favouritism might bias the issue. The effect is merely to give the student the best possible chance of doing himself justice.

The students of UNIVERSITY COLLEGE have now been back in their own buildings at Gower Street for over a year, but work is still seriously hampered by lack of space; for Government departments, despite continued protests, continue to occupy most of the useful territory of the school. Candidates for entry exceed the number of vacancies; places are particularly scarce in the first year, where the faculty of science must consider the requirements not only of medical students but of those doing pure science, dentistry, and several other subjects. The number of medical students could be increased only by crowding out some of these classes, all of which are essential. Hardly any young people coming direct from school will get places in the first year, since almost all the vacancies must be reserved for ex-Servicemen.

KING'S COLLEGE is one of the largest schools for medical studies in London, supplying students to four hospitals—King's College Hospital, Charing Cross, St. George's, and Westminster. Arrangements are made by which patients attend the college for clinical demonstrations in applied physiology, by clinicians. The scientific departments fortunately escaped serious damage from bombing, and repairs are now completed. The students hostel was reopened in October, 1945.

QUEEN MARY COLLEGE, now returned to London from Cambridge, has established once more its close contact with the London Hospital Medical College, and a joint committee composed of members of the governing bodies of the two colleges has been set up, as well as a teaching subcommittee, to coördinate 1st M.B. teaching. The numbers of medical students passing through the college during the session 1945–46 are 48 for the 1st M.B. and 24 for the premedical examination. A number of ex-Servicemen have joined the medical classes. All internal students now take the special internal 1st M.B. examination in July.

Post-war reablement is beginning to make some progress at UNIVERSITY COLLEGE HOSPITAL medical school. The many gaps in the ranks of its teachers caused by retirements are rapidly being filled, and the departments are beginning to resume their old activities. Expansion is inevitable, and space in which to expand is the constant demand of every chief. Sites and building permits are being eagerly sought and laboratory equipment is being tracked down. Modifications of traditional methods of teaching are being tried cautiously, with the object of achieving a more logical approach to the study of medicine. Teachers are keenly interested in the unpredictable effects of the proposed new health service on the quality of the students presenting themselves for medical training, and feel more firmly convinced than ever that it is essential to take the utmost pains to choose those who are likely to turn their training to the best account.

ST. BARTHOLOMEW'S HOSPITAL Medical College has now returned to London. The preclinical departments started work in their own college buildings, which have undergone temporary repairs, in April, 1946. The clinical school is partly restored to normal with a new clinical theatre, and the library and museum are again in use. In addition to the hospital in London, St. Bartholomew's is responsible for between 500 and 700 beds at Hill End Hospital, St. Albans. Six months in the last year of the clinical course is spent there on work in medicine, surgery, and gynæcology. Many of the gaps in both the preclinical and clinical staff which occurred during the war have been filled. The clinical curriculum has been lengthened from the two and a half years of war-time to a full three years, and the time students spend in the special departments has been materially increased. Although repairs to the damaged buildings are only temporary, accommodation is adequate. The new refectory in the college has exceeded original expectations, and it is hoped that permanent rebuilding of the college will soon be begun, and that the hospital will shortly acquire premises to be used as a students' hostel.

and, without previous competitive examination, they are free to matriculate at the age of 16 or 17. The bias thus strongly favours the more moneyed section of the population. This issue has a twofold implication—social and national: social in that the universities should, in a working democracy, be open to those most likely to benefit by the opportunities they offer; and national in that the country cannot afford to lose by default any that should be its intellectual leaders. A recent survey suggested that "about 5% (of the population) are as intelligent as the upper half (of the university students and graduates tested)."[1] It is admitted that intelligence should not be the sole criterion in the choice of undergraduates; nevertheless, this survey does indicate—what is indeed obvious—that many who have been denied it would have repaid the nation well for the chance of a university education.

What is the solution? Most enlightened educators seek to spread the net wider, by affording, irrespective of status, equal chances of competing for places at the university. The education committee of the L.C.C.[2] has declared itself in favour of the American omnibus or "multilateral" system, whereby all post-primary students attend a single school, and are educated according to their capacity, the competent being given ample opportunity of proceeding to college or university. In this, however, there are difficulties, including cost, the scarcity of teachers, and the risk of lowering the standard of school and university training if the doors are opened wide; and to these Sir Cyril Norwood adds: "Unemployed intellectual proletariats have emerged in various countries in the recent past, and they have not made for social health. It is unwise to breed beyond the means of subsistence."[3] Nevertheless, on the reverse of the coin we find[1]: "It is possible, though by no means certain, that we should be a better and happier nation if every crossing sweeper possessed a degree in Lit. Hum. What is more certain is that we shall be fortunate if by 1960 our schools and universities are turning out enough men and women with the qualities needed at all the different levels of employment." In the *Times*[4] Mr. William Connely writes:

> "The difference between the two countries [Britain and the U.S.A.] lies in the stage at which the weeding-out process sets in. In Britain the weeding-out occurs at the age of 11 plus; in America, seriously at the age of 22. Which is the more democratic? Which gives the wider opportunity to 'late developers'? . . . America has six times as many university students as Britain. But the important thing is that America has 100,000 postgraduate students—twice the number of undergraduates in Britain. These American postgraduates it is who eventually run the country."

It may be thought that the American system has much to commend it; but, if only for lack of teachers, it will not be seen here in the measurable future. Surrey County Council makes perhaps the nearest practicable approach in its plan to adopt a common system of secondary education for children of 11–13; on their records in these two years their aptitude for subsequent education at the grammar, technical, or modern school, as the case may be, will be assessed. There is some hope that eventually the examination at 11 or 12, to which most other bodies are adhering, will be replaced by consideration of school records, parents' wishes, and any other factor that the education authorities wish to include; but this must probably wait until a standard system has been accepted throughout the country. There is also hope that the initial division at 11 will not be too rigidly maintained, and that the boy who after entry to, say, a technical school shows exceptional promise may still be transferred to a grammar school from which he could proceed to the university. All such modifications as these are welcome.

With the best that can be done, selection will be made before, or in the early years of teen-age. In Britain tradition dies hard; and perhaps traditional education dies hardest of all. New methods, [illegible] their proved success in other fields, are but slowly acknowledged and still more tardily accepted. Even at the age of 11 or 12, the few who are outstandingly clever should by all means be admitted without [illegible] to a grammar school; but the claims of others who show promise, competing as they are for a restricted number of places, should be scrutinised by every method of known value. In the first place, examination results could be checked by intelligence tests; no single test is a valid indicator, any more than a single examination; but the sum of several tests is a guide whose worth cannot be overlooked. Otherwise, personality, interests, and aptitude should all be taken into account; a headmaster's report would have its value, not so much for any comment on the child's zeal for learning (which may be suitably reflected in his school record and by examination) as for the comment on his behaviour and his relation to other children. The present exclusive preoccupation with examinations in the formative years is not only wrong-headed but harmful; it stands damned for all to see in the youth who, having battled his way through the primary and grammar schools, finally reaches the university with a scholarship, exhausted, his intellectual life spent—an orange sucked dry. Others are injured in less overt fashion; concentration on examinations fosters the regard of learning as simply a means to success in the competition for places, so that when the university is finally attained, what should be a liberal education is seen as a series of coach-classes. "There is another matter," says Sir D'Arcy Thompson, F.R.S., "which makes, to my mind, a greater change since I was young; and that is the way men come to the university, not for the love and joy of learning, but for the business of passing an exam. They do not hitch their wagon to a star as so many of my old companions did; they only want a degree, and a job. In short, we have plenty of undergraduates, but a sad lack of students."[5]

If the universities are not to degenerate into technical colleges, those that come to them must arrive with fresh minds, thinking of education as something larger than a method of winning the struggle for advancement and the time to impart that vision is when primary education is begun. But such a reorientation is not possible until the teachers themselves have learned that the number of marks in an examination is not what they have held it to be—a satisfactory guide to competence. Nor can the hapless youth whose future may depend on an examination at the age of 11 be assured of a fair chance to show his merit until this lesson has been learned and acted on. We may disagree on methods of teaching and on methods of testing; but none who is interested in the nation's well-being will deny that any step towards a more rational use of our people's intelligence is a step worth the taking.

PSYCHOLOGY OF STUDY

A CORRESPONDENT who signs himself "Ex-Service M.O." writes as follows: "After taking the London degree examinations, one is amazed at the enormous volume of information the student is expected to digest, remember, and reproduce. Many of us who have recently been released from H.M. Forces have our eye on higher examinations, and would be glad to have some information on the technique of study. What is the best method of preparing for an examination with greatest economy of effort, while carrying on a full-time job? Perhaps some of your readers, including the psychologists, would kindly assist us with their advice and experience."

---

1. *Planning* broadsheet no. 253, issued by P.E.P., 16, Queen Anne's Gate, London, S.W.1.
2. Report of the general subcommittee (no. 5), July 11, 1944.
3. *Times*, August 8.
4. August 14.
5. *Times*, August 9.

During the past session the London (Royal Free spital) School of Medicine for Women has been l, and owing to the continued competition for the 100 cancies available each year. an entrance examination s again held in January to select the successful candi-tes for admission in October: 500 applicants entered this examination. Repairs to the extensive damage the school buildings, caused by a rocket bomb in bruary, 1945, have been carried on throughout the ssion. It is hoped that these will be completed by t. 1. and that all the work of the school will be carried in its own buildings from that date. During the past ssion the physiology and organic chemistry depart-ents have continued to enjoy the kind hospitality tended to them by Guy's Hospital medical school. he school buildings are overcrowded, but until repairs e completed it is impossible for any of the much-needed tensions to be carried out. Facilities for the teaching the clinical students have been increased by the opening of more wards at the Royal Free Hospital, nd by the allocation of a portion of the London Fever ospital, Liverpool Road. to the Royal Free. for use as n annexe. The opportunities for teaching at the lizabeth Garrett Anderson Hospital, which the school as enjoyed for many years, have been greatly extended, nd arrangements are being made to incorporate this ospital among the school's teaching hospitals.

St. Thomas's Hospital medical school is again oncentrated in its old home in London, on the south ank of the Thames opposite the Houses of Parliament. tudents, however. still spend one year of their training t St. Thomas's Hospital. Hydestile. near Godalming, oing inpatient clerking and dressing. There is every ope in the near future that sufficient beds will be open n London to enable the whole course of training to take lace there. The library is well stocked with modern extbooks and periodicals. and under its librarian plays n important part in school life. The museum will soon e open again, while the students' club. with its excellent ining-room and lounge, is available: other amenities re rising from the ruins of war. In teaching, strong mphasis is laid on the correlation of preclinical work ith subsequent clinical training, and by the time he has ompleted his second M.B. every student can use the tethoscope. ophthalmoscope, and auriscope. The nedical and surgical units are awaiting the appointments f new professors, while the pathological department is xpanding. and a chair of bacteriology is being estab-ished. Close liaison is maintained with local L.C.C. ospitals, and Pyrford Orthopædic Hospital is used for eaching. Like other hospitals, St. Thomas's is accepting 5% of women among new entrants. but hopes later to ncrease the annual entry to 20%.

The West London Hospital continues to train women students who have completed their preclinical ourse. This year the entrants will number about 30, which is the largest intake possible under present condi-ions. A number of new junior teaching appointments ave been announced, and the nearby Fulham L.C.C. ospital—where the dean of the school has been ppointed to charge of beds—is being increasingly used or clinical instruction. The future status of the hospital as an undergraduate teaching school is still under onsideration.

Westminster Hospital again has all its clinical students under one roof and in the past year has developed many of the plans made during the war for expansion and improvement. Arrangements are already being made to affiliate the hospital with other hospitals in the neighbourhood, and a professorial unit in clinical pathology, staffed and equipped to serve the whole group, has been established. The photographic department has been considerably strengthened, and a flourishing visual education unit has already developed. The Emergency Medical Service still has possession of some beds in the hospital, which makes it difficult to meet the urgent demand for postgraduate instruction: but courses have been arranged for regular officers of the Royal Army Medical Corps. and many old Westminster students released from the Forces have attended the practice of the hospital. It is hoped. moreover, that a number of beds at present used by nursing and domestic staff will shortly be released. for the Empire Nursing Home, in Vincent Square, has been purchased and is being prepared for their occupation. A hostel for students within easy reach of the hospital has been acquired and is already well filled. The clubs of the students' union are extremely active and many athletic and social functions interrupted by war have now been resumed.

The School of Dentistry of the Royal Dental Hospital of London admits students who have passed their science examination in zoology. botany. physics, and chemistry. They take courses in dental mechanics, metallurgy. and special anatomy for the first two years. and during this time they also study general anatomy and physiology. The anatomy and physiology courses are held at King's College in the Strand. For general medicine and surgery the students attend clinics at Charing Cross Hospital. There are also dental schools at Guy's. University College Hospital. King's College Hospital. and the London, but the other London medical schools offer no organised teaching for dental students; medical students of those schools, however. who wished to study dentistry could. of course. be credited with the general courses they had taken there.

Other English Schools

The University of Durham has restored its curriculum to the normal length with effect from the commencement of the academic year 1946–47. At the same time, new regulations for the final M.B., B.S. examination will become operative. and the first examination under the new regulations will be held in December, 1946. Under these regulations surgery and midwifery will form part I of the examination, and medicine and pædiatrics part II. It will be possible for students to present themselves for part I six months before they take part II. The demand for entry to the medical school remains, as elsewhere, very high and is accentuated by the large number of ex-Service applicants. The last year has seen the foundation of a department of surgery, under a whole-time professor, and the appointment of the Nuffield professor of industrial health. Senate has recently agreed in principle to the appointment of a whole-time professor of mental health and a whole-time reader in anæsthetics. These departments are likely to be established shortly.

With the return of many members of the staff from overseas the medical school of Birmingham University * is gradually returning to normal. Important new research schemes are being developed and teams are being built up for this purpose. It is hoped to announce in the near future appointments to the full-time chairs of medicine. surgery, midwifery, and pædiatrics. No outstanding changes have been made in the curriculum. but like other schools Birmingham will shortly be considering the suggestions made in the Goodenough report and the draft recommendations of the General Medical Council regarding professional education and examinations. The public health courses for the C.P.H. and D.P.H. will be resumed in October, 1946.

At Liverpool University,* where teaching of medicine dates back to 1789, there are today 16 professorial chairs and 585 students. The premedical course is taken in the faculty of science, and the preclinical course and clinical lectures in the medical school block, in the university quadrangle. The Royal Infirmary. where some of the clinical work is done, backs on to the university medical buildings. The damage done by bombs is now well on the way to repair. and new quarters are being provided for research laboratories and as offices for the department of surgery. The university has lately appointed whole-time professors in the clinical departments of surgery, and of obstetrics and gynæcology, and is preparing to appoint a professor of neurosurgery in the newly founded department of neurology. The department of child health,

---

* The entrance requirements for the Universities of Manchester, Liverpool. Leeds, Sheffield, and Birmingham are laid down in the pamphlet *Qualifications for Entry upon a Degree Course*, copies of which may be obtained from the Secretary to the Board. 315. Oxford Road, Manchester, 13. War Emergency Regulations are also in operation but will be withdrawn on Dec. 1, 1947. Any candidate satisfying those regulations before that date will be qualified to enter upon a degree course at any time. Additional faculty requirements may, however. be imposed: details can be obtained from the dean of the faculty of medicine in each university.

At CHARING CROSS HOSPITAL plans are complete for restoring war damage and for receiving women students. To relieve the bottle-neck of the preclinical years it has been decided to return to the school's original practice, and to teach anatomy and physiology on the spot, instead of sharing the opportunities offered at King's College. A new story to house these departments is to be built on the top of the present medical school, and will be in action, it is hoped, by October, 1947. These quarters, however, are merely temporary, for Charing Cross, following the Goodenough recommendations, plans to rebuild on an outlying site, near Harrow. A plan has been drawn up with the Middlesex County Council to provide, subject to the provisions of the new Health Bill, a teaching centre and a medical service for the area. The planning committees have striven to eliminate the spirit of competition from this combined voluntary and municipal scheme and to devise a truly coöperative centre of teaching and treatment. The new Charing Cross will be associated with a group of general and special hospitals, including the Central Middlesex and Redhill County Hospitals, the Hillingdon County Hospital, Shenley Hospital for Mental Diseases, Willesden and Hendon Fever Hospitals, Harefield for tuberculosis, and Mount Vernon for radiotherapy. The new centre will therefore serve the greater part of North-west and West Middlesex, with a population of a little over a million. The medical school will be incorporated, and have its own governing body; it is planned to admit a maximum of 100 medical and 50 dental students of both sexes yearly. All teachers will share equally the advantages and obligations of their position and the chances of academic promotion, whether employed by the voluntary or the municipal body. The new Charing Cross will take 100 chronic sick, and will have 300 beds for the admission, without selection, of patients in need of treatment in the area. There will also be 100 maternity beds, 250 beds for general and 80 for special surgery, 20 casualty beds, 210 general medical beds, 100 children's beds, and 114 beds in the special departments. An acute psychiatric unit of 40 beds has also been planned to work in conjunction with the county mental service, and a chest clinic, with 30 beds for tuberculous cases. This is by far the most constructive plan for collaboration between a voluntary hospital and a municipal service so far put forward; it deserves great success.

At ST. GEORGE'S HOSPITAL the tradition is to teach a relatively small number of clinical students in an intimate and individual atmosphere. It is the aim to preserve the spirit of this tradition in the hospital and a medical school of much greater size and scope which is to be built on a new site. In the interim before the move the staffs of both school and hospital are being augmented —a process bringing particular advantage to the present students whose numbers will remain the same until the clinical resources have grown greater. In the coming year the total number of beds at Hyde Park Corner will be increased by thirty for maternity cases. Neurosurgery, medical neurology, and psychiatry will be taught both there and at the Atkinson Morley branch; and pædiatrics at Hyde Park Corner and in the Victoria Hospital for Children, Tite Street, which is conveniently near. Fevers will then be the only clinical subject studied outside the parent hospital and its associates. This year the school will again accept a limited number of women students for clinical studies.

GUY'S HOSPITAL is now back on a pre-war basis, with the exception of those portions which were destroyed by enemy action. All the senior members of the staff have returned from the Forces, and with very few exceptions the junior staff are also back. The medical wards are in use again, and all those surgical wards which were *not structurally damaged have* been reopened. Beds are still retained at Orpington for the special departments (orthopædics, genito-urinary, and E.N.T.). The preclinical school has been working to capacity during the year, and the majority of the entries for the coming year are ex-Servicemen. Applications for admission *this year have* been extremely heavy but are limited by the accommodation available.

KING'S COLLEGE HOSPITAL medical school has now returned to Denmark Hill, except for the special departments of medicine and surgery, which are continuing at Horton Emergency Hospital, Epsom. Tuition in elementary medicine and surgery, pathology, midwifery and gynæcology, and medical clerkships and surgical dresserships, as well as outpatient instruction in the departments, is being carried on at King's College Hospital. At Horton Emergency Hospital, where nearly 1000 beds are available, inpatient teaching on special subjects, including medical and surgical diseases of the chest, is available during *the latter half of the* second clinical year. The teaching of industrial medicine includes a course of lectures by the medical officer of a large factory, and also a visit to a factory. In the last clinical year tutorial classes are taken by tutors in the various branches of medicine.

At the LONDON HOSPITAL the number of entrants slightly exceeds the pre-war figure, and the size of the school now is thought to be optimal. There is a large demand for entry among ex-Servicemen; unlike schoolboy entrants, few of these have passed their first M.B. examination, and the heavy *demand for instruction* in the first-year subjects may delay the start for some. The hospital, like others, has plans for rebuilding: both the medical school and the hospital, which is to be of about 1000 beds, *are* to be reconstructed on a nearby site, but it is not yet possible to say when the work can *be started. During* the coming year the hospital will be maintaining 600 beds at Whitechapel and 300 beds at the *annexe* at Brentwood—in *fact*, more beds than used to be maintained before the war. Both the parent hospital *and* the *annexe* will be used for teaching. All the staff have now returned, and *a* number of new appointments *have* been made recently. A department for medical diseases of the chest has been started, and will work in close conjunction with the department of thoracic surgery. The neurosurgical unit has returned from Chase Farm Emergency Hospital, and is being maintained partly at the London Hospital and partly at the annexe. Arrangements have been made for all students to live at the Eastern Fever Hospital for part of their course in fevers. They continue to visit Claybury Hospital for instruction in mental diseases. A professor has been appointed to the chair of medicine, which has been vacant for some time, and the medical unit has been reconstituted. Professorships of surgery and obstetrics are under consideration. In October there will be six general medical firms, one of which will work in conjunction with the cardiac department, and two others in conjunction with the neurological department. The thoracic surgery and neurosurgery, skins, physical medicine, and psychiatric beds are attached to general medical firms for the purpose of teaching.

At ST. MARY'S HOSPITAL the teaching staff has been considerably increased, partly by the return of members who were in the Services and partly by new appointments. The preclinical and clinical departments have thus been able to overcome most of the difficulties of the war years. Some improvements have been made to the laboratories and to the library; more will be done to the medical school buildings in general as soon as the labour situation eases. All clinical students have now returned from the sector hospitals and receive the whole of their instruction at the parent hospital. The demand for entry in the coming session has been very great, and 90% of the vacancies have been filled from the Services and other priority classes.

MIDDLESEX HOSPITAL students now do their clinical training entirely at the parent hospital, except for a few who still *attend* the Mount Vernon Hospital, Northwood, and the Central Middlesex Hospital. The arrangement for teaching at outlying hospitals has worked well, except that students have been a little hampered by being out *of touch with their own library and* museum. A number of new appointments have been made to the teaching staff, particularly in the junior grades. It is hoped that war damage will have been repaired, and the hospital completely reopened, in 6–9 months. The system of resident instruction in infectious diseases, *recommended* by the Goodenough Committee, has now been adopted, thanks to the coöperation of the L.C.C. The students feel that this way they get better instruction, and certainly the results hitherto have been encouraging.

Scotland

ABERDEEN UNIVERSITY has seen a busy and interesting ar. The members of the staff returned from service tled quickly to their old duties, and demobilised young aduates have shown a refreshing eagerness to get down the task of equipping themselves for their life's work. ere is increased activity in all branches of university ork. An appointment has been made to the chair of ental health, and clinical teaching of this important bject has been begun in the general hospital. A chair child health is to be established. New lectureships have en advertised in nearly all departments and some of em have been filled, but there seems to be a dearth of itable candidates for posts in the medical sciences—e result, no doubt, of the long period when young ctors had to go into the Services instead of being ained for this work. It will take several years to fill is unfortunate though inevitable gap. A full-time ost has been established. the holder of which will be in edical charge of all students whose homes are not in berdeen and of the nurses in the main teaching hospital. e will be expected to devote considerable attention to at aspect of social medicine which is concerned with the fluence of environmental conditions on mental and hysical health. Periodic medical examination is now mpulsory for all students entering the medical faculty, nd optional for the others. Plans have been prepared extend the hall of residence to accommodate 100 udents, and it is hoped that the necessary authority build will not be too long delayed; for, as in other cottish University towns, the lodging problem is becom-ng one of great difficulty, especially during the summer onths. and the importance of communal life as an tegral part of the education of students is becoming ore widely recognised.

At EDINBURGH UNIVERSITY there have been no mportant alterations in the medical curriculum, though etails of courses are constantly under review. The eneral Medical Council have not yet issued their ecommendations on the curriculum and the professional xaminations, on which a general revision of the course ill have to be based. The number of applicants for the LB. degree course beginning next October is expected o reach 1200–1300, and the Government decision hat ex-Service applicants must be given preference. f necessary to the extent of 90% of total admissions, must of course lead to the rejection of larger numbers f young people from the schools than has ever been he case before. Courses for the diploma in public ealth were resumed last January, and all places for the econd course, which begins in October. are already illed. It has not yet been finally decided to divide he course for the diploma in medical radiology into two ections—radiodiagnosis and radiotherapy—but it is oped to introduce separate courses in the two branches ext October. Many applications have been received or this course but it is unlikely that more than 12 andidates will be accepted. Courses for the diploma n tropical medicine and hygiene were resumed last January. Courses for the diploma in psychiatry are still n abeyance: completely new regulations are under onsideration. The university is considering the institution of a diploma in industrial health.

SURGEONS HALL. the school of medicine of the Royal olleges of Edinburgh, is a teaching body only, and holds no professional examinations of its own; it offers courses for the qualifying examinations of the Scottish, English, and Irish Conjoint Boards. The school is not a part of the university.

The faculty of medicine in the UNIVERSITY OF GLASGOW is now working almost normally. All the departments in the university and the associated hospitals are operating, and the teaching staff has almost regained full strength. The faculty admits 180 students annually to first-year medicine, and a small number of exceptional cases to the later years of the course. Selected candidates are interviewed. usually in July, but special arrangements have had to be made this year for ex-Service candidates. Women students are admitted on equal terms with men; and owing to the relatively larger number of women applicants. the educational standard of women admitted is very high. The curriculum at present extends over five years. but it is likely that a six years' curriculum, which was about to be introduced in 1939, will soon be brought into force, having first been reviewed in the light of official recommendations. The war-time arrangement of examinations, under which students have been able to graduate in a minimum period of four years and nine months. is being continued for the present. Four large general hospitals are associated with the university for clinical teaching in medicine and surgery. Obstetrics and gynæcology are taught mainly in the Royal Maternity Hospital, and pædiatrics in the Royal Hospital for Sick Children. The special subjects are taught in the appropriate departments of the numerous hospitals in the area. A large amount of postgraduate teaching is also undertaken. and it is intended to enlarge this field. Medical students join in the full life of the university, associating freely with students in other faculties. There are two large halls of residence for men students and two smaller halls for women students. and lists of private lodgings are kept by the Students' Representative Council. The Students' Unions occupy separate buildings within the university precincts. All students become members of the University Athletic Club on matriculation, and there is a Senior Training Corps, an Air Squadron, and a University Naval Division.

About 20 bursaries in medicine are available each year, and various additional bursaries, prizes, and scholarships are awarded to the best students in the faculty.

The extramural schools at Glasgow, ANDERSON COLLEGE and ST. MUNGO'S COLLEGE. offer courses in preparation for the examinations of the licensing boards and the universities.

Every final-year student of the UNIVERSITY OF ST. ANDREWS graduating in June. 1946, has held a resident hospital post. In future, owing to the claims for further instruction of medical officers returned from H.M. Forces, this may not be possible. The hospitals which applied for these clinical clerks have been favourably impressed with their work. as shown by reports from hospital authorities. The university has now reverted to its peace-time pattern in its examinations, the final examination being taken after 33 months of clinical study. Arrangements are being made to resume the course for the diploma in public health. but unless an appropriate whole-time lecturer can be found there may be some delay.

Ireland

The School of Physic of TRINITY COLLEGE, DUBLIN, in common with other medical schools. has been besieged by applicants for admission. Ex-members of the school returning from the Armed Forces are receiving priority, and it is proposed to allocate the limited number of places remaining to internal students who intend to take the entire premedical and medical curriculum in the school. Only those who have passed a recognised examination in the subjects required for matriculation to the university can be considered, as all candidates for the medical degrees are required to take the course and examinations for the B.A. degree in addition to the medical curriculum. Except in the case of local applicants, places in the school are allocated each April for the following October. Active consideration is now being given to the problems of reviving teaching for the diploma in public health and it is hoped that it may soon be possible to resume instruction for this diploma.

The conditions under which the diplomas in gynæcology and obstetrics and in psychological medicine are being awarded have been slightly modified.

The SCHOOLS OF SURGERY. Dublin. including Carmichael and Ledwich Schools, are attached by charter to the Royal College of Surgeons in Ireland. Students are admitted by competition in the preliminary examination. and the schools accept women as well as men. The preclinical study of physiology now includes special practical classes in which students, working on each other, are taught the use of instruments and methods used in the examination of the peripheral neuromuscular, cardiovascular, respiratory, digestive, and central nervous systems, of the skin, eye, and ear, and of the effects of exercise. An electrocardiograph and a small X-ray screening apparatus are among the equipment used. At the operative surgery class a course in the practical use of splints. plaster, and bandages has been included.

directed by a professor, was established during the war, and operates in both the voluntary and municipal children's hospitals. Clinical instruction in general medicine and surgery is given in the Liverpool United Hospital, which includes the Royal Infirmary, and in the major municipal general hospitals. Specialties are taught in the appropriate special hospitals, whether voluntary or municipal. As in other universities, various entrance scholarships are available details of which may be had from the Academic Department of the university. Halls of residence are provided for the students. The course has been restored to the full six years, of which at least three (and two at least after the first examination) must be spent in the university; the other three years may be spent in any recognised university or medical school. The university grants four higher medical degrees: *doctor of medicine, master of surgery, master of orthopædic surgery,* and *master of radiology.* The M.D. is granted on a thesis and an oral examination. The university also offers courses and examinations for diplomas in public health, and in tropical medicine and hygiene. Postgraduate fellowships and studentships are awarded on application to selected candidates for 1–3 years' research in all the principal departments of the medical school.

At MANCHESTER UNIVERSITY * a full-time chair of medicine has just been established, and a chair in association with the new department of industrial medicine was established last October. The war-time concession by which candidates were allowed to take the final M.B. examination after 30 months' clinical work is to be withdrawn, and the customary 36 months' work will be required after December, 1946. The courses for the diploma in public health have already been resumed, and it is hoped to renew the courses for the D.P.M. in October, and for the diploma in bacteriology some time next year. The university has taken the useful step of providing a certificate for psychiatric social workers, and the first course will be given this autumn.

In the past year no noteworthy changes have been introduced into the medical course at the UNIVERSITY OF LEEDS,* as adoption of the revised curriculum, outlined in the university's report on post-war planning, has been deferred until the General Medical Council's new recommendations on medical education have been considered. Meanwhile, the administration of the medical school has been strengthened by a new post—that of senior administrative officer. The newly created full-time chairs in medicine, psychiatry, and pædiatrics have been filled, and new chairs have also been instituted in chemical pathology, biochemistry, and pharmacology. Full-time chairs in surgery and in obstetrics and gynæcology are under consideration. New regulations, based on the recommendations of the G.M.C., have been approved for the diploma in public health, and a syllabus has been prepared for a course starting in September. Resumption of the course for the diploma in psychological medicine is being considered, but will not be possible next session. The midwife teachers' certificate course will begin again in October. Honours schools for the degree of B.SC. in anatomy, physiology, biochemistry, pharmacology, and bacteriology have been re-opened for approved medical students, and the course for the ordinary B.SC. degree in physiology has been planned afresh to allow candidates in the third year the option of reading either comparative physiology, work physiology, or nutrition and dietetics. Students preparing to take the diploma in dietetics, awarded by the General Infirmary at Leeds, will either take an approved course in domestic science and attend the diploma course for two years, or take a B.SC. in chemistry and physiology with an additional year of practical instruction at a hospital. The Government's delay in announcing their decision to fill up to 90% of the places with ex-Servicemen has immeasurably increased the difficulty of dealing with applicants for admission to the medical course next session. The pressure, already severe, on laboratory accommodation in physics and chemistry will be greatly intensified by the admission of large numbers of ex-Service people, while of applicants from school only those of exceptional promise, whether men or women, are likely to be admitted in the next two sessions.

At SHEFFIELD UNIVERSITY * the normal curriculum has been restored, and all teachers have returned from National Service; but deaths, retirements, and the institution of full-time clinical departments have necessitated many changes in staff. To cope with the increase in administrative work, a full-time Dean of Medicine will have to be appointed. As usual, the number of prospective students far exceeds the accommodation available, and the problem of duplicating classes will be faced if additional staff can be found. Numerous applications are being received from ex-Servicemen. Plans are being prepared and sites have been bought for building a new medical school and a new teaching hospital, but building restrictions prevent further progress at the moment. Recent new developments have been the establishment of departments of plastic and thoracic surgery. Revision of the curriculum in the light of the Goodenough report will be undertaken as soon as the new recommendations of the General Medical Council on medical education are known.

Since last year the clinical curriculum at BRISTOL UNIVERSITY has been restored to its normal length. A few ex-Servicemen were admitted to the medical school last October, and during the session some of the students who voluntarily broke off their studies in order to volunteer for the Forces have returned. Applications from ex-Service men and women for next October are very numerous, and the accommodation will be taxed to the utmost. Additional buildings of a temporary nature have been planned and will be erected as soon as possible in order to prevent "bottle-neck" departments from being the chief factor limiting student admissions. Considerable increases in staff are also being made to meet the programme of reconstruction of the medical school. During this session the university has appointed its first full-time professor of surgery. Refresher courses have been provided for ex-Service medical officers, and new postgraduate courses for specialist qualifications have been designed. The university now proposes to grant again its diploma of public health, which has been in abeyance for some years, and has also instituted new diplomas in medical radiology and in psychological medicine. Courses for these diplomas will probably be introduced next session. An Edgeworth Prize in physiology has been founded from a bequest made by the late Miss E. E. Edgeworth, sister of a previous professor of medicine.

Wales

THE WELSH NATIONAL SCHOOL OF MEDICINE continues to teach students mainly for the degree of M.B., B.CH. (Wales). For admission to this degree, candidates must normally hold a degree in arts or science requiring three years' residence in University College, Cardiff, before entering the school. During the war, however, and up to the present, this requirement has been suspended for students entering the college who have gained exemption from the premedical courses and examinations. The number of students admitted is governed by the available accommodation both in the college and the school, and is normally between 40 and 50. Any loss during the preclinical years is made up by the admission of students from other universities who are studying for qualifications granted by other licensing bodies. For the forthcoming session the University of Wales, like others, is required by Government decision to give absolute priority to ex-Service applicants who are academically qualified for admission, and it is anticipated that few students, male or female, will be admitted direct from schools. The school is administering for the Ministry of Health the scheme for postgraduate training of demobilised medical officers. The placing of class I officers in hospitals creates a little difficulty in finding resident posts for recent graduates, but an effort has been made to retain a sufficient number of vacancies for them. It is anticipated that this difficulty will not last long, and will not affect those now entering upon their studies. In addition to special courses for the ex-Servicemen and other graduates, courses for the certificate of public health (C.P.H.) and the D.P.H. (Wales), under the new rules of the General Medical Council, are being conducted, and those for the T.D.D. (Wales) in tuberculosis are being resumed.

in May and November, and regulations may be ned from the registrar, Apothecaries' Hall, Black s Lane, E.C.4.

MEMBERSHIP AND FELLOWSHIP

e Royal College of Physicians of London confers Membership (M.R.C.P.), which is obtained by ination. Examinations are held four times in each and medical graduates and licentiates of the college twenty-three years of age may sit for it. Details can obtained from the secretary, Royal College of icians, Pall Mall East, London, S.W.1. Fellows of college are elected annually at a general meeting e college.

e Royal College of Surgeons of England grants a wship to those passing the primary and final .S. examinations. Under the regulations which me effective from the end of 1943 undergraduates ot permitted to take the primary examination, which pen to those who hold a qualification registrable e British Medical Register and graduates in medicine surgery of universities and medical colleges recog- d by the council. Subjects of the primary examina- are anatomy (including normal histology), applied iology, and the principles of pathology. To be itted to the final examination candidates must uce evidence of having been engaged in acquiring essional knowledge for not less than 2 years after ng a recognised medical qualification. Dates of nination have been rearranged so that candidates pass the primary examination can proceed at once he final if they are eligible. Copies of the new lations and full particulars may be obtained from director of examinations, the Examination Hall, en Square, London, W.C.1.

edical graduates who have been registered, or ible for registration, for at least three years may ly for examination for Membership of the Royal lege of Obstetricians and Gynæcologists (M.R.C.O.G.). ticulars of the regulations may be obtained from the etary, Royal College of Obstetricians and Gynæco- sts, 58, Queen Anne Street, London, W.1.

he Fellowship (F.R.C.O.G.) is granted to Members are judged by the Council to have advanced the nce and art of obstetrics and gynæcology.

raduates may become Members of the Royal College Physicians of Edinburgh (M.R.C.P.E.) on passing an mination, particulars of which may be obtained from secretary, 9, Queen Street, Edinburgh, 2.

he Fellows are selected from among the Members the council of the college, and receive the designation .C.P.E.

ellowship of the Royal College of Surgeons of Edin- gh (F.R.C.S.E.) is granted to medical graduates who s the required examination; particulars of the ulations may be obtained from the clerk of the lege, Surgeons' Hall, 18, Nicolson Street, Edinburgh.

The Royal Faculty of Physicians and Surgeons of sgow grants, after examination, a Fellowship regis- ble by the G.M.C. as an additional qualification R.F.P.S.G.). Admission is by examination and subse- ent election. The candidate, who must be a licentiate of faculty or a graduate in medicine of a university or dical college approved by the faculty, may be exami- either in medicine or surgery. A candidate having ctised a specialty for at least 7 years may be examined that special subject if the council of the faculty proves. A candidate may also submit original pub- ed work, and if this is of sufficient merit he may be cused part of the examination. Details may be had m the secretary of the Royal Faculty of Physicians d Surgeons, 242, St. Vincent Street, Glasgow, C.2.

Membership of the Royal College of Physicians of land (M.R.C.P.I.) is granted on the result of an amination, the details of which may be obtained from e registrar of the college, 6, Kildare Street, Dublin. Fellows are elected by ballot from among the Members, d receive the designation F.R.C.P.I.

Graduates seeking the Fellowship of the Royal College Surgeons in Ireland (F.R.C.S.I.) must pass in two aminations, a primary in anatomy, physiology, and e principles of pathology, and a final in surgery. rther particulars may be obtained from the registrar, e Royal College of Surgeons in Ireland, Dublin.

The Faculty of Radiologists offers a Fellowship (F.F.R.) to medical graduates of five years' standing who have spent at least one year in general clinical work at an approved hospital, have practised radiology exclusively for three years, and have held a radiological diploma for at least two years. Candidates are required to pass an examination and submit a thesis. Candidates who hold higher medical or surgical qualifications may be exempted from the examinations in general medicine, general surgery, or pathology. Full particulars may be obtained from the warden, the Faculty of Radiologists, 45, Lincoln's Inn Fields, London, W.C.2.

SPECIAL DEGREES AND DIPLOMAS

The regulations for the following diplomas can be obtained by applying to the examining bodies concerned.

Public Health

A diploma in public health (D.P.H.) is granted by the English and Scottish Conjoint Boards, and by all the universities of the United Kingdom, except Oxford, Cambridge, and Sheffield. Durham, in addition to the diploma, offers the degree of bachelor of hygiene to medical graduates of any approved university who attend courses for part I of the examination at Durham; the degree of doctor of hygiene is conferred on those holding the B.HY. who submit an approved thesis and pass in an oral examination.

Courses for the D.P.H. were suspended at all universities except the three colleges of the University of Ireland during the war, but have already been resumed in most places, with curricula revised to meet the new G.M.C. requirements. The Welsh National School of Medicine is considering a revised course for the diploma. At St. Andrews resumption of the course is being delayed by difficulty in finding a lecturer.

Psychological Medicine

The universities of London, Durham, Leeds, Manchester, Edinburgh, Belfast, Dublin (Trinity College), Ireland (National University), and the English Conjoint Board offer diplomas in psychological medicine. (The University of London also grants a diploma in psychology, taken chiefly by social workers.) The courses for the diploma have not all been resumed. The standard is being reconsidered, and the English Conjoint Board has already issued new regulations which meet in a considerable degree the recommendations of the Royal College of Physicians for a five-years' training of psychiatric specialists. At Manchester it is hoped to begin the D.P.M. course again next session, and Bristol is considering introducing a course of the new type. At Durham, Leeds, Edinburgh, and Belfast courses have not been resumed. Trinity College, Dublin, has made changes in the course. London University is holding courses and examinations under the old regulations.

Radiology

The Faculty of Radiologists grants a fellowship (F.F.R.) which has already been mentioned. The universities of London and Edinburgh grant the D.M.R. Edinburgh hopes to give separate courses in radiodiagnosis and radiotherapy next session. The M.RAD. degree of Liverpool University is granted in either radiodiagnosis or radiotherapy. The London University course is being held as usual. The English Conjoint Board offers two diplomas: one in medical radiodiagnosis (D.M.R.D.) and one in medical radiotherapy (D.M.R.T.).

Tropical Medicine

Liverpool University jointly with the Liverpool School of Tropical Medicine grants a diploma in tropical medicine and hygiene (D.T.M. & H.) and holds a course for it. The University of Edinburgh and the English Conjoint Board grant diplomas in tropical medicine and hygiene (D.T.M. & H.). The Edinburgh diploma was resumed this year; and courses for the English Conjoint D.T.M. & H. will be held again at the London School of Hygiene and Tropical Medicine.

Gynæcology and Obstetrics

Medical graduates who are on the British Register, or eligible for registration on it, may apply to the Royal College of Obstetricians and Gynæcologists for examination for the diploma in obstetrics (D.OBST.). The Univer-

At QUEEN'S UNIVERSITY, Belfast, during the war, despite the absence of many of the staff with the Services, it was possible to maintain a full course of study. The number of students entering was limited, in 1939, to 112—the average number for the preceding three years—but has been raised to 130 this year as a concession to ex-Servicemen. Last year the Government grant to the university was extended, which made it possible to increase the staff, and to create additional registrarships in all the clinical subjects, as well as to strengthen the preclinical departments. The length of the course, shortened to five and a half years during the war, now reverts to six years. The diploma in psychological medicine is available for anyone holding the appropriate qualifications who wishes to sit for the examination. Courses for the diploma in public health are being resumed this year but will be confined to ex-Service candidates who are graduates of the university; not more than thirty can be accepted. The chairs of surgery and public health are now being made full-time appointments. As soon as materials become available the preclinical buildings are to be extended and the clinical departments rebuilt.

The NATIONAL UNIVERSITY OF IRELAND has colleges in Dublin, Cork, and Galway.

At UNIVERSITY COLLEGE, Dublin, the courses for the diploma in public health, interrupted during the war, were resumed last October. Courses have also been instituted for the diploma in child health of the university. It has never been the practice to hold courses at this college for the diploma in psychiatry.

At UNIVERSITY COLLEGE, Cork, the [illegible] has been discussed thoroughly, and in October, 1945 a special committee was appointed to consider changes. A general attempt has been made, without shortening courses, to prune away unnecessary detail, unprofitable practical work, and needless burdens on the student's memory. The college has 16 mm. sound equipment for films, and it is hoped that "if used in moderation it will be a useful weapon." The voluntary and municipal hospitals of the city have agreed to make all appointments of newly qualified men in collaboration with the medical faculty of the college. In future the emphasis is to be on clinical rather than laboratory medicine, and in order to ensure that each student has adequate clinical experience numbers have been limited, and only those who complete their first and second examinations within four years will be permitted to proceed with the course.

At UNIVERSITY COLLEGE, Galway, there have been no changes in the medical course or the regulations governing degrees in the past year.

Degrees and Diplomas

EXAMINING BOARDS

English, Scottish, and Irish Conjoint Boards

THE Examining Board in England of the Royal College of Physicians of London and the Royal College of Surgeons of England examines candidates for the qualifying diplomas of M.R.C.S., L.R.C.P. Candidates satisfying the board's regulations in regard to the preliminary examination in general education are eligible for admission to the premedical examination in chemistry, physics, and biology, and are required to complete the professional curriculum subsequently at a recognised medical school. The emergency regulations introduced as a war measure will hold until further notice. Under these, the medical course has been reduced from 57 to 54 months, and candidates are admissible to the last subject of the final examination after 30 months of clinical study instead of 33. The regulation permitting a candidate to enter for one part of the final after 24 months of clinical study still holds. Some other war-time concessions are still authorised in the regulations: for example, clinical study may be undertaken at any hospital provided the dean of the candidate's school is satisfied as to the instruction available and signs the certificate of study. Other modifications will be found in the Emergency Regulations, copies of which, with a calendar showing the dates of examinations, may be obtained, free of charge, from the secretary to the Examining Board in England, the Examination Hall, Queen Square, London, W.C.1.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have an arrangement by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas—designated by the letters L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.—of all three bodies. Candidates may work for the examination of the Scottish Conjoint Board at any of the recognised medical schools of Great Britain and Ireland. In 1938 the Triple Qualification committee of management adopted the suggestions of the General Medical Council for an extended medical curriculum, under which the course was to consist of a year of premedical work followed by a five-year medical course; but the committee reverted to the 1937 regulations as a temporary war measure. Under these the course lasts only five years and includes, in addition to the pre-registration examination, four professional examinations: the premedical examination (biology, chemistry, and physics); the second examination in anatomy and embryology, physiology, biochemistry, and biophysics; the third in pathology and bacteriology and pharmacology; and the final in medicine, surgery, midwifery, forensic medicine, and public health. Details may be had from the registrar, 18, Nicolson Street, Edinburgh.

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland accept candidates for the L.R.C.P.I. and L.M., L.R.C.S.I. and L.M. from most of the recognised medical schools at home and abroad. Full details of the regulations can be obtained from the registrar, Royal College of Surgeons in Ireland, Dublin.

Apothecaries' Licences

The Society of Apothecaries of London grants the L.M.S.S.A. Lond. to candidates who pass in the primary examination (which is held quarterly) and the final examination. Final examinations are held monthly except in September. The minimum period of study is normally five years. The four parts of the final examination may be taken together or in any order. Regulations and schedule of the required courses of study may be obtained from the registrar, Apothecaries' Hall, Black Friars Lane, E.C.4.

The Apothecaries' Hall of Ireland grants the diploma L.A.H. Dubl. to students who have passed the three professional examinations. The diploma confers on holders the right of registration on the Medical Register of Ireland and Great Britain. Examinations are held three times yearly, in March, June, and November. Further information may be had from the registrar, 95, Merrion Square, Dublin.

UNIVERSITY DEGREES

Bachelor of Medicine and Surgery

All the universities in the United Kingdom confer baccalaureate degrees in medicine and surgery, conferred on the results of examination.

HIGHER QUALIFICATIONS

Those who have graduated in medicine and surgery are at liberty to seek higher qualifications if they wish.

Doctor of Medicine and Master of Surgery

Graduates holding a bachelor's degrees can take the degree of Doctor of Medicine or Master of Surgery. All the universities in Great Britain and Ireland confer such degrees. The requirements vary and can be obtained from the different universities. At the University of Durham the degree of Doctor of Surgery (D.CH.) is offered in addition to degree of Master of Surgery (M.S.). Liverpool offers the orthopædic degree of M.CH. ORTH.

Master in the Science of Obstetrics and Master of Midwifery

The Irish universities grant the degree M.A.O. The Society of Apothecaries of London grants the Mastery of Midwifery (M.M.S.A.) upon examination in obstetrics, pædiatrics, and public health. The examinations are l opportunities for studying preventive medicine hygiene, and aviation medicine.

he DENTAL BRANCH of the R.A.F. is separate from the ical Branch, and appointments are still made ugh the Central Dental War Committee, organised he British Dental Association. Regular commissions still suspended, and candidates are appointed to the .F. Volunteer Reserve.

Health Services at Home

PUBLIC HEALTH

HERE has been steady expansion in the field of public lth since the first medical officer of health was pointed nearly a hundred years ago. In the early s the duties of the M.O.H. were largely concerned h sanitation, especially such matters as the safety water-supplies and sewage disposal. The work of pioneers in this field led to the general acceptance l application of standards; as a result, the need for ailed medical supervision of environmental hygiene been reduced, though in some rural areas there is l much to be done. The medical officer must now ain general control and supervision of the work, he largely delegates it to sanitary inspectors, health itors, and others. So long as the general control nains with the medical officer trained in public health re can be only good in this.

Control of infectious diseases has always been one of main concerns of the M.O.H. The old emphasis on lation of infected persons has now been replaced the provision of modern hospital treatment, but there nains the active home follow-up. Bacteriologists ve made great advances in the identification of different ains within certain of the pathogenic species, and ese new techniques applied to epidemic control have ven the M.O.H. an instrument of precision in much of epidemiological work. The application of specific ophylactic measures against various of the acute fections is now a major function of health departments. uch remains to be done, but the control of such diseases diphtheria and enteric fever is in sight.

During the last thirty years preventive clinical work s come to occupy most of the medical officers employed hole-time in public health work. The organisation of e maternity, infant welfare, and school health services presents a large part of the administrative responsibility of the M.O.H. of a county or county borough. is probable that there will be a steady increase in the rt played by appropriately experienced general practioners in the clinical side of this work, but its administraon must clearly remain with the M.O.H., who is sponsible for other preventive medical work. In unties one may look to the establishment of a divisional rm of administration, in which divisional medical ficers may deal with the detailed administration of ese preventive clinical services and the environmental ygiene in the same area. *This should lead to closer* sociation between public-health medical officers and eneral practitioners. The maternity services will aturally be closely associated with the hospital obstetric rvice, and the school health and infant welfare services ith pædiatric work in hospitals.

The tuberculosis and venereal disease services are ecialist clinical services which must be closely linked ith epidemiological and preventive work, in which oth clinician and M.O.H. are concerned. The provision f treatment is a hospital function, whether outpatient r inpatient, but more is required than this. The ollow-up of contacts in both diseases is of the highest nportance, and in tuberculosis there is a special field f family care. There is here common ground for the .O.H. and clinician which should lead to closer association, even though the hospital service now passes to nother authority.

Hospital administration has been one of the main reoccupations of the M.O.H. of the large county borough or ounty in the last sixteen years. The National Health ervice Bill provides for the transfer of hospital and pecialist services to new Regional Boards. There will be nedical administrative posts in the hospital service of the uture but the public health service, as such, will be freed rom the burden of hospital administration and enabled to concentrate on preventive medicine. The points of contact with the specialist services will be many, and full development of the social services of hospital and health department should lead to closer integration in the future.

The mode of entry to the service will probably not be, as in the past, through the clinical side, but through assistant administrative posts concerned with control of infectious diseases and organisation of clinic services. Thus there will be far less likelihood of medical officers who have taken postgraduate qualifications in public health devoting the rest of their professional lives to clinical work in a limited field. The very fact that those who undertake clinical preventive work will also be engaged in curative work will bring the administrative medical officer responsible for the organisation of clinic services into far closer contact with his professional colleagues.

The curriculum for the diploma in public health has been revised and now provides a first part which is suitable for men engaged in preventive clinical work or for those intending to specialise in tuberculosis or venereal diseases. A certificate is given to those who pass the examination for part I only. The course for part II provides for those who intend to take the diploma and enter the public service. Possession of a D.P.H. is necessary for anyone now appointed as M.O.H.

INDUSTRIAL MEDICAL SERVICES

THE stimulus which war gave to industry brought industrial medicine actively into the service of the country, for output depends on the health and well-being of the workers. The medical services will probably continue to grow in peace-time and it is likely that they will be integrated with the National Health Service. It is not possible to forecast the final form these services will take, but there is no doubt that many doctors in the future will find their life's work in industrial or occupational medicine. University chairs devoted to the subject have been set up at Manchester and Durham, and readerships are being established at Glasgow and Edinburgh. Again, the newly established chairs of social medicine at Oxford and Birmingham take industrial medicine (or industrial health, as it is now being called) under their wings, so students are likely to hear more about this subject in their undergraduate courses. Postgraduate courses are held from time to time in London, Birmingham, Sheffield, and Manchester. Diplomas in industrial health have recently been instituted by the Society of Apothecaries, the Conjoint Board of the Royal Colleges of Physicians and Surgeons, and Edinburgh University.

The term industry includes not only work carried on in factories, but also in mines and quarries, transport undertakings of all kinds, agriculture, and fisheries. Several Government departments deal with various aspects of the industrial medical services. For instance, the Post Office, which employs more workers than any other department, has had a medical service since 1855, and, because it deals with engineering and manual workers in addition to office staffs, is partly an industrial medical service. Other Government departments, such as the Ministry of Fuel and Power, the Ministry of Supply, and, in a minor degree, the Ministry of Health through the local authorities, play some part in controlling industrial health services. But of all the departments supervising industrial health the main one is the factory department of the Home Office, seconded in 1940 to the Ministry of Labour and National Service.

FACTORIES

The factory department administers the Factories Act of 1937, with its regulations on accident and sickness prevention, hours of work, amenities, first-aid and ambulance rooms, and canteens. The staff now numbers 401, of whom 12 are medical inspectors. All members of the department, whether lay or medical, take part in the activities directed towards preventing illnesses and maintaining the health of the factory population. The medical inspectors are at present stationed in London, Birmingham, Sheffield, Liverpool, Manchester, Glasgow, and Wolverhampton, and from these centres are able to deal with factory health conditions in any part of the country. Under them 1750 general practitioners give part-time service as factory examining surgeons, examining all young entrants into industry, and periodically sity of Dublin also offers a diploma (D.G.O.) for which a course is held at Trinity College and the Rotunda Hospital; there have been some changes in the regulations this year. The Mastery of Midwifery granted by the Society of Apothecaries of London has already been mentioned.

Ophthalmology

Three examining bodies issue diplomas in ophthalmology—the University of Oxford (granting the D.O.), and the English and Irish Conjoint Boards (granting the D.O.M.S.). The Royal College of Surgeons is applying for a Supplemental Charter to enable ophthalmological candidates to obtain the F.R.C.S. on passing the ordinary primary examination and a special final examination equal in standard and similar in form to the ordinary examination.

Laryngology and Otology

The English Conjoint Board offers a diploma (D.L.O.) for those who have made a special study of the ear, nose, pharynx, and larynx.

Anæsthetics

The English and Irish Conjoint Boards offer diplomas in anæsthetics (D.A.). Candidates must have special experience in giving anæsthetics.

Child Health

Diplomas in child health (D.C.H.) are granted by the English and Irish Conjoint Boards; also by the National University of Ireland, with a course at University College, Dublin.

Tuberculous Diseases

Courses and examinations for the diploma in tuberculous diseases (T.D.D.) of the University of Wales have been resumed.

Bacteriology

Diplomas in bacteriology are ordinarily granted by the universities of London and Manchester and both are resuming courses next session. The course for the London University examination will be held at the London School of Hygiene and Tropical Medicine.

Clinical Pathology

The University of London offers a diploma in clinical pathology (D.C.P.), for which a year's course of study is required.

Physical Medicine

The English Conjoint Board offers a diploma in physical medicine (D.PHYS.MED.). Candidates must have held a registrable qualification for two years, and must have had two resident appointments occupying not less than a year.

Orthopædics

Liverpool University offers the degree of M.CH.ORTH., and courses for it are being resumed next session.

Industrial Medicine

The Society of Apothecaries of London and the English Conjoint Board have both, during the past year, instituted diplomas in industrial medicine (D.I.H.).

DENTAL DEGREES AND DIPLOMAS

There are schools of dentistry at the universities of London, Durham, Birmingham, Liverpool, Manchester, Leeds, Sheffield, Bristol, St. Andrews, Belfast, and Dublin; and at the University Colleges of Dublin and Cork, in the University of Ireland. Leeds grants a diploma (L.D.S.), a baccalaureate degree (B.CH.D.), and a mastership (M.CH.D.). The University Colleges of Dublin and Cork grant a B.D.S. and a M.D.S., and Trinity College, Dublin, offers a B.DENT.SC. and a M.DENT.SC. All the other universities mentioned except London offer L.D.S., B.D.S., and M.D.S. degrees; St. Andrews offers a diploma in public dentistry (D.P.D.) in addition. London University prepares students for the L.D.S. of the Royal College of Surgeons. Licences in dentistry are also granted by the Royal College of Surgeons of Edinburgh, the Royal Faculty of Physicians and Surgeons of Glasgow, and the Royal College of Surgeons in Ireland. The Royal College of Surgeons of England is applying for powers to grant a higher dental diploma, to be called a fellowship in dental surgery of the college.

The Defence Services

Royal Naval Medical Service

The usual regulations governing entry of medical dental officers to the Royal Naval Medical Service suspended during the war, and the only medical of at present being admitted are those granted temp commissions in the Royal Naval Volunteer Res Candidates for entry must have had at least 6 mo experience in a house appointment. Some vac will be filled by selection of officers from among th who have served in the R.N.V.R. during the war. small number of women medical officers are s as surgeon lieutenants R.N.V.R. and one as sur lieutenant-commander R.N.V.R. (at Medical Departm Admiralty).

Candidates for the Royal Naval Dental Service m be registered under the Medical or Dental Acts and m also have a registrable qualification in dental surgery. T method of entry is similar to that for medical officers

Opportunities are given to medical and dental o R.N.V.R. to apply for transfer to the Perman Service R.N. after about 6 months' service.

Royal Army Medical Corps

No direct applications for regular commissions in th R.A.M.C. are being invited at present. On the nominati of the Central Medical War Committee doctors a appointed to emergency commissions with the rank o lieutenant. Medical officers, after serving as emergen commissioned officers for one year on full pay, now ha an opportunity of applying for a regular short-serv commission under conditions set out in Army Coun Instructions, and may subsequently be considered f permanent Regular Army commissions. The conditi governing the granting of these commissions are a present being revised. Recently qualified doctors wish to be appointed to emergency commissions sh apply to the secretary of the Central Medical W Committee, at B.M.A. House; or if resident in Scotl to the Scottish Central Medical War Committee, Drumsheugh Gardens, Edinburgh, 3. Applicants sh have held an appointment either as house-surgeon house-physician for six months.

ARMY DENTAL CORPS

As in the R.A.M.C., no direct applications for re commissions in the Army Dental Corps have been inv since the outbreak of war. All war-time app ments were to emergency commissions for the dura of the war; but dental officers, after serving as emerg commissioned officers for one year on full pay, h an opportunity of applying for a regular short-ser commission. At present conditions in this service a being reviewed. Recently qualified dental surg wishing to enter the Corps should notify the secret of the Central Dental War Committee, at 13, Hill Str London, W.1, or in Scotland the secretary of t Scottish Central Dental War Committee, c/o the Depar ment of Health for Scotland, Edinburgh, 1.

Royal Air Force Medical Branch

Since the end of the war arrangements in the R.A.F have changed slightly. Commissions in the Medic Branch are still only given to those appointed to R.A.F. Volunteer Reserve, and short service commiss are still in abeyance, but a limited number of perma and extended service commissions are being granted.

Newly qualified doctors must have held a six mont house appointment in a civil hospital before be considered for service in the Medical Branch. Candid must register with the Central Medical War Committ through whom an interview and medical examinati are arranged at the Medical Directorate of the A Ministry. Doctors normally enter the Service with t rank of flying officer and are automatically promot to the rank of flight-lieutenant at the end of a y if recommendations are satisfactory. Specialists en the Service with a higher rank, but vacancies are r tively few. Flying officers begin with a short cou at the Medical Training Depot, and are then posted t operational units, training units, recruiting centres general or station hospitals, at home or overseas. Besi ordinary general medical work, the medical officer h

examination; 18 of them for the final F.R.C.S.
nation and the diploma in anæsthetics, and a
er for the diploma and membership of the Royal
e of Obstetricians and Gynæcologists. Seven general
als and Queen Mary's Hospital for Children, Car-
n, are partially recognised for the diploma in child
by the Royal Colleges of Physicians and Surgeons.

MENTAL HOSPITALS SERVICE

E public mental hospitals in England and Wales
he responsibility of the local authorities. Apart
those hospitals administered by the London County
cil, there are 65 hospitals under the control of
y councils, and 26 hospitals under the control of
y borough councils. The hospitals vary in size
the small borough mental hospitals with about
eds to the large county mental hospitals with over
beds.

cording to the interim revision of the Askwith
orandum published this year, assistant medical
rs to mental hospitals receive a minimum com-
cing salary of £455, rising by annual increments of
o £555 yearly, with emoluments which must include
d, lodging, laundry, and attendance. In addition,
medical officers who possess a diploma in psycho-
al medicine receive a further £50 per annum.
ble provision is made for the accommodation of
ied assistant medical officers. In the higher posts of
ity medical superintendent and medical superinten-
no uniform scale of salaries is laid down, and these
between the different hospitals. In addition to
y, emoluments are provided which usually consist
house, furnished or unfurnished, fuel, and light.
nanent medical appointments are in all cases estab-
d posts within the meaning of the Asylums Officers'
erannuation Act, 1909.

osts at these hospitals offer medical officers scope
initiative and promotion. Very few new appoint-
its were made during the war, and medical staffs
e been much curtailed. There should be good openings
hese immediate post-war years.

he mental health services of the L.C.C. are responsible
a large medical service, vacancies in which are
ertised from time to time. An applicant enters
service as assistant medical officer at a salary
£575 a year, rising by annual increments of £25 to
5. Salaries are graded through the various ranks to
00, plus a cost-of-living bonus of £90 (£72 to £82 for
nen), paid to superintendents of large hospitals: a super-
ndent is also provided with an unfurnished house on
hospital premises. Assistant medical officers may be
uired to live in the institution which they are serving
l to pay fixed rates for board, lodging, and laundry.
icers contribute to a superannuation fund. They are
uired to take a diploma in psychological medicine
hin three years of entering the service and the diploma
ries with it a payment, in addition to salary, of £50
ear. Promotion is reasonably rapid for men.

MINES MEDICAL SERVICE

HE Mines Medical Service now consists of eight
ional mines medical officers, with a chief mines
dical officer and a deputy at headquarters.

he white-paper on coal proposed the establishment
this service "with a view particularly to checking
stage of labour." Thus much of the work of the
dical staff is concerned with applications for release
m the industry on medical grounds. Before the
dical service was founded all such applicants were
t by the Ministry of Labour for independent medical
mination. The functions of the service have been
fold: to relieve the workman of such examination,
he medical evidence put forward by him was suffi-
ntly conclusive: and in doubtful cases where inde-
dent medical examination is necessary, to secure a
h standard of examination. These services have
n of value both to the workmen individually and in
ping to check unwarranted wastage of labour. But
as always been realised that these activities, essential
they are at present, are not constructive, except in
t they lead to better medical or surgical treatment
the patients concerned. From the start the medical
cers have been enjoined to devote all the time possible to professional activities at the mines and in connexion with the hospitals, rehabilitation centres, and other institutions to which the miners go for treatment. Professional work at the mines themselves is increasing in volume. Medical officers have charge of the first-aid and ambulance arrangements both below and above ground; they study the working conditions in relation to the miners' health, and are getting a wide first-hand experience of the coal-mining community at work. Special attention is being given, and will be given increasingly, to a practical study of the causes of the so-called industrial diseases, and to measures for preventing or alleviating them. The field to be covered is wide, and previous work and experience have already shown that there are no easy roads to speedy improvement; but it is hoped to improve conditions gradually by concentrating on particular difficulties and problems. Several studies of this kind are already in hand. The use of morphine for the first-aid treatment of cases of painful injury underground has proved beneficial. A large number of cases have been treated with good results, the drug easing the patient and lessening the shock. The conditions governing the use of the drug at mines are strictly enforced. Various industrial hazards, such as dermatitis, epidermophytosis, Weil's disease, and occupational diseases such as the "beats" and pneumoconiosis, are continuously studied. The medical officers have also prepared the way for the establishment of medical treatment centres at collieries, and for the appointment of State-registered nurses to work in them. The regional mines medical officers will assist in the selection of nurses and will guide and generally advise them at the treatment centres in the early days of their appointment. The medical service is looking forward to the time when the whole of its energies can be concentrated on constructive work of this kind, and in the meantime will devote to it all the time that can be spared from dealing with the temporary problems and difficulties still arising out of the war.

PRISONS

At the larger prisons whole-time officers are appointed, sometimes with deputy medical officers to assist them. Unfurnished quarters are provided or an allowance made in aid of rent. Posts are pensionable and promotions are made as vacancies occur. Candidates with a diploma in psychological medicine receive £50 per annum more on appointment than candidates without this qualification, and are given preference provided they also have good all-round general experience. At the smaller prisons no whole-time officers are employed; local practitioners are usually appointed as part-time officers. Further particulars can be obtained from the Prison Commissioners, Horseferry House, Thorney Street, Westminster, London, S.W.1.

State Boarding-schools.—In the past local education authorities have been concerned with boarding-schools mainly to provide for handicapped children and those healthy children who are unable to attend day-schools. Under the Education Act of 1944 local authorities must see that boarding education is open to all children for whom these authorities and the parents consider it desirable. This has been carried a step further in a Ministry of Education circular (no. 120, H.M. Stationery Office, 1*d*.). It explains the existing resources in county and voluntary, and in direct-grant schools, and mentions the arrangement already reached whereby local authorities may support pupils at independent schools outside the State system of education. It is hoped that these arrangements will be increasingly employed and that the independent schools will be willing to reserve more places for children educated at the public expense. The Minister is now to assemble a small committee to collect precise information of the boarding places in all types of schools available for the use of education authorities (apart from those earmarked for local purposes). At the same time the committee will work out a procedure by which the pooled vacancies can be sought by individual local authorities and can be fairly allocated. Local education authorities will be responsible for the selection of pupils and, where necessary, for payment of appropriate expenses under an approved income scale. The aim is to develop speedily boarding education for all suitable pupils.

all those engaged in dangerous processes. They also issue certificates under the Workmen's Compensation Act for scheduled industrial diseases.

The mines medical service, described below, is responsible for the health of miners. The silicosis and asbestosis medical board consists of 11 whole-time medical officers and some part-time doctors. In addition about 10 whole-time temporary medical officers are employed in the South Wales area to assist in dealing with outstanding claims from miners for compensation for pneumoconiosis. The members of the board have special experience of chest diseases and issue compensation certificates to workers who develop silicosis or asbestosis; they also examine periodically workers in industries liable to produce these conditions. A separate board consisting of three doctors was set up in Manchester in 1941 to supervise cotton-workers who develop byssinosis, and to issue compensation certificates. All workmen's compensation schemes used to come under the Home Office but are now under the Ministry of National Insurance.

FACTORY MEDICAL OFFICERS

Before the war the practice of appointing whole-time or part-time works' medical officers was not universal; then there were only about 50 doctors employed in industry. But, partly as a result of the Factories (Medical and Welfare Services) Order, 1940, made by the Ministry of Labour and National Service, there has been an increase in the number of works' doctors. In 1943 there were 926 of them, of whom 63 were women. Whole-time doctors numbered 176 and part-time 750. The numbers would have been much higher had there not been a great shortage of doctors owing to the call-up for the Forces. During the war the Ministry of Supply built up a factory medical service under a chief medical officer. Both whole-time and part-time doctors were appointed to various factories throughout the country. Many of these war-time appointments are likely to become permanent now the war is over, since employers who experience the benefit of a well-run medical service in a factory rarely abolish it. At present works' doctors, except those in Government factories, are paid by private employers or firms. The workers in some cases tend to distrust the doctors' opinions on this account. Under a comprehensive medical service it should be possible to arrange that the doctor is employed by the State or some other neutral body.

Medical officers of factories who are interested in social problems have wide opportunities for their study and can also undertake the teaching of health and hygiene. They can strengthen the bonds between the factory service and the general medical and hospital services, treat accidents, reduce the chances of sepsis, follow up serious cases, and ensure that patients all return to work in the shortest time compatible with adequate treatment and reablement. Inevitably they will have to play an important rôle in the schemes for resettling disabled persons (whether from the fighting or civilian services) in industry. With their first-hand knowledge of the processes carried out in the factories, and of the physical and mental capacities of the workers, they will be able to place the disabled persons in suitable jobs and keep them under observation.

INDUSTRIAL HEALTH RESEARCH

Apart from the investigations and research into industrial diseases conducted by the medical inspectors of factories, the mines' medical officers, works' medical officers, and examining surgeons, much fundamental research into environmental conditions has been carried out by the investigators of the Industrial Health Research Board of the Medical Research Council. Problems investigated include those of hours of work, lighting and vision, heating and ventilation, accident-proneness, and sickness-absenteeism. The investigations have been mainly physiological and statistical, but clinical studies have also been made under the ægis of the Industrial Pulmonary Diseases Committee of the Medical Research Council, and include inquiries into the pneumoconiosis of South Wales coal-miners and the byssinosis of cotton-operatives. It became apparent that more clinical research into occupational diseases was needed and the council in 1942 appointed a director of research in industrial medicine. Finally, in 1943, a department for research was established under the council at the London Hospital.

The Association of Industrial Medical Officers formed some years before the war by doctors interested in various aspects of industrial health, and branches have been established in various parts of the country. The new *British Journal of Industrial Medicine* is sponsored by the A.I.M.O. in conjunction with the British Medical Association. Information about the association may be obtained from the Secretary, c/o Standard Telephones and Cables Ltd., New Southgate, N 11.

LONDON COUNTY COUNCIL HOSPITALS

THE hospitals service of the London County Council provides special facilities for undergraduate instruction and opportunities for experience for medical graduates who intend either to be general practitioners or consultants or to enter the L.C.C. Public Health and Hospital Service. At the beginning of the war the service contained 97 hospitals with beds for 71,094 patients. The 97 hospitals consist of 44 general hospitals, 32 special hospitals, and 21 mental hospitals and institutions the mentally defective.

Treatment is provided in these hospitals for all kinds of acute and chronic illnesses, including fevers, tuberculosis, mental and nervous disorders.

HOSPITALS BRANCH

Medical superintendents of the hospitals, who are expected to be experienced hospital administrators, receive £1000 to £1800 a year, in hospitals with accommodation for from 100 to 1300 patients. In addition, medical superintendents are provided with an unfurnished house or quarters with payment by the Council of local and water rates.

The other full-time medical staff are classified as:

Grade	Annual sa (ba
Deputy medical superintendent, class I	£850–£50–
Deputy medical superintendent, class II	£800–£30–
Deputy medical superintendent, class III	£725–£25–
Deputy medical superintendent, class IV	£650–£25–
Senior resident surgeon, physician, or obstetrician, and senior assistant medical officer	£650–£25–
Assistant medical officer, class I	£155–£25–
Assistant medical officer, class II	£325
Senior house officers	£260
House-physicians and house-surgeons	£156

These officers are provided with board, lodging, and laundry. Clinical assistants, who are non-resident, receive £105 a year, with meals when on duty. Vacancies in the higher grades are filled as far as possible by promotion from the existing staff. In addition, a large number of part-time consultants and specialists are employed in the various hospitals, as well as some whole-time non-resident specialists at a salary of £1400–£50–£1650. In addition to basic salary, medical staff receive the cost-of-living allowance applicable to all the council's professional grades of staff.

A central histological laboratory, as well as several group laboratories of the pathological service, serve a number of hospitals. Attached to the group laboratories are subsidiary laboratories situated in the various hospitals. Normally a medical staff of 25 is attached to these laboratories.

TEACHING FACILITIES

Courses in fever hospital administration for the diploma in public health, which were suspended during the war period, are now being held when required; refresher courses for medical officers released from H.M. Forces are held by arrangement with the British Postgraduate Medical Federation, University of London; other postgraduate facilities remain as they were. The British Postgraduate Medical School is at the Council's Hammersmith Hospital.

Increased use is being made of the Council's hospitals for teaching purposes. Arrangements have been made whereby maternity students have had training and experience in the maternity departments of the Council's general hospitals. The fever hospitals also provide for undergraduate instruction, and, when patients are available, for demonstrations in the diagnosis and treatment of smallpox for both undergraduate and postgraduate students. Students are resident during their course of instruction in some of the fever hospitals.

Most of the general hospitals are recognised training centres for candidates for the University of London rincipal town of each there is a large and well-ped hospital. In the smaller towns there are other ;als each in charge of a Sudanese doctor, and there ›me 400 dispensaries serving the still smaller towns ural areas. British medical inspectors are attached e main hospitals and may also supervise the areas iich they serve.

there are hardly any private practitioners in the ry all medical, surgical, gynæcological, and public-h and preventive work is carried out by members e service. There is also a varying amount of adminis-;e work to be done: medical boards must be held. school-children examined. Though it may be ble for work in the outstations to be arranged so a man who is keen either on medicine or on surgery be able to devote himself more to the branch he rs, all junior members of the service should be etent to undertake whatever comes their way. At ent most specialist appointments are filled by selec-from the more senior medical inspectors, and such notion, which depends on the occurrence of vacancies, re before 12 or more years of service. All specialist intments are held in the Khartoum-Omdurman , and the holders may be called upon to act also as rers and teachers in the Kitchener School of Medi-receiving fees, additional to their pay, for their ices in this capacity.

edical inspectors, if appointed on probation for ion, enter scale C5 at £E.720, unless a higher salary anted in recognition of age, experience, and qualifi-ons. Candidates over the age of 26½ who have war ice will have their starting salary fixed in such a as to give them credit for such service. Pay in C5 rises by 5 biennial increases to £E.1080, followed r 3 years at that rate by an increase to the maximum E.1200.

edical inspectors have prospects of promotion to s carrying a higher salary. At present these are:

irector	maximum	£E.1800
ssistant Director, Research ..	,,	£E.1500
ssistant Directors	,,	£E.1400
ecialist posts (in medicine, surgery, gynæcology, and ophthalmology)	maxima	£E.1750–1400
ovince Medical Inspectors.. ..	maximum	£E.1300
edical Officer of Health	,,	£E.1300

o income-tax is at present payable in the Sudan.

he probationary period is usually 2 years, after ch, subject to passing the prescribed Arabic examina-, and to the recommendation of the director, a medical ector is eligible for permission to join the pension me, which includes provision for widows and orphans. tributions are at the rate of 5% of salary, and retire-nt on pension is allowed at 48 if by that time 15 s' service has been completed. After 24 years' service pension is half of the mean of the last two years' ry. A gratuity is payable on voluntary retirement r 7 years' service.

rivate practice is permitted, provided that it does interfere with official duties, but except in a few of larger towns the opportunities for private practice few. A doctor is not allowed to charge private fees work performed in a Government hospital.

normal times leave of 90 days is granted every year r the first 18 months of service, and study leave may iven in addition for special purposes, but not usually l after 7 years' service has been completed. Full is drawn during leave periods and there are allow-s towards the cost of passages for officials and r families. No free quarters are provided. Govern-nt houses can usually be obtained on payment of and other charges. These vary according to the ion and the accommodation available but are usually veen £E.40 and £E.80 per annum.

he service provides good professional work combined an open-air life. Work may mean travelling on ection tours by rail, steamer, air, car, or animal sport. The climate varies from the hot dry Northern , through the central area which has a 3–4 months' y season, to the Southern zone, in which conditions ome increasingly tropical as the southern border of Sudan is approached. The general level of the ntry rises from 1200 feet at Khartoum to 2000 feet above the sea at Nimule, on the Uganda frontier. There are good opportunities for exercise—tennis, golf, and polo being the main afternoon games. There are swimming pools in the larger towns. In the Southern zone there is plenty of shooting and in many places very good fishing.

Applicants in the United Kingdom must be British born and should be under 30 years of age and preferably unmarried. An official is allowed to take a wife out to the Sudan after reaching the age of 27 or on completing 4 years' service, whichever happens first. Candidates selected for appointment will as a general rule be required to undergo a course of instruction at either the London or Liverpool School of Tropical Medicine, before sailing. The tuition fees are borne by the Government and a subsistence allowance of not less than £E.5 a week is paid during the course.

Candidates selected for appointment with the Sudan Government receive free transport from their home to their station in the Sudan. As appointment dates only from the date of their arrival at the Sudan frontier, they are given to cover the cost of the journey an allowance not less than the salary they would have earned if their appointment had dated from the date of embarkation for the Sudan. The conditions of service given here are liable to alteration in accordance with Government regulations. Further particulars and information about vacancies may be obtained from Dr. H. C. Squires, C.M.G., Consulting Physician to the Sudan Government, 93, Harley Street, London, W.1. (Telephone: Welbeck 3423.)

REGISTRATION

NO-ONE is a legally qualified medical practitioner unless his name appears on the Medical Register kept by the General Council of Medical Education and Registration of the United Kingdom. The council is a standardising body, ensuring that there is a prescribed minimum of medical education and examination requirements; it is also responsible for discipline within the profession.

The number of students admitted to medical schools in Great Britain and in Eire during the academic year 1944–45 was 2612, and for the year 1945–46, 2610.

NUMBERS OF UNDERGRADUATES AND PRACTITIONERS IN THE YEARS 1936–45

Year	Starting study in October	New graduates						Total no. in register on Dec. 31
		England	Scotland	Ireland	Colonial	Foreign	Total	
1936	2544	920	490	223	260	12	1905	59,010
1937	2297	1096	598	239	273	13	2214	60,163
1938	1735	1150	590	295	277	53	2365	61,420
1939	2623	1437	692	356	296	187	2968	63,410
1940	2398	1323	673	315	57*	16*	2384*	64,679*
1941	2361	1189	632	285	134*	1056*	3296*	66,995*
1942	2468	1663	593	381	206*	713*	3556*	69,428*
1943	2426	1501	611	405	153*	862*	3532*	71,882*
1944	2612	1196	619	307	320*	529*	2971*	73,646*
1945	2610	1268	581	428	124*	265*	2666*	75,133*

* Including temporary registrations

The number of newly qualified in 1944 was 2122, and in 1945 was 2277. Since 1940 there have been 4258 temporary registrations in the colonial and foreign section of the register which are outside the stream of normal demand and supply; there were 322 such registrations in 1945. This form of registration ceased on Feb. 24, when temporary colonial registrations totalled 827, and temporary foreign registrations 3553.

Dr. F. M. Madwar, director of the malaria section of the Egyptian ministry of health, will speak at the Egyptian Institute, 4, Chesterfield Gardens, London, W.1, on Thursday, Sept. 5, at 6.30 P.M. His subject will be the Eradication of *Anopheles gambiæ* from Egypt.

Services Abroad

INDIAN MEDICAL SERVICE

ALL further recruitment to the Indian Medical Service has now ceased, and the government of India has made no final decision about the disposal of serving officers.

Recruitment to the Indian Army Medical Corps (I.A.M.C.) which is purely a military medical corps, will be *limited to Indian subjects, and will probably* be restricted to candidates holding a qualification recognised for registration under schedules 1 and 2 of the Medical Council of India. At present all officers serving in the I.A.M.C. hold temporary commissions.

WOMEN'S MEDICAL SERVICE FOR INDIA

Admission to the service is by selection in India and England. Appointment is open to English and Indian qualified women. Vacancies are few—usually only 3 or 4 in each year—and there is little recruitment from England. There is also a training reserve of qualified women recruited from Indian universities. Since the outbreak of war no members of the training reserve have been sent to England for postgraduate study, and leave out of India has also been restricted. Vacancies in the service are being filled by doctors in India as need arises, but *applications from Europeans holding higher medical* qualifications will be welcomed. The post of medical adviser in the United Kingdom is now held by Dr. Charlotte Houlton, C.B.E., S.P.G. House, 15, Tufton Street, London, S.W.1.

COLONIAL MEDICAL SERVICE

Vacancies in the Colonial Medical Service occur most often in tropical Africa and Malaya. Medical officers are required, to replace normal wastage and to provide staff for expansion; they must be British subjects and hold a medical qualification registrable in the United Kingdom. Candidates must have been born on or after Jan. 1, 1905, but, in addition, special contract terms are available for men up to the age of 45 or for younger candidates who would prefer to serve in the Colonies for a term of years rather than for their whole career.

Medical officers are appointed in the first instance for general service. There are opportunities for field investigation, and posts are filled from within the service for work in special branches of medicine and surgery and in public health. Medical research departments exist in the larger Colonies. Specialist appointments are usually reserved for officers holding higher appointments who have shown outstanding merit in a particular branch of medical practice. Opportunities to gain these qualifications will be made available whenever possible, and selected candidates may be required to attend a course of instruction in tropical medicine and hygiene before proceeding overseas, or else to attend such a course during their first leave period. Vacancies will occur in greater numbers in future for women with experience in gynæcological and maternity work, school public health, and child welfare.

Various Government medical departments employ about 700 European medical officers, including some 30 women, and about 1200 locally appointed medical officers. Depending upon the territory, such diseases as malaria, yaws, leprosy, sleeping sickness, plague, yellow fever, cholera, and other conditions associated with the tropics are encountered in addition to the usual *diseases experienced in any medical practice. An officer* in the Colonial Medical Service has special opportunities for the practice of preventive medicine, as well as opportunities for teaching and research.

The medical and health services will be considerably expanded in order to fulfil the schemes for public-health *development already planned. Full particulars of terms* and conditions of service may be obtained from the Director of Recruitment, Colonial Office, 15, Victoria Street, London, S.W.1.

SOUTHERN RHODESIAN MEDICAL SERVICE

The Government of Southern Rhodesia maintains a medical and public-health service with an establishment of 18 whole-time administrative specialist or public-health officers and 43 *Government medical officers.*

Rates of pay for the whole-time officers are:

	Annual Salary
Medical Director	£1800
2 Assistant Health Officers	£1350–£50–£15
School Medical Officer (man)	
Field Officer	
2 Radiologists	
2 Directors of Laboratories	
Government Pathologist	
Government Psychiatrist	
Medical Superintendent Mental Hospital	
Medical Superintendent Leprosy Hospital	
Assistant Medical Superintendent Mental Hospital	£1000–£50–£11
School Medical Officer (man)	£850–£30–£1
2 School Medical Officers (women)	

Government Medical Officers are graded as follows:

2 Senior Government Medical Officers	£1000–£50–£11
41 Government Medical Officers	£600–£25–£7

Whole-time medical officers and the two s Government medical officers are not permitted pri practice but are allowed consultant practice. G ment medical officers, except those stationed at Sal or Bulawayo, are allowed private practice, the val which varies from £100 per annum upwards, accor to the station. The duties of Government *officers include supervision of the* 18 Gov hospitals and numerous native clinics, and attendan on police, boarders in Government schools, and prison They also undertake medico-legal work and public-heal duties. Leave may be granted at the rate of one-eig of service, and may be taken in periods not exceedi 184 days at a time. Study leave may also be

After two years' service medical officers under t age of 45 can be appointed to the fixed establishme and contribute to a pensions' scheme. The retiring a is 60. On appointment Government medical officers usually stationed at Salisbury or Bulawayo, where t are not permitted private practice but are paid an a ance of £130 per annum in compensation. They are usu required to do relieving duties at various outstations a permanent vacancy occurs. Appointments in Gr Britain to the service are made by the High Commiss for Southern Rhodesia, Rhodesia House, 429, Str London, W.C.2, who will supply further details on requ

SUDAN MEDICAL SERVICE

The Sudan Medical Service aims at providing a co plete Health Service for the Sudanese people, Government officials, and for the Sudan Defence Fo The area of the Anglo-Egyptian Sudan is about a mi square miles—about the same size as British In and the total population is probably still less t 8,000,000. In accordance with the terms of the A Egyptian Agreement of January, 1899, the country under the joint protection of Great Britain and Egypt, its connexion with the British Government is through British Ambassador in Cairo and the British Foreign O

The country is embarking on a new period of deve ment in the educational, political, and economic sph and it is the policy of the Government that Suda shall have the opportunity of filling all Governm posts for which they may be fitted by person ability, and training. It is therefore important that *appointed British officials should be sympathetic* t policy, and should be ready and willing to play their *in assisting towards its achievement.*

The personnel of the Medical Service on the British consists at present of about 44 doctors, 32 nurses, some public-health inspectors and laboratory and *technicians.* On the Sudanese side there are more 80 doctors—trained at the Kitchener School of Med in Khartoum—some of whom have had postgrad experience in London, as well as public-health of and sanitary overseers, medical assistants in charg dispensaries, and a large number of hospital order *nurses, and midwives.*

The headquarters of the service are in Khartou and here, and in the adjacent town of Omdurman the central hospitals and specialist services, the Kitch School of Medicine, the Stack Laboratories, and wives' and Nurses' Training Schools. The project an entirely new hospital of over 400 beds for Khart has been initiated, and construction work will be star as soon as circumstances permit. Outside Khar the country is divided into seven main provinces, and l Institute of Public Health and Hygiene also courses for the diploma. conforming to the new ations; the next course begins in September.

YCHOLOGICAL MEDICINE.—Courses are at present in ance at many of the universities which used to grant loma in psychological medicine. The Royal College hysicians have recommended a five-year training psychiatric specialists, and the English Conjoint d has already issued new regulations for the diploma, h extend the course considerably. After June, 1947, idates will have to show that they have completed ast two and a half years of special study, including nonths' daily attendance in a recognised neurological rtment. eighteen months' whole-time experience in cognised institution for mental diseases, and six ths' whole-time study of child psychiatry and mental iency. These, moreover, are interim arrangements, ling the inception of a full five-years' curriculum udies and clinical training.

he universities of London, Durham, Leeds. Man- ter, Edinburgh, Belfast, Dublin (Trinity College), and (National University). and the English and Conjoint Boards normally offer diplomas in psycho- al medicine. The courses for the diplomas of ham, Leeds, and Belfast universities are at present ended. and at Edinburgh future courses will depend he demand and on the staff available.

he usual course for the D.P.M. is being held at dsley Hospital from June to December. In June July lectures and practical instruction are given on anatomy and physiology of the nervous system. and psychology, covering part I of the D.P.M. syllabus. m September to November inclusive the lectures h clinical demonstrations cover all aspects of psychiatry mental deficiency; and clinical instruction in psychi- y and neurology complying with the requirements of examining bodies is arranged. Lectures and demon- ations are also given on neuropathology. Clinical ruction is given at the Maudsley Hospital and is ilable also at St. Ebba's Hospital. Sutton Emergency spital, Banstead Hospital, and other London County ncil mental hospitals and institutions for mental iciency. Information can be obtained from the Dean, udsley Hospital Medical School, Denmark Hill, S.E.5.

he Tavistock Clinic has completed its move to manent quarters at 2. Beaumont Street. London. 1. The psychotherapy of both adults and children as patients, based on analytical concepts, which has racterised the clinic's activities in the past, is being eloped, and particular attention is being given to up psychotherapy. In addition to therapeutic work. clinic and the associated Tavistock Institute of man Relations are studying techniques in preventive chiatry. These include mothers' discussion groups, ection techniques. and techniques for improving erpersonal relations in school and industry and ilar psychological and sociological procedures.

The educational programme includes courses for chologists and social workers as well as doctors. e course for psychiatrists specialising in child psychi- y, arranged jointly with the Provisional National uncil for Mental Health, will be continued. Postgradu- instruction for doctors wishing to acquire experience the approach to psychotherapy in adult cases of rosis and allied behaviour disorders will be started October. 1946. The number of students accepted will limited and admission to the course will be by selection. me lectures in this course may be open to a wider dical audience. A weekly seminar in psychological dicine for general practitioners will also be held roughout the winter session if there is sufficient mand. Inquiries about training activities and fees ould be addressed to the Director of Studies, Tavistock inic, 2, Beaumont Street, London, W.1.

The Institute of Psycho-Analysis. 96. Gloucester ace. London. W.1. provides training in psycho-analytic eory and technique. The course is part-time and lasts out four years. It includes a personal analysis. atten- nce at lectures and seminars (held in the evenings), d clinical work done under supervision. Students are quired to obtain general psychiatric experience at other nics and hospitals. since the Institute does not set out teach all aspects of psychiatry. Completion of the course to the satisfaction of the training committee qualifies the student for election as an Associate Member of the British Psycho-Analytic Society. In addition to this main course designed for those intending to specialise, the Institute gives briefer courses from time to time on the application of the principles of psycho-analysis to medical problems. These are advertised in the medical press.

TROPICAL MEDICINE.—A diploma in tropical medicine is required by those seeking appointments in the tropics. Diplomas are granted by the English Conjoint Board: by Liverpool University jointly with the Liverpool School of Tropical Medicine, and by Edinburgh University. Courses are being held at Liverpool and Edinburgh. The London School of Hygiene and Tropical Medicine gives courses for doctors taking the Conjoint diploma. It is open to all qualified practitioners, but those not holding a qualification registrable in England should consult the secretary of the Conjoint Board, 8, Queen Square. London, W.C.1. The number of vacancies is limited, and those wishing to take the course should apply early to the Registrar, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1.

Postgraduate Courses in Scotland

The EDINBURGH POSTGRADUATE BOARD FOR MEDICINE, which represents the university, and the Royal College of Physicians and the Royal College of Surgeons of Edinburgh, arranges programmes of graduate studies. Five general refresher courses, for general practitioners, each lasting a fortnight. have already been held. and two more are arranged for the long vacation. These are expected to run at regular intervals during the coming year: they are well attended. and not all those applying can find places. Classes in postgraduate surgery. lasting 10 weeks. have also been held, and some 280 surgeons have attended, but it is not intended to hold further short courses of this kind. Instead there will be two courses, each lasting 5 months. one beginning in October of this year and the next in March, 1947. Two courses in internal medicine, each lasting 10 weeks, have been held during the current session and have been attended by about 140 doctors. Each term the board arranges five lectures on subjects of wide biological interest: those for the forthcoming session are not yet announced, but those in the past session dealt with such subjects as the biology of death: uranium and neutrons; form and function; chemotherapy toxicity and chemical competition: and virus developments. Courses in midwifery, gynæcology. and pædiatrics, lasting a fortnight, have been arranged for general practitioners and have proved very popular.

The large size of the undergraduate school makes it difficult to provide detailed clinical teaching for postgraduates, but the board is considering ways of improving the position. The university and the Royal College of Surgeons have opened their libraries to those taking the longer postgraduate courses. The board has helped the dean of the faculty of medicine in placing candidates for posts under the demobilised medical officers scheme. Information may be had from the Acting Director of Studies. Postgraduate Board for Medicine, University New Buildings. Edinburgh.

GLASGOW UNIVERSITY has arranged for general practitioners a postgraduate course in obstetrics and pædiatrics, beginning in September and lasting a fortnight; and also general courses. also lasting a fortnight. to be arranged during the session according to demand. A course of lectures and clinical demonstrations on recent advances in internal medicine. lasting 7–8 weeks. will be held from October to December. and a similar course in surgery will run concurrently with it. Courses in diagnostic and therapeutic radiology. and probably in medical pædiatrics and some other specialties. will be arranged. Inquiries should be addressed to the Convenor, Committee on Postgraduate Medical Education. Glasgow University.

THE Home Secretary has appointed Dr. R. A. Young a member of the advisory committee on the administration of the Cruelty to Animals Act in place of the late Sir Farquhar Buzzard.

Postgraduate Education

In London

The University of London is expanding its provisions for postgraduate studies and has established the BRITISH POSTGRADUATE MEDICAL FEDERATION to develop and coördinate the educational facilities in London. Beginning with the university's postgraduate departments in general medicine, general surgery, obstetrics, and pathology at the Postgraduate Medical School and Hammersmith Hospital, the federation will include in the coming year the Institute of Child Health at Great Ormond Street, where a professorship has already been established, and the Institutes of Neurology at Queen's Square, of Laryngology and Otology at Gray's Inn Road and Golden Square, and an Ophthalmic Institute at Moorfields and the Central London Ophthalmic Hospitals. It is hoped to establish other institutes for teaching and research: in dermatology with the help of St. John's Hospital for Diseases of the Skin, in diseases of the chest with the Brompton Hospital, in genito-urinary diseases with St. Peter's and St. Paul's, in cardiology with the Heart Hospital, and in orthopædic surgery with the Royal National Orthopædic Hospital. Until the teaching schools at these hospitals can be staffed and equipped as university departments, they will collaborate with the federation and its constituent institutes.

The Maudsley Hospital already carries a university school, which will probably soon be brought into the federation as the Institute of Psychiatry.

The university has thus been able to make a beginning towards providing postgraduate education and training for specialists of an approved standard in medicine, surgery, and the major special branches, and graduates should apply to the Central Office of the Federation at 2, Gordon Square, London, W.C.1 (Tel.: Museum 6616), for details of opportunities and courses.

The central office plans to collect details of postgraduate facilities throughout the country and will shortly be able to provide up-to-date information of the opportunities available in London and elsewhere. The director and staff of the central office are always glad to advise graduates, who should arrange appointments in advance in order to avoid delays.

The accommodation at the institutes and associated schools and hospitals of the federation will not be sufficient for some time to meet the demands, especially in general medicine, general surgery, and obstetrics, so there must at first be some selection for the available places. Preference will be given during the coming year to ex-Service applicants and to graduates sponsored and recommended by their universities and governments. At all the institutes and schools associated with the federation courses of instruction and clinical work in wards and outpatient departments will be arranged, and the usual hospital appointments for clinical assistants, house-physicians and house-surgeons, and registrars will be available for the training of specialists.

At the undergraduate medical schools and teaching hospitals the usual hospital appointments provide postgraduate training of a high standard in all branches of medicine, but they are limited in number and vacancies are usually filled by their own graduates. Some of the medical schools arrange revision courses from time to time, suitable for candidates for higher degrees and diplomas, and a few places in these courses are available for selected graduates from other schools and from overseas.

For graduates who cannot be accommodated in the schools of the federation, or who do not require organised instruction and training, there are a number of other general and special hospitals where opportunities are available for attendance in wards and outpatient departments, and where short courses of lectures are arranged from time to time to meet temporary requirements, such as the preparation for specific examinations. The Fellowship of Medicine (see below) arrange courses of lectures of this kind, as need arises.

The central office of the federation will continue in the coming year to arrange intensive refresher courses lasting a fortnight for general practitioners released from the Forces, and as the demand from the ex-Service titioners diminishes, similar courses will be pr for other general practitioners, including those w under the National Health Insurance scheme. T courses will be held at voluntary and municipal ho other than those engaged in undergraduate tea and will be advertised in the medical press. the National Health Service is instituted other ty postgraduate education will be offered, to enable p practitioners to keep in closer touch with educat centres and teaching hospitals. Transitional ar ments in the coming year should give valuable exp for the future.

* * *

The FELLOWSHIP OF POSTGRADUATE MEDICINE, has a bureau at 1, Wimpole Street, London, W.1, p general information on postgraduate work, ar at various hospitals, courses of instruction which be classed under two main headings:

1. Weekend courses, occupying the whole of a S and Sunday, for general practitioners. These are in various general and special hospitals in such as general medicine and surgery, obstetrics and g cology, ear, nose, and throat conditions, ophthalm children's diseases, and rheumatic diseases.
2. Short clinical courses for candidates for the M.R.C.P. F.R.C.S. (final) given shortly before the examination

Twice a year revision courses in anæsthetics arranged in Oxford and in London; also lecture-dem strations for primary F.R.C.S. candidates, and occas courses for M.R.C.O.G. candidates and D.C.H. candid

Other courses are arranged from time to tim proctology and urology. It is hoped to add to t number and variety of courses as facilities permit.

Some London Courses

SURGERY.—The Royal College of Surgeons arranged a course of surgical lectures and demonstra to be delivered at the college in Lincoln's Inn F London, W.C.2, at 5 P.M. daily, between Oct. 21 Nov. 6. A course of lectures in anatomy, applied phy logy, and pathology will be given between Sept. 2 Oct. 18. Fellows and members of the college will admitted without charge to either series of lectures must apply for a card of admission. Similar cour lectures will be held in the early part of next These courses of lectures must not be regarded as specially arranged for the final and primary fell examinations: but they are so planned as to be h to candidates, and also to practising surgeons, by d with the practical application of recent advance

The college maintains a library, museums laboratories for the use of medical graduates fro parts of the world. Fellows and members enjoy facilities by right, but they have also been made on suitable introduction, to other graduates of med and to undergraduates.

The Arris and Gale and the Hunterian Lectures p opportunities for the presentation of original w anatomy, physiology, pathology, and surgery. college awards several prizes for meritorious w well as many fellowships for those who desire to en in practical work in the museum and laboratories devote some time to research.

PUBLIC HEALTH.—Most university courses in p health have now been revived. Before the war a was granted by all the British universities except Ox Cambridge, and Sheffield. New requirements by G.M.C. have caused universities to revise the cour this examination, which is now taken in two parts first leading to a certificate in public health (C.P. taken after three months' work, and the second to diploma. The London School of Hygiene and Trop Medicine offers a course beginning in October and la nine months, and designed primarily for those inte to seek posts as medical officers of health. All vaca for the full course for the diploma have been filled. there is a waiting-list, but in view of the developmen and subdivision of medical work in the public-hea service, some places in the course for the certific have been reserved for doctors who intend to under public-health work other than that of a M.O.H.

cation, and the B.M.S.A. has organised several iange schemes, mostly reciprocal, with such countries Sweden, Denmark, Czechoslovakia, and Switzerland. eral parties of foreign students have already arrived his country, and many students from Great Britain spending their summer vacations abroad, studying lical methods and at the same time having good days. An appeal for medical books for Czech students ught extremely good results.

he same peripatetic tendency has been seen at home year. A clinical conference, organised by the associa- i in conjunction with the medical students' represen- ve council of the University of Durham, was held at vcastle-on-Tyne in July. It was attended by repre- tatives from the northern region of the B.M.S.A., l observers from Scotland and Ireland were also sent. This conference lasted four days and included ical instruction and lectures in the Royal Victoria irmary as well as several visits to other institutions l places of interest, notably to two miners' reablement tres. Apart from formal work, the conference e ample opportunity for the various delegates to et each other and to exchange information and nions.

t Easter Mr. J. J. A. Reid, B.SC., the president of association, visited the Sanatorium des Étudiants France, near Grenoble, and studied the French dents' anti-tuberculosis scheme, which is very good. has prepared a report to be considered by the B.M.S.A. l the National Union of Students, in the hope that ne similar plan may be possible in Great Britain. anwhile, recent advances in student health work being investigated.

The Glasgow branch of the association started a blood- nor campaign with sessions at times convenient to idents, and obtained 180 pints of blood for the local nsfusion service, which needed it badly. This scheme to be expanded in the next few months. This branch s also established, after investigating the point with Ministries concerned, that clinical clerks are not ble to health and unemployment insurance contribu- ns—an important point, since students had been made pay contributions while clerking in some Glasgow and strict hospitals. The Durham branch has produced report on the question of compulsory and non- mpulsory lectures.

The film secretary of the association has reported on e position of medical films in the past and present, d their probable place in future teaching. Four edical schools are now producing their own films.

The use of wall-newspapers is spreading in many hools, and a panel of lecturers is being prepared for e use of medical-student societies. The report on the st of medical education is to be published this year. Meetings, visits, and discussions have been arranged in e various regions, and the B.M.S.A. is in an even better sition to help and serve the needs of medical students an it was a year ago.

FECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED AUGUST 17

Notifications.—Smallpox, 0; scarlet fever, 690; ooping-cough, 2097; diphtheria, 251; paratyphoid, typhoid, 53 (19 in Cardiganshire); measles (exclud- g rubella), 2712; pneumonia (primary or influenzal), 0; cerebrospinal fever, 47; poliomyelitis, 33; polio- cephalitis, 1; encephalitis lethargica, 1; dysentery, ; puerperal pyrexia, 136; ophthalmia neonatorum. No case of cholera, plague, or typhus was notified ring the week.

Deaths.—In 126 great towns there were 4 (0) deaths om enteric fever, 1 (0) from scarlet fever, 6 (3) from easles, 5 (0) from whooping-cough, 3 (0) from diph- eria, 39 (2) from diarrhœa and enteritis under two ars, and 6 (0) from influenza. The figures in parentheses e those for London itself.

The number of stillbirths notified during the week was 4 (corresponding to a rate of 31 per thousand total rths), including 43 in London.

TYPHOID IN WALES.—Up to August 26 there have been further secondary cases of typhoid in Aberystwyth d district, making a total of 134, with 4 deaths.

In England Now

A Running Commentary by Peripatetic Correspondents

I ASKED our professor of anatomy what his views were on the reform of the medical curriculum in his own subject. He agreed that much dead wood should be cut out of the large forest of anatomical detail, but I found that he was bent on planting several new saplings, such as genetics, embryology, neuro-anatomy, and histology in his domain. I remarked that the last two were often taught by physiologists, but he sniffed and said that they were better taught by anatomists. I then changed my ground. "Do you really think it necessary for the medical student who is to become a general practitioner to dissect the whole human body?" I asked. He looked at me as if I had suddenly taken leave of my senses. "Of course," he replied, "how else can he obtain the necessary knowledge for the practice of his profession?" "As a matter of fact he does not now obtain that knowledge," I answered, "or if he obtains it he does not retain it." "What do you mean by that?" he asked almost angrily. "Simply this," I said, "that the medical student by the time he is ready to go in for his final examination in surgery has, as a rule, forgotten most of the important data which he was supposed to learn by dissection." The professor doubted this, so I invited him to the next surgical anatomy examination for the qualifying degree in surgery to hear and see for himself the abysmal degree of ignorance of anatomy revealed there. I doubt if he will come, and if he came I doubt whether he would draw from the evidence the same conclusions which I would draw.

Every examiner in surgery will probably agree with me that most students up for their final do not know the basic facts of anatomy. The only way in which these facts can be taught is by continuous repetition. Such a method of teaching is dull for the teacher, and it is quite understandable that many may lay undue stress on the (to them) more interesting problems of embryology and neurology which should really be dealt with in an honours class.

I doubt very much if the dissection of the whole body should be compulsory for the ordinary qualifying examination. Certainly the arm and the lower limb should be dissected, but if the student has a sound knowledge of the skeleton he should acquire sufficient knowledge of the abdomen, chest, and cranium at demonstrations in the dissecting-room and the post-mortem room. Anyway, I prophesy that circumstances will soon compel the limitation of anatomical dissection. When the new social security and health Bills become law where will the anatomical subjects come from?

* * *

Why my thoughts went back to that ancient half-forgotten figure of a physician, Verrily Namlos, I do not know. But I had been dipping into a new History of Medicine which someone had given me, and I was perhaps keenly conscious of the great cloud of witnesses whose names adorn our profession. He was not highly thought of in his own day. His was one of the obscurer medical schools—St. Gallipot's, then almost hidden in a retiring old-world corner of the City, on the south-west side of Galen's Gardens. He wrote little. Comparatively early in his career he ceased to speak at official medical meetings, save on the rarest of occasions. Although he became a fellow of the College, he never held high office, and when he died the president was hard put to find anything original to say about him in the annual obituary oration.

I once heard him claimed as probably the greatest medical educationist of all time—and that years ago, before the modern debasement of the currency of words. Yet nowadays who remembers him, save as a name to which there clings a faint aroma of distinction, elusive and ill defined? Even the little biography, put together some years after his death by a few of his old students, is hardly ever read; the copies which, for curiosity, I have hunted out in various medical libraries were covered with the dust of years. My own precious copy I picked up, long before the war, in the sixpenny box at Mustie's bookshop in Physicians' Walk, its brown calf covers tattered and loose at the hinges, its old-fashioned pages

Special Articles

STRASBOURG AND MANCHESTER

A PROPOSED LIAISON

ROBERT PLATT
M.D. Sheff., F.R.C.P.
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF MANCHESTER

THE idea of a close liaison between the universities of Manchester and Strasbourg originated from some of the Manchester staff and students, and a party of students has already made a visit to the proposed sister university. The University of Strasbourg then invited Manchester to send three delegates from their staff, and on July 4 the professors of French, cryptogamic botany, and medicine (representing three major faculties) set off from Ringway airport.

We were in Paris in 2½ hours where we were entertained to lunch by representatives of the French Ministry of Education. We travelled to Strasbourg the same evening, and during our stay there worked independently, each one being shown round and entertained by members of his own faculty.

The medical school is accommodated in a series of institutes, in close touch with the Hôpital Civil; in fact, the various departments of anatomy, physiology, and pathology, though in separate buildings, are in the same grounds as the clinics of the hospital. There are 2200 beds and about 800 medical students, and it would be no exaggeration to say that equivalent accommodation does not exist at any British medical school. Strasbourg is recovering rapidly from damage by air-raids and disorganisation due to German occupation, and most departments are already in full action. One of the biggest difficulties at present is the lack of the British and American literature of the war years. This is being gradually made up, partly by the use of microfilms; but reprints of important British papers would be very welcome.

We were there primarily to explore the possibilities of exchange of students or postgraduates, and to decide whether it was possible to arrange visits and lectures by members of staff. It was therefore important to find out in what respect the medical curriculum differed from our own.

The normal medical course is six years and is much the same as ours, with two major exceptions. Students do elementary clinical work from the first year onwards, in addition to their other studies; and in the fourth or fifth year some of the students—usually not more than 10—are selected by examination to become interns. These then follow a different course and do not qualify until they have done another four years while actually resident in the hospital. During this time they change at intervals from one clinic to another (medical, surgical, pædiatric, &c.).

This selection of the élite for a special course is highly desirable, though possibly the selection is not made at the best time. I would prefer to see in our own universities an honours school of medicine in which selected students would learn more organic chemistry, would spend an extra year at least in physiology, and pursue a more advanced course of study with resident experience in clinical subjects. This would be one solution of the old conflict between the desire to give the best students a really intelligent education, and the need to provide a basic technical training for the average. Such subjects as the history of medicine could be introduced into the honours course without it being necessary to answer the question "What use are they?"

An interesting experiment at Strasbourg is the appointment, recently made, of a professor of biology in the medical faculty, whose course of instruction will replace the usually ill-adapted studies in botany and zoo shared by medical and science students. The cl are organised on the Continental system with a director for every clinic or service, each of which comprise as many as 250 beds. On such a unit there be perhaps three assistants who are experienced ph cians or surgeons allowed to engage in private prac There is also a chef de clinique who would corresp with our resident medical officer. He has an assis and the remaining residents are the intern students alr referred to. Each clinic has its laboratories and labo workers, and full facilities such as X-ray departm electrocardiograph, or operating-theatres as necessar

It is easy to see advantages and disadvantag both our system and theirs. Owing to the differ in the medical course there are difficulties in arra exchanges between the two universities, but it is l that, at the very least, vacation visits can be arra during the summer months. We hope shortly to h a return visit from our colleagues at Strasbourg, wh such questions can be further discussed. Often in the past lip-service has been given to the notion of a cl liaison between the cultural interests of Britain and th Continent, but this beginning seems likely to lead t something more concrete, a true bond between th universities, sponsored and encouraged by the authoriti on both sides.

Throughout our stay in Strasbourg we were the gues of the university, and in our many intimate discussio often in not too good French or English—we caug glimpses of what some of our colleagues had been throu Several had been in concentration-camps, many h relatives who had never returned. This brief note giv no hint of the truly fraternal feeling evident during t visit. The meeting was like a reunion of members of a family whom long years of war had separated.

BRITISH MEDICAL STUDENTS' ASSOCIATIO

THE British Medical Students' Association, f during the recent war, has extended its activities co siderably in the first post-war year, both in the natio and in the international fields.

Thanks to relaxation in paper control, the associati has been able to publish a national journal for medi students this year. The first number, a special inte national edition, is already on sale, and contains a account of the new world student organisation whi is now being born in Prague; the international secretar of the association has been several times to Prague t help with the antenatal care of this hopeful child. H report on some medical and social aspects of Czech slovakia also appears in the first issue of the journ The second number will be published in October, an the journal will afterwards appear quarterly, and wi be available in almost all the universities and medi schools of Great Britain and Ireland. It will cove wide range of technical and non-technical subjects, and will contain contributions from both students or eminent seniors in the profession. This journal, it hoped, will bring students from all parts of the countr into touch with one another.

The National Health Service Bill presented seve problems for the B.M.S.A. It was clearly the duty of the association to try to discover the opinions of th medical students of the country on this important issu but to have convened a special representative meetin in London to discuss it would have been too expensiv for the constituent organisations. A questionnaire wa therefore circulated to every medical school, includin the few which are not members of the B.M.S.A., and wa answered by a satisfactory proportion of student Results were analysed by the British Institute of Publ Opinion, to whom the association is also indebted f advice on the questions to be asked. The final results are to be drawn up in the form of a report which will be presented to the Minister of Health.

Student exchange with foreign countries has long been recognised as a valuable part of teaching and

Notes and News

THE CAPITATION FEE

LAST Saturday the Ministry of Health announced that capitation fee payable to doctors for each insured person their lists under the National Health Insurance Acts has n increased from 10*s*. 6*d*. to 12*s*. 6*d*. with effect from Jan. 1, 6. Accumulated back payments will be made in the near ure—if possible at the end of September.

he extra cost of the new fee during the period between . 1, 1946, and April 1, 1948, when the National Health vice will come into operation, will be about £4,500,000. cussions on the subject between the Ministry and the urance Acts Committee were summarised in our issue of gust 3 (p. 166).

THE STUDENTS' JOURNAL

HE development, in a few years, of the British Medical idents' Association from a relatively sluggish section of National Union of Students has been almost as remarkable the metamorphosis of a caterpillar. This year the associa- n has published the first issue of the *British Medical idents' Journal*, an international number, well written and duced; and illustrated by good photographs. It tells the story the first World Student Congress to be held since the war.

"On the 17th November, 1939, the Charles University in Prague was closed by the German authorities, nine heads of he students' organisation were shot, and a large proportion of the male student population was thereafter thrown into concentration camps or sent to forced labour inside Germany."

fugee students and British students decided together that day should be remembered as International Students' y; and the first celebration of it was held in Prague last ar. The great welcome given to students of all countries o went to this gathering and the plans made for their cussions and for their entertainment evidently moved eply those who attended, and must have done much to ablish that sense of fellowship on which the peoples of the rld must rely for a safe and constructive future.

This journal makes impressive reading.

PATENT-LAW REFORM

THE Joint Chemical Committee on Patents submitted a emorandum to the Board of Trade Patents Committee in ptember, 1944; some aspects of the views therein contained, pecially in relation to chemical manufacture, the exploitation medical discoveries, and the preservation of secrecy, were cussed here at the time (*Lancet*, 1944, ii, 542). In June of is year the Joint Committee produced a second memoran- m, covering wider considerations of patent-law reform. e two documents have now been reprinted in a single volume blished by the Association of British Chemical Manu- cturers (3*s*. post free). Some of the recommendations have eady found favour and are included in the *Second Interim* port of the Departmental Committee (Cmd. 6789). Patent r is repulsively technical, but those who understand these ysteries will find much to interest them in the new publication.

To take a casual instance of the complication of the law, the kward interpretation of words like "manner of manu- cture" has been illustrated by the recent discovery of werful insecticides. Hitherto little more than chemical riosities, certain substances have been found to possess eat industrial significance. Being *new*, the discoveries ould confer patentable "subject matter" in their novel dustrial application as insecticides. The application is the anufacture, but, since the substance was already known, the anufacture lacks novelty and is unpatentable. Killing sects is not manufacture. The only patent cover obtainable for some novel composition containing the active substance in other words, for the mixing of the substance with a luent. So what is intrinsically unpatentable becomes tentable by the addition of a non-inventive stage. The anufacture would be patentable, if novel; the mixing of some mmon diluent is relied upon to provide the necessary velty. In Holland and the United States, as in pre-war ermany, it appears, the use of substances as insecticides has en patentable.

Two matters in the memorandum may be mentioned as of terest to the medical profession. Under section 38A of the tents Act, compulsory licences may be granted in respect patents relating to food and medicine. No great use has en made of the powers in the section, though they may have indirectly inclined pharmaceutical manufacturers to grant licences by voluntary agreement. The Joint Committee observe that difficulty has occurred in interpreting section 38A because the section deals both with chemical inventions and also with inventions relating to food and medicine. They suggest that when the Act is rewritten the section should be split and the two classes of invention separately treated.

Secondly they note that the royal prerogative reserved to the Crown by section 97 has lately been exercised to refuse a patent concerning a device for calculating the "safe periods" for marital intercourse, and that under section 75 patents have been refused for contraceptive chemicals and devices. The Act at present embodies this jurisdiction to refuse recognition to patents "contrary to law or morality." The Joint Committee think that the words "or morality" might be deleted from the statute. Such inventions, they say, may be useful contributions to medical knowledge and it is difficult today to regard them as necessarily contrary to public morals. "Many patented inventions are capable of abuse with much more devastating results, and we urge that patent specifications are a form of literature which should be regarded as 'technical' equally with the *Lancet* and the *British Medical Journal*."

CENSUS OF HOSPITAL CASES

THE Glasgow Bureau of Health and Sickness Records, of which Prof. T. Ferguson is chairman, is undertaking a census of all hospital-treated sickness occurring among people domiciled in the county of Stirling (including the "large burghs" of Falkirk and Stirling) during the year beginning on Oct. 1. The intention is to cover all kinds of sickness, including mental illness, and to collect information about Stirlingshire cases not merely from hospitals within their area but also from city and other hospitals to which patients in the county commonly go for treatment. The aim is to get a fairly complete picture of the nature and extent of hospital-treated sickness in what is a fairly typical and representative Scottish county area. The information thus obtained may well point the way to useful administrative action.

BRITISH BOOKS ON SHOW IN SWITZERLAND

AN exhibition of British books, old and modern, general and technical, will be opened in Berne on Sept. 3, and will later be shown in Bâle, Zürich, Geneva, and Lausanne. The first exhibit is an original leaf of the *Chronicles of England*, printed by Caxton in 1480. A separate section will be devoted to the periodical press. The display, devised by the British Council, follows four months after an exhibition of Swiss books in London.

INVALID AND VOIDABLE MARRIAGES

"MARRIAGES are also void in the case of certain diseases. Information about these should be sought from a reliable medical man." Reading this statement in a book, a clergyman asks us for further facts.

There are certain requisites for a valid marriage, and if any of these is absent the marriage is void ab initio: (1) both parties must be over sixteen years of age; (2) both parties must be mentally capable of understanding the nature of the contract; (3) the parties must not be within the prohibited degrees of relationship; (4) both parties must freely consent, consent obtained by duress or force being void, but not consent obtained by fraud; (5) there must not be an already subsisting marriage which is valid; and (6) the ceremony must be in proper form.

It will be seen that there is no provision for invalidity on the grounds of disease, apart from (2) above. There are certain grounds upon which a marriage is *voidable*, but this does not mean that the marriage was originally unlawful, and indeed in all these cases it is entirely at the option of the party aggrieved whether the marriage is avoided or not. Even in the case of venereal disease the petitioner must satisfy the court that he or she was unaware of it at the time of the marriage and refused intercourse on learning of it (Matrimonial Causes Act, 1937). The clear implication is therefore that such disease is no bar to a valid marriage.

The grounds of voidability are (1) incapacity due to incurable physical mental or moral disability; (2) wilful refusal to consummate; (3) unsound mind or mental deficiency of one party of which the other was ignorant at the time of the marriage; (4) communicable venereal disease subject to the proviso above mentioned; (5) pregnancy of the respondent by another man at the time of marriage. In all these cases the marriage is valid until avoided, and in the last three petition must be made within a year of marriage.

badly foxed. You must get hold of a copy if you would see what he made of medical teaching; for there is a quality about it which defies summary, or even quotation. It is a book to be read as a whole, to be marked, learned, and inwardly digested. But I *cannot forbear* to pass on (as a kind of aperitif) an illuminating confession made in later life to one of his biographers. In my view it can stand as the perfect background to the man.

At the outset of his career as a physician, on his appointment to the staff of his teaching hospital, Namlos took a tramping holiday, alone, in the Lakes, with the purpose of getting straight in his mind what medical teaching and education really meant. He came to realise that there were three things he must at all costs avoid—three "temptations of the Devil," as he put it. The first was to teach medicine by rote, reducing it to an easily memorised system of tips, classifications, short cuts, synopses, unrelated facts. To do this would doubtless bring him popularity as a "good teacher," and there would be plenty to join his classes for such *examination drill.* He saw that to yield to this, the most insidious of temptations for the medical teacher, would be to offer his students stones instead of bread. He enjoyed contact with students, and a popular following would have given him much pleasure; but it was not in his character *to seek popularity, and he never achieved it.*

Of much less appeal to a man of his type was the temptation of trying to build up a reputation of being gifted with mysterious clinical powers. Some teachers hoodwink themselves, and for a time their students, into the belief that there are secrets of medicine which they, and only they, possess. They almost come to feel that, wizards themselves, they may graciously pass on the magic tricks to their initiates. Namlos could only chuckle at the thought of his ever joining such a magicians' circle; he would be found out at once, by the greenest novice among his clinical clerks.

He admits that for a brief period Satan nearly got under his guard with a third temptation, by sketching a picture of the rôle of the great man in medicine—vistas of leadership and opportunity, of academic and public honours, *which in their turn would lead to ever-widening* influence among the great and powerful. So, through him, might medicine become greater, and his own name be remembered down the ages as a benefactor of mankind. A devilishly appealing picture, indeed! But as he came down the hillside, one darkening afternoon, to the little farm where he was staying, and to the simple rugged souls with whom he was at home, he knew that for him this sort of activity and achievement would be but vanity. One of Sydenham's *Observationes Medicæ* came to his mind: "There is but one sort of true wisdom, to take a true measure of one's self and not throw dust in one's own eyes."

I should have enjoyed writing his obituary notice. I would like to have written of him what was said, years later, of an Oxford teacher: "He loved great things, *and thought little of himself; desiring neither fame nor* influence, he won the devotion of men, and was a power in their lives; and seeking no disciples, he taught to many the greatness of the world and of man's mind."

* * *

Correspondents, both peripatetic and honorary, have recently complained about the F.R.C.S. and D.N.Y. examinations; so let me, among the trumpetings of these great men, insert a diffident whimper about the M.B. This exam is near and very dear to me—but it is not nearly near enough, that is the trouble. The feeble-minded among us *are referred for three months (three,* mark you) but we have to wait six for the next opportunity. The senior members of the profession, who decide these things, looking back on their century of service, may well argue that three months is little in a man's life, but let the senior member break his glasses in July and hear that they can't be repaired till October. My friends, though commiserating with me last April, were envious, too. "Think of it," they said, "the whole summer and nothing to do but revise for half of one part." I was pleased as well as annoyed. I could read all those Penguins I had bought and never opened, I could go to the theatre as often as a civilised man ought, I could read diffusely and indiscriminately among the textbooks instead of looking up "the things they ask." But my friends dash off parts of the Conjoint and qualify all round me. "Utility Doctor!" I say with scorn, the bitter because I envy them. I could do the same of co take the whole Conjoint at once, but forty-odd gu more than I can raise, in addition to M.B. fees, f *diploma I don't really want.*

Then hanging over me throughout this lazy summ the possibility that I might fail next time. At ni dream that I get Snodgrass, who is notorious for spe a whole viva plugging away at some obscure detail. breakfast I know that in six months I can learn so that even Snodgrass won't be able to catch me. By t time I break for coffee in the morning I know that do nothing but this subject, which has never inter me anyway, for six months I shall go mad. Per if I were a Good Type I would be sufficiently inter in every specialty of medicine to immerse my se any one of them for half a year.

Why not an M.B. exam every three months, like t Conjoint? Perhaps because far fewer students w take the latter (about 40% of students from Lo schools register on a diploma and take a degree la If only somebody would do something about Goodenough report, all would be well. But while plann smacks of Mr. Bevan, and free competition between t licensing bodies is in Bad Taste (and it lowers the pric *but we won't mention that)* what is a poor student to

* * *

Oh the London Deans,
The Provincial Deans;
Oh the deans brought up on medicated beans;
Oh the tall deans,
Short deans,
Much too fond of sport deans;
Oh the deans with the means to support deans;
Oh the long-nosed deans;
Oh the pin-toed deans:
Oh the stiff-necked, the bottle-necked
Oh the duff-stuffing, snuff-puffing, dottle-de
Deans.

* * *

One of the snags of the Army is the lack of resp *sibility—it is far too easy to* "pass the buck." E the R.A.M.C. are not exempt. Specialist service a too easily available—far too many patients are se for specialist opinion or for admission to hospital with being examined properly, if at all. This lack of the se of responsibility particularly applies to those who h never been in civilian practice. Whether a M.O. does job well or not makes no difference to his pay or pro tion prospects. Unless he is moved from within to d his best for his patients, and unless he feels a sens responsibility for their welfare, he will be a bad doc Unfortunately, no legislation can remove this de from an organised medical service, where there is struggle for existence and no incentive to work ha Presumably the solution is the more careful selec of candidates for medicine?

* * *

I wonder when the scientific mind will get to work our birthdays. Probably they are fairly well down t list, but I fear the day is inevitable when the cold st of common sense will wash away much of the hap hazardness of this event. For instance, I turned up March 2, 1923. On the icy pavement of the pr winter my mother probably had several shots at prec tating my arrival at times when I was just getting p the lizard stage. When the time did come, the do was messing around in his car in the last snow *before spring and gave neither* of us a helping h My father saved up his last winter cold for me, so th I was grappling with a bronchopneumonia whe should have been devoting my leisure to integrating personality.

I should imagine birthdays will be restricted to Ju July, and August, probably largely by the prohibit of contraceptives in September, October, and Novem and their free supply for the rest of the year. Child will be unanimously in favour as it safeguards them fr the tragedy of a birthday next door to Christmas, wh presents and parties are usually miserably telescop Parents will put up only sporadic resistance. Th organised fight will come from the vested interests: th contraceptive manufacturers struggling for their priva enterprise and obstetricians for their summer holidays.

Notes and News

THE CAPITATION FEE

AST Saturday the Ministry of Health announced that capitation fee payable to doctors for each insured person heir lists under the National Health Insurance Acts has ı increased from 10*s*. 6*d*. to 12*s*. 6*d*. with effect from Jan. 1, . Accumulated back payments will be made in the near re—if possible at the end of September.

he extra cost of the new fee during the period between . 1, 1946, and April 1, 1948, when the National Health rice will come into operation, will be about £4,500,000. ussions on the subject between the Ministry and the rance Acts Committee were summarised in our issue of ust 3 (p. 166).

THE STUDENTS' JOURNAL

HE development, in a few years, of the British Medical dents' Association from a relatively sluggish section of National Union of Students has been almost as remarkable he metamorphosis of a caterpillar. This year the associa- has published the first issue of the *British Medical dents' Journal*, an international number, well written and duced, and illustrated by good photographs. It tells the story he first World Student Congress to be held since the war.

" On the 17th November, 1939, the Charles University in rague was closed by the German authorities, nine heads of e students' organisation were shot, and a large proportion f the male student population was thereafter thrown into oncentration camps or sent to forced labour inside ermany."

ugee students and British students decided together that day should be remembered as International Students' ; and the first celebration of it was held in Prague last r. The great welcome given to students of all countries went to this gathering and the plans made for their ussions and for their entertainment evidently moved ply those who attended, and must have done much to ablish that sense of fellowship on which the peoples of the ld must rely for a safe and constructive future.

his journal makes impressive reading.

PATENT-LAW REFORM

HE Joint Chemical Committee on Patents submitted a morandum to the Board of Trade Patents Committee in tember, 1944; some aspects of the views therein contained, ecially in relation to chemical manufacture, the exploitation medical discoveries, and the preservation of secrecy, were cussed here at the time (*Lancet*, 1944, ii, 542). In June of s year the Joint Committee produced a second memoran- n, covering wider considerations of patent-law reform. e two documents have now been reprinted in a single volume lished by the Association of British Chemical Manu- turers (3*s*. post free). Some of the recommendations have eady found favour and are included in the Second Interim port of the Departmental Committee (Cmd. 6789). Patent is repulsively technical, but those who understand these steries will find much to interest them in the new publication.

o take a casual instance of the complication of the law, the kward interpretation of words like "manner of manu- ture" has been illustrated by the recent discovery of erful insecticides. Hitherto little more than chemical iosities, certain substances have been found to possess at industrial significance. Being new, the discoveries uld confer patentable "subject matter" in their novel lustrial application as insecticides. The application is the nufacture, but, since the substance was already known, the nufacture lacks novelty and is unpatentable. Killing ects is not manufacture. The only patent cover obtainable or some novel composition containing the active substance n other words, for the mixing of the substance with a ent. So what is intrinsically unpatentable becomes entable by the addition of a non-inventive stage. The nufacture would be patentable, if novel; the mixing of some nmon diluent is relied upon to provide the necessary elty. In Holland and the United States, as in pre-war rmany, it appears, the use of substances as insecticides has n patentable.

wo matters in the memorandum may be mentioned as of erest to the medical profession. Under section 38A of the tents Act, compulsory licences may be granted in respect patents relating to food and medicine. No great use has n made of the powers in the section, though they may have indirectly inclined pharmaceutical manufacturers to grant licences by voluntary agreement. The Joint Committee observe that difficulty has occurred in interpreting section 38A because the section deals both with chemical inventions and also with inventions relating to food and medicine. They suggest that when the Act is rewritten the section should be split and the two classes of invention separately treated.

Secondly they note that the royal prerogative reserved to the Crown by section 97 has lately been exercised to refuse a patent concerning a device for calculating the "safe periods" for marital intercourse, and that under section 75 patents have been refused for contraceptive chemicals and devices. The Act at present embodies this jurisdiction to refuse recognition to patents "contrary to law or morality." The Joint Committee think that the words "or morality" might be deleted from the statute. Such inventions, they say, may be useful contributions to medical knowledge and it is difficult today to regard them as necessarily contrary to public morals. "Many patented inventions are capable of abuse with much more devastating results, and we urge that patent specifications are a form of literature which should be regarded as 'technical' equally with the *Lancet* and the *British Medical Journal*."

CENSUS OF HOSPITAL CASES

THE Glasgow Bureau of Health and Sickness Records, of which Prof. T. Ferguson is chairman, is undertaking a census of all hospital-treated sickness occurring among people domiciled in the county of Stirling (including the "large burghs" of Falkirk and Stirling) during the year beginning on Oct. 1. The intention is to cover all kinds of sickness, including mental illness, and to collect information about Stirlingshire cases not merely from hospitals within their area but also from city and other hospitals to which patients in the county commonly go for treatment. The aim is to get a fairly complete picture of the nature and extent of hospital-treated sickness in what is a fairly typical and representative Scottish county area. The information thus obtained may well point the way to useful administrative action.

BRITISH BOOKS ON SHOW IN SWITZERLAND

AN exhibition of British books, old and modern, general and technical, will be opened in Berne on Sept. 3, and will later be shown in Bâle, Zürich, Geneva, and Lausanne. The first exhibit is an original leaf of the *Chronicles of England*, printed by Caxton in 1480. A separate section will be devoted to the periodical press. The display, devised by the British Council, follows four months after an exhibition of Swiss books in London.

INVALID AND VOIDABLE MARRIAGES

"MARRIAGES are also void in the case of certain diseases. Information about these should be sought from a reliable medical man." Reading this statement in a book, a clergyman asks us for further facts.

There are certain requisites for a valid marriage, and if any of these is absent the marriage is void ab initio: (1) both parties must be over sixteen years of age; (2) both parties must be mentally capable of understanding the nature of the contract; (3) the parties must not be within the prohibited degrees of relationship; (4) both parties must freely consent, consent obtained by duress or force being void, but not consent obtained by fraud; (5) there must not be an already subsisting marriage which is valid; and (6) the ceremony must be in proper form.

It will be seen that there is no provision for invalidity on the grounds of disease, apart from (2) above. There are certain grounds upon which a marriage is *voidable*, but this does not mean that the marriage was originally unlawful, and indeed in all these cases it is entirely at the option of the party aggrieved whether the marriage is avoided or not. Even in the case of venereal disease the petitioner must satisfy the court that he or she was unaware of it at the time of the marriage and refused intercourse on learning of it (Matrimonial Causes Act, 1937). The clear implication is therefore that such disease is no bar to a valid marriage.

The grounds of voidability are (1) incapacity due to incurable physical mental or moral disability; (2) wilful refusal to consummate; (3) unsound mind or mental deficiency of one party of which the other was ignorant at the time of the marriage; (4) communicable venereal disease subject to the proviso above mentioned; (5) pregnancy of the respondent by another man at the time of marriage. In all these cases the marriage is valid until avoided, and in the last three petition must be made within a year of marriage.

MEDICINE IN THE ROUGH

Dr. Edwin Seaborn has produced an unusual volume of medical history.[1] It is an epic of the adventures and untold difficulties of the pioneer surgeons of the prairies, and it tells of traders and log cabins, of medicine chests, wagons, and canoes, of sorties and ambushes, of buffaloes trapped in the snowdrifts, and of amputations rudely performed with the huntsman's knife. We read of François Guitault, Cartier's own physician on the voyage of 1534, who saw the Indians prescribe, for the treatment of scurvy, a broth of the green tips of spruce; of André Arnoux, who dressed the wounds of Monctalm after the battle on the plains of Abraham in 1759; of Sieur de la Salle, whose romantic travels ended, after rebuilding the fort at Starved Rock, in the naming of the State of Louisiana for his monarch Louis XIV; of René Goupil, surgeon of Anjou, and later donné in the Jesuit Mission at Quebec, who, after being cruelly tortured by the notorious Iroquois, was treacherously slain with a tomahawk in the Huron territory; and of Etienne Bouchard, of Montreal, who in 1654 perfected for his patients a comprehensive insurance scheme against all illness other than plague, smallpox, leprosy, epilepsy, and stone requiring the knife.

Indians abandoned themselves to unmitigated sorrow and ceremonial dancing when the smallpox was rife, for death they expected daily. Wolf Chief, the Brave, cocked his gun as naked he advanced on the fort, swearing vengeance on the pale-faces whom he blamed for the fatal disease; and the pipe remained unsmoked so long as the daily toll of victims grew. The practice of inoculation seems to have been known to the Red Indians, but Dr. Seaborn is surely in error when he asserts that George Christian Anthon was a protagonist of vaccination before Jenner; for the account he gives earlier of the practice of vaccination, is that of inoculation. The backwoods of medicine in the raw are shown up in the story of the theft of the solitary iron bedstead from the Port Stanley Cholera Hospital, of the futility of the hospital at Turkey Point which cost £53 but was never used, and of the objectionable practice of salting up for future dissection the unhappy victims of the gibbet.

We like the illustrations of Patrick Donnelly with his Schubert-like face, of Henry Saunders with his speedy penny-farthing, and of George H. Wilson who dressed like a cossack. We are taken also with the pictures of the early medical schools and of Dr. Joseph Lancaster's unique octagonal house. Dr. Seaborn's careful research into the history of Canadian medicine will rank as a classic of its kind, and the reader will pay his tribute to those who practised their art and profession and gave of their best on the lonely trails of the West.

DOCTORS TO BELONG TO TRADE-UNION?

At a recent meeting of the Salford city council a resolution was passed recommending the council to direct that all its employees "shall be members of their appropriate trade-unions or organisations." A suggestion in the lay press that the British Medical Association would not be recognised as a suitable organisation has been denied by the promoters of the resolution, who have also stated that the resolution was intended to refer primarily to non-union manual workers, and that if it was applied to doctors and nurses they would be free to join any association they choose. We understand that in fact the doctors and nurses working for the council have not so far been asked to comply with the resolution. Dr. J. L. Burn, the medical officer of health, has informed his colleagues that he would strongly resist any suggestion of pressure on the medical staff to join a trade-union or any particular organisation.

A resolution in similar terms is, we are informed, being considered by other local authorities.

Mr. A. Tudor Edwards, surgeon to the Brompton Hospital and surgeon in charge of the department of thoracic surgery at the London Hospital, died at St. Enodoc, Cornwall, on August 25. He was 56 years of age.

Dr. Earl Carlson, of New York, will deliver a lecture on Cerebral Palsy in Children at 4 P.M. on Monday, Sept. 9, at the London School of Hygiene, Keppel Street, W.C.1.

The Croix de Chevalier of the Legion of Honour and the Croix de Guerre avec palme have been conferred on Mr. Rowley Bristow.

---

[1] Seaborn, E. March of Medicine in Western Ontario. Toronto: Ryerson Press. London: obtainable from Hatchards. Pp. 386. 30s.

Return to Practice

The Central Medical War Committee announces th following have resumed civilian practice:

Mr. D. N. Matthews, O.B.E., M.CH., F.R.C.S., 152, Harley W.1. (Welbeck 2714.)
Dr. Kenneth Robson, F.R.C.P., 57A, Wimpole Street, (Welbeck 0270.)
Miss Margaret Salmond, M.B.E., F.R.C.S., F.R.C.O.G., 121, Street, W.1.

Medical Diary

SEPT. 1 TO 7

Monday, 2nd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.
3.45 P.M. Prof. R. A. Willis: General Pathology of Definition, Classification, and Nomenclature.
5 P.M. Dr. C. A. Keele: Autonomic Drugs.

Tuesday, 3rd

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Structure and Growth of Tumours.
5 P.M. Dr. C. A. Keele: Autonomic Drugs.

Wednesday, 4th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Structure and Growth of chymal Tumours.
5 P.M. Dr. Michael Kremer: Spinal Cord.
MEDICAL SOCIETY OF THE L.C.C. SERVICE
3 P.M. (Queen Mary's Hospital, Carshalton.) Clinical

Thursday, 5th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Structure and Growth of Tumours.
5 P.M. Dr. Michael Kremer: Cerebellum.

Friday, 6th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Structure and Growth of End Tumours.
5 P.M. Dr. Michael Kremer: Concussion.

Appointments

HARKNESS, J. W. P., C.M.G., M.B. Glasg.: medical advise Comptroller for Development and Welfare in the West
KING, D. P., M.A., M.D. Camb.: bacteriologist, Charing Hospital, London.
TIBBLES, SYDNEY, L.R.C.P.E.: eye specialist to Kent and county councils.

London County Council mental health services:

BUTLER, E. N., M.R.C.S., D.P.M.: first asst. M.O., Cane Hill pital, Coulsdon.
CRAWFORD, J. M., M.D. Edin., D.P.M.: first asst. M.O., St. Hospital, Southall.
KIRMAN, B. H., M.D. Lond., D.P.M.: deputy medical dent, Fountain Hospital, Tooting.
STIRLING, PAULINE, M.B. Edin., D.P.M.: first asst. M.O., Hospital, New Southgate.
TUCKER, G. M., M.B. St. And., D.P.M.: first asst. M.O., Park, Dartford.

Royal Sheffield Infirmary and Hospital:

BRODY, H. P., M.R.C.P.: physician.
LEISHMAN, A. W. D., D.M. Oxfd, M.R.C.P.: physician.
SKIPPER, E. W., M.D. Lond., M.R.C.P.: physician.

Births, Marriages, and Deaths

BIRTHS

BRINTON.—On August 24, in London, the wife of Dr. W. D. of Victoria Road, W.8—a daughter.
CURNOCK.—On August 17, at Chingford, the wife of Dr. Curnock, of Wanstead—a son.
DAY.—On August 20, at Cranford, Middlesex, the wife of Dr. Day—a son.
DIVINE.—On August 19, at Huddersfield, the wife of Dr. Divine—a daughter.
GOTLA.—On August 17, the wife of Dr. Dudley Gotla—a
HUTCHIN.—On August 18, the wife of Dr. K. C. Hutchin, of Herts—a daughter.
JONES.—On August 18, the wife of Dr. J. M. Jones, of Sussex—a son.
KELLY.—On August 18, in London, the wife of Dr. Kelly—a son.
LANKESTER.—On August 21, at Oxted, Surrey, the wife of Dr. Lankester—a son.
MURRAY-LYON.—On August 17, in Edinburgh, the wife of Ranald Murray-Lyon—a son.
RICHARDSON.—On August 21, the wife of Mr. J. E. M.S.—a daughter.
SCOTT.—On August 15, the wife of Dr. C. J. Scott, of Canterbury, Kent—a daughter.
WOOD.—On August 20, at Oxford, Dr. Elizabeth Wood Sutcliffe), wife of Dr. Ben Wood—a son.

MARRIAGES

WASS—BLAIKIE.—On August 20, at Brighton, Samuel Hall F.R.C.S., of Kensington Mansions, London, S.W.5, to Vaudine Blaikie.

DEATHS

KINSEY-MORGAN.—On August 21, at Boscombe, Augustus Kinsey-Morgan, F.R.C.S.E.
TUDOR EDWARDS.—On August 25, at St. Enodoc, North Arthur Tudor Edwards, M.D., M.CHIR. Camb., F.R.C.S.,

EPIDEMIC THROMBOPHLEBITIS
IN THE EAST AFRICA COMMAND

P. E. C. MANSON-BAHR
M.B. Camb., M.R.C.P., D.T.M. & H.
UT.-COLONEL R.A.M.C., LATE MEDICAL DVISER TO EAST AFRICA COMMAND

A. D. CHARTERS
M.D. Camb., D.T.M. & H.
LATE MAJOR R.A.M.C., MEDICAL SPECIALIST

NON-SUPPURATIVE thrombophlebitis may be primary secondary. Secondary thrombophlebitis may be the ult of trauma, local infection, general debilitating eases, or fevers, such as typhoid, pneumonia, and luenza, or may follow operation or childbirth.

Primary thrombophlebitis, or thrombophlebitis grans, is relatively uncommon. Its cause is unknown, hough Boyd (1938) regards it as a type of thrombogiitis obliterans involving only the veins. Widely parate regions of the body are affected. There is no ation to pre-existing disease or trauma of the vessels. lmonary embolism often occurs, and complete recovery usual (Swirsky and Cassano 1943). Gelfand (1943) scribes a condition of thick leg among Africans of uthern Rhodesia, the result of previous attacks of rombophlebitis of the femoral vein, which he states is t uncommon.

A syndrome of recurrent thrombophlebitis accomnied by pyrexia, often relapsing and sometimes sociated with stiff neck, occurred among askaris of the ast Africa Command during 1944.

No previous record of such a condition has been und. The outstanding nature of the disease is indicated the fact that the same clinical features have been dependently noted by several other medical officers: ajors Campbell and Wright, and Captains L. E. urkeman, A. W. Pringle, S. M. Pruss, G. M. T. Tate, . Slade, J. C. Enterican, and E. Taube.

EPIDEMIOLOGY

Occasional sporadic cases of thrombophlebitis, involvg one or more limbs, were observed in the command uring 1941 and 1942. In 1943 several patients were dmitted to hospital with œdema of unknown origin, robably the result of phlebitis, but it was not until anuary, 1944, that the disease began to assume epidemic roportions.

The syndrome first appeared in a localised area of the ommand among patients who had recently received reatment at a special treatment centre for venereal isease at Thika, near Nairobi. In April, 1944, cases of yrexia with stiff neck were described by Captain A. W. ringle at Au Barre, in British Somaliland; in August ie disease broke out among patients who had been reated at another special treatment centre for venereal iseases, this time at Mandera, British Somaliland, some 500 miles away from Thika. The outbreak reached its eak during the third quarter of 1944 and then rapidly echned. By the end of 1945 most of the recorded cases ere relapses.

The cases admitted to No. 1 (E.A.) General Hospital ud No. 3 (E.A.) General Hospital were as follows:

Quarter	*No. of cases*	*Quarter*	*No. of cases*
Jan.–March, 1944 ..	34	Jan.–March, 1945 ..	69
April–June, 1944 ..	81	April–June, 1945 ..	40
July–Sept., 1944 ..	204	July–Sept., 1945 ..	19
Oct.–Dec , 1944 ..	175	Oct.–Dec., 1945 ..	5
			627

hese two hospitals eventually received all the cases curring in Thika district. No accurate figures are tainable for the region of Mandera, British Somaliland, it the peak figures coincided with those in Kenya.

VARIETIES

The following account is drawn from the clinical features of 145 cases among East African soldiers resident in British Somaliland and Kenya during the period January, 1944–June, 1945. Three varieties of the syndrome were seen: (1) short-term fever with stiff neck often followed by relapses; (2) thrombophlebitis affecting one or more limbs, with a tendency to relapse; and (3) pyrexia, usually relapsing, without evident phlebitis. The same patient might show one or more of these varieties during the course of his disease. Thus a bout of pyrexia with stiff neck might be followed by an attack of thrombophlebitis, which in its turn might be succeeded by pyrexia without evident phlebitis.

History of the Disease.—The vast majority of the patients gave a history of having received treatment in one or other of the two special treatment centres for venereal diseases in the command. Of 83 cases in British Somaliland 58 had been admitted for syphilis and 4 for gonorrhœa. The remaining 21 cases gave no history of venereal disease and had not been resident in a special treatment centre.

History of Previous Injections.—Most of the patients had received a previous venepuncture for neoarsphenamine therapy, artificial pyrotherapy with typhoid-paratyphoid vaccine (T.A.B.), or diagnostic purposes. Of 143 cases questioned, 111 had been injected with neoarsphenamine intravenously and bismuth intramuscularly, and 9 had received either intravenous T.A.B. with intramuscular sulphapyridine or a diagnostic venepuncture. The remaining 23 gave no history of injection. The interval between the last injection and the onset of symptoms varied from three days to seven months. Of 100 cases receiving neoarsphenamine therapy, 79 developed symptoms within six weeks of the last injection. The total dosage of arsenicals administered varied from 1·65 to 6·6 g., the average being 4·4 g.

SHORT-TERM FEVER WITH STIFF NECK

This form developed either as the first phase of the syndrome or as a sequel to previous attacks of phlebitis. The onset was abrupt, though there was usually no rigor. Severe pain in the neck came on with the general symptoms of fever. On examination the patient had a raised temperature with stiffness of the neck (but no head-retraction) and tenderness of one or more muscles, most commonly the sternomastoid or the trapezius. If only one side was affected, torticollis was a common sign.

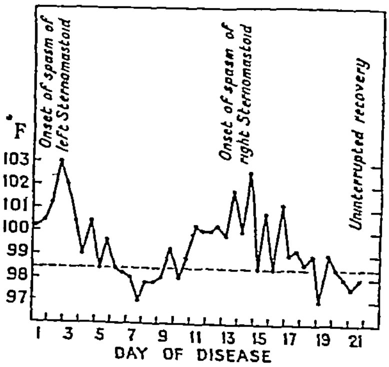


Fig. 1—Short-term fever with stiff neck, followed by stiff neck involving a different muscle.

The duration of pyrexia varied from two to thirty days, the usual course being about four days, and the temperature falling by lysis (fig. 1). The fever was commonly relapsing, the relapse being accompanied either by another bout of stiff neck, or by an attack of thrombophlebitis, or occasionally without either. Of 62 cases of short-term fever with muscle stiffness, the sternomastoids were involved in 25, trapezius 21, infrahyoid muscles 3, posterior cervical 3, neck muscles unspecified 5, erector spinæ 4 cases, and masseters 1 case.

No significant enlargement of the cervical glands was noted; neither was any evidence of cervical thrombophlebitis detected. There was no sign of meningitis, Kernig's sign being invariably negative and cerebral irritation consistently absent.

Laboratory Investigations.

Frequent examination of *blood smears* did not show either spirochætes of relapsing fever or any other parasite.

Leucocyte counts were performed in 11 cases: the total count was below 8000 per c.mm. in all cases, and a relative lymphocytosis was found in 7 of them.

The *cerebrospinal fluid* was examined in 12 cases, in 3 of which there was a cell-count of over 8 per c.mm. (all lymphocytes), the remaining 9 showing no abnormality.

THROMBOPHLEBITIS AFFECTING ONE OR MORE LIMBS

This variety was usually acute, less commonly subacute, and occasionally assumed unusual features.

(*a*) *Acute Thrombophlebitis.*—Symptoms developed either as a sequel to an afebrile period following an attack of stiff neck, or as the first incident in the course of the disease. There was an acute onset of fever, with severe pain in one limb over the site of a vein, and examination revealed severe tenderness over the affected vessel, the limb being held in protective flexion when a popliteal or antecubital vein was affected. In the event of a superficial vein being involved—e.g., the cephalic or the internal saphenous vein—the vessel could be palpated as a thickened tender cord throughout its length, it being, not uncommonly, possible to palpate a thrombosed internal saphenous vein for the whole of its course from ankle to groin. Pitting œdema was present and was particularly severe when a deep vessel, such as the femoral vein, was attacked. After an afebrile period *a relapse of fever often occurred,* accompanied by thrombophlebitis in another limb (fig. 2), or by stiff neck, or without any localising signs. The thrombosed vein, if superficial, sometimes persisted as a thickened hard fibrosed cord for many months, and was still palpable on discharge of the patient from the Army or the hospital.

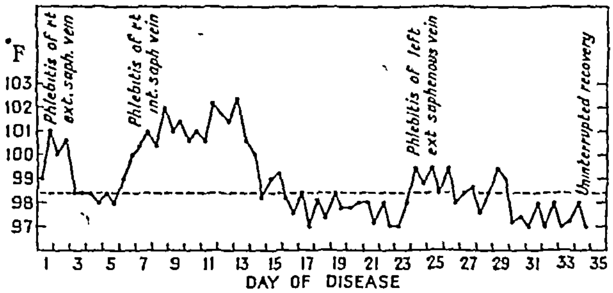


Fig. 2—Pyrexia with phlebitis, followed by two relapses with fresh phlebitis.

Special Investigations

White-cell count was performed in 26 cases. In 22 the total count was below 10,000 per c.mm., and in 4 higher. Most showed a relative lymphocytosis.

Blood-culture was performed in 6 cases, in 5 of which cultures were sterile. *B. fæcalis alkaligenes* was recovered twice from one patient's blood-culture but was almost certainly a contaminant.

Biopsy of an affected vein was carried out on 6 occasions. Some of the cases were acute and others chronic. On exposure of the affected vein under local anæsthesia it was seen to be greatly swollen, but not adherent to surrounding tissues. On section, the vein was found to be completely thrombosed in early cases; it was white and fibrous, sometimes with signs of recanalisation, in later stages. On microscopical examination no specific changes could be found. Examination of sections in acute cases revealed a simple thrombus occupying the vein, with no evidence of inflammation either of the vein wall or of the surrounding tissues. In more chronic cases organisation and recanalisation of the thrombus could be observed; one very chronic case showed *foreign-body giant-cells* in the almost completely organised thrombus. Suppuration was never observed; nor could any organisms be seen.

Culture of a vein at biopsy was performed on three occasions, a contaminant being grown in one case, the other two being sterile.

In 99 cases the following veins were involved:

One internal saphenous	15
Both saphenous	4
One femoral	22
Both femorals	21
One popliteal	21
One superficial arm vein	16
Superficial arm veins right and left	4
? Portal vein	2
	105

Of these patients 6 had phlebitis of both arm and leg.

(*b*) *Subacute Thrombophlebitis.*—Some patients were admitted with no other symptoms than œdema of one or both legs, with irregular pyrexia, pain being [illegible] absent and no thrombosed vein being palpable. The urine was free from albumin, and blood examination did not reveal anæmia. Recovery often took place without further complication, but in some cases a subsequent attack of stiff neck or of acute thrombophlebitis indicated the nature of the syndrome.

(*c*) Three *unusual varieties* may be mentioned:

(i) *Chronic.*—Two cases developed recurrent bouts of localised venous thrombosis every three weeks for five months. During each attack, which was accompanied by two or three days of pyrexia, a small tender nodule could be palpated along the course of a superficial vein. One of the patients had a typical attack of pyrexia with stiff neck, and the other developed an acute thrombophlebitis of his popliteal vein during the course of the disease. Biopsy of a nodule in each case showed an organised thrombus in a vein.

(ii) *Portal Vein Involvement* (probable).—Two patients developed ascites within a month of the termination of a course of neoarsphenamine and bismuth. Fluid thrill and shifting dullness were elicited. Œdema of the lumbar spine and legs was present in one case. There was no jaundice or albuminuria. No ova were found in stools or urine. The blood-pressure was normal. No hepatic abnormality could be discovered clinically. The ascites disappeared completely in both cases, within three months and one month. Both patients completely recovered and returned to their units fit for duty. Neither of the patients had stiff neck or thrombophlebitis of the limbs.

(iii) *Association with Arteritis.*—Two patients, admitted to hospital with phlebitis, developed thrombosis of the femoral arteries, with resultant foot gangrene. Each case required amputation of the leg above the knee, after which recovery took place.

(*d*) *Complications and Sequelæ.*—A notable feature was the complete absence of embolism. A common sequela was persistent œdema of one leg; because of this many patients had to be invalided out of the Army. No death resulted from this disease in these 145 cases.

PYREXIA, USUALLY RELAPSING, WITHOUT EVIDENT PHLEBITIS

This variety was characterised by irregular pyrexia lasting from three days to three weeks, without evident phlebitis. In some cases the pyrexia ensued as a sequel to an attack of stiff neck or phlebitis; in other cases one or other of these syndromes developed as a complication after the termination of the fever. But many cases displayed no localising signs, the diagnosis being suggested by a history of recent antisyphilitic therapy, and by the coexistence in the same area of more typical cases of the disease.

DIFFERENTIAL DIAGNOSIS

Pyrexia with Stiff Neck.—The differential diagnosis from relapsing fever, cerebrospinal meningitis, and malaria was readily settled by the repeated absence of spirochætes and malaria parasites from the blood, and by the normal cerebrospinal fluid. Acute myalgia of neck and shoulders in epidemic form has been described by Beeson and Scott (1942), and cases of persistent myalgia following *sore throat* have been recorded by hton and Jones (1942), but in neither instance ıny association with thrombophlebitis or injections ioned.

rombophlebitis.—The acute form had to be diagnosed pyomyositis, which was differentiated by the marked local swelling, the absence of signs over site of a vein, the absence of peripheral œdema, the tendency to pus formation.

bacute bilateral thrombophlebitis of the legs had distinguished from other causes of œdema, such as ritis, anæmia, cardiac failure, vitamin-B_1 or protein iency, and epidemic dropsy. The differentiation these diseases only arose in those cases where no of thrombophlebitis was evident. Examination urine, blood, and cardiovascular system readily uded renal, blood, and cardiac disease. Beriberi eliminated by the absence of neurological or of liac abnormality, and protein deficiency was excluded he normal plasma-protein level (estimations in 3 cases 8·95 mg., 8·83 mg., and 8·36 mg. per 100 c.cm.). residual swelling was distinguished from filariasis the pitting character of the œdema.

elapsing Pyrexia without Evident Phlebitis.—When ver two weeks' duration this pyrexia had to be inguished from other long-term fevers, such as hoid, kala-azar, undulant fever, and miliary tuberısis. Negative cultural and serological reactions, ative sternal puncture, and normal chest radiograms luded these diseases. The history of recent treatment special treatment centre for venereal diseases, the istence of more typical cases of the disease in the e area, and in some cases the supervention of an ck of acute phlebitis or stiff neck clinched the gnosis.

DISCUSSION

t might be thought that the description which has n given is not that of a syndrome, but of a mixture of rt-term fevers, unrelated cases of thrombophlebitis, long-term undiagnosed pyrexias. They have been cribed together as a syndrome for the following sons:

A sudden outbreak of thrombophlebitis, with subsequent decline in numbers of cases, occurred in two widely separated areas of the command. Previous cases could scarcely have been missed, as reliable observers were present before the outbreak in these areas.

Several observers, who had had no previous information on the subject, made simultaneously and independently the observation of the association of the short-term fever with stiff neck, often followed by relapses, with thrombophlebitis affecting one or more limbs, and later with the pyrexia without evident phlebitis.

The association of these three manifestations is shown below:

	Cases
hort-term fever with stiff neck alone	8
hrombophlebitis alone	23
yrexia without evident phlebitis alone	8
ıort-term fever with stiff neck and thrombophlebitis ..	13
hort-term fever with stiff neck and pyrexia without evident phlebitis	5
hrombophlebitis and pyrexia without evident phlebitis ..	3
ıort-term fever with stiff neck, thrombophlebitis, and pyrexia without evident phlebitis	7
	62

n searching for the cause of this peculiar syndrome ee possibilities were entertained: (1) that it was a us disease like infective hepatitis; (2) that it was due the local effect of neoarsphenamine or other antiıhilitic drug on the vein; and (3) that it was allied marantic thrombosis.

'irus Disease.—The points in favour of a virus origin the relative lymphocytosis, the negative bacterioical findings, and its possible ætiological and epidemioical relationship to infective hepatitis in this comnd. The admissions for infective hepatitis to two ıeral hospitals at the time of this outbreak are shown in fig. 3. The similarity between the two curves will be noted. Most of the cases of infective hepatitis were so-called postarsphenamine jaundice in patients undergoing antisyphilitic treatment. That infective hepatitis can be transmitted by syringes has strong support. Of 62 patients developing this syndrome, 5 had previously had jaundice, and 2 developed thrombophlebitis while still undergoing treatment in hospital for jaundice. The theory that the present syndrome may be caused by a virus transmitted chiefly by needle puncture, but also by other means, such as droplet, urine, or fæces, is attractive.

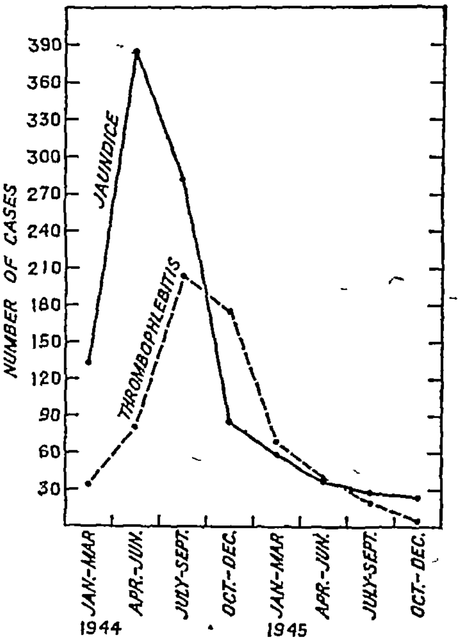


Fig. 3—Admissions to No. 1 and No. 3 (E.A.) General Hospitals of cases of jaundice and of thrombophlebitis from January, 1944, to December, 1945.

Rift Valley fever, a virus disease, is endemic in East Africa. The sera of two patients, taken in each case on the second and twenty-first days, were examined by Dr. K. C. Smithburn, of the Yellow Fever Research Institute, Entebbe, but no antibodies to the virus of Rift Valley fever were found.

Local Effect of Drugs on Veins.—The prolonged course of the pyrexia suggests that the cause of the phlebitis is an infection rather than a chemical irritation of the veins by antisyphilitic drugs. The predisposing effect of arsenic or bismuth cannot be doubted. It is possible that one or other of these drugs so damages the veins as to make them susceptible to infection. It will, however, have been noted that some of the patients had received no previous antisyphilitic therapy.

Marantic Thrombosis.—Thrombosis of limb veins occurs in severely malnourished persons, but most of these patients were healthy African soldiers of category A, who were better nourished than their civilian compatriots, among whom thrombophlebitis is unusual.

SUMMARY

A syndrome occurring in East African soldiers is described. The main features were pyrexia associated with stiff neck or thrombophlebitis, and usually accompanied by relative lymphocytosis. There is a great tendency to relapse.

The association with antisyphilitic treatment is emphasised.

The possible causes are discussed.

We are grateful to Brigadier R. P. Cormack, O.B.E., director of medical services, East Africa Command, for permission to publish this article, and to Major J. E. McClemont, R.A.M.C., for some of the pathological investigations.

REFERENCES

Beeson, P. B., Scott, T. F. M. (1942) *Proc. R. Soc. Med.* 35, 733.
Boyd, W. (1938) A Text-book of Pathology, Philadelphia, p. 449.
Gelfand, M. (1943) The Sick African, Cape Town, p. 140.
Houghton, L. E., Jones, E. I. (1942) *Lancet*, i, 196.
Swirsky, M. Y., Cassano, C. (1943) *J. Lab. clin. Med.* 28, 1812.

NAUSEA AND VOMITING OF PREGNANCY

A STUDY IN PSYCHOSOMATIC AND SOCIAL MEDICINE

G. GLADSTONE ROBERTSON
M.D. Glasg.

MY interest in the nausea and vomiting of pregnancy originated in some observations I made, in general practice, on dyspepsia in non-pregnant women. I had noted that a particular dyspeptic syndrome, usually attributed by its sufferers to "a weak stomach," was not uncommon in married women who were sexually frigid. A short account of this syndrome is as follows.

The symptoms usually began soon after marriage, or, if later, with the cessation of sexual interest. In its initial phases the syndrome usually appeared at times of the day which could be related to the impending threat of coitus—i.e., in the late evening—or at the week-end.

The earliest and most constant symptoms were abdominal distension, eructation of wind and of small quantities of gastric juice (usually termed "acidity"), and an increasing distaste for fats, with a decreased ability to digest them. Attacks of nausea appeared later, with or without vomiting, which was often described as "biliousness." Pain was present only in long-standing and severe cases, in which discomfort was almost constantly present. The condition was liable to persist indefinitely but with little or no deterioration in general health.

Some of the patients were known to me before marriage, when there was nothing to indicate that they were abnormal. As a whole they did not lean towards any personality group—e.g., hysterical or obsessional—or towards any special psychiatrical category, such as anxiety state. On the other hand, if the illness had lasted for years, it was the exception to find a patient who did not exhibit signs of anxiety.

A study of the emotional state of these patients at the time of the onset of symptoms revealed a common feature—i.e., sexual relationship with the husband gave rise to disgust. The digestive disorder appeared to be a physiological response to the repetitive effect of this emotion. Further, most of the patients came to dread coitus and to develop signs of anxiety. The subsequent nervous element was as clearly a response to fear as the digestive disorder was to disgust. Neither disorder was causally related to a primary psychoneurosis.

When I first recognised this syndrome in 1938 I named it "rejection dyspepsia" (unpublished). During the succeeding years I have confirmed the findings in many hundreds of women. In doing so I noted that a high proportion of them at marriage were unduly attached to their mothers. The syndrome is common and includes, almost without exception, married women labelled as having visceroptosis and the great majority diagnosed as cases of nervous dyspepsia. Towards the end of 1943 I became impressed with the observation that women with this syndrome invariably had a history of protracted or severe nausea and vomiting during their pregnancies.

These and other observations suggested the possibility that the nausea and vomiting of pregnancy might also be related to frigidity. Accordingly I began to investigate my pregnant patients and the histories of their past pregnancies from this point of view. It appeared that frigidity in the strict sense—i.e., the experiencing of coitus as an act undesired in itself and unaccompanied by the attainment of orgasm—did not inevitably cause nausea and vomiting during pregnancy; but severe or long-continued vomiting in a frigid woman during pregnancy was related directly to the frequency of undesired and unappreciated coitus. A further characteristic associated with nausea and vomiting was that the woman was excessively attached to or dependent on her mother. This personality trait appeared to be relevant to nausea and vomiting even when the sexual functioning of the woman was "normal." Another characteristic which seemed to be ætiologically associated was a history of previous dyspepsia.

Serial Investigation of Pregnant Women

To evaluate the relevance of previous dyspe excessive attachment to the mother, and distr sexual functioning in the ætiology of the nausea vomiting of pregnancy, I investigated 100 consec pregnant women. The results are analysed in tal which shows that 57 had nausea or vomiting and 43 none. The latter group can therefore be regarde controls. The table shows that 6 out of 57 cases h history of previous dyspepsia, against none of controls; 20 out of 57 cases showed undue mother at ment, against 4 out of 43 controls; and 40 out of cases showed disturbed sexual functioning, aga 4 out of 43 controls.

These findings confirmed that a history of previ dyspepsia, mother attachment, and disturbed se functioning were ætiologically significant in the nausea and vomiting of pregnancy.

TABLE I—DETAILED ANALYSIS OF CONTROLS AND CAS

—	Cases	Previous dyspepsia	Mother attachment			Disturbed sexual functioning		
			1	*2*	Total	*1*	*2*	
Controls ..	43	0	4	0	4	4	0	4
Nausea and vomiting:								
Minor ..	31	5	6	0	6	14	4	18
Moderate ..	17	1	5	3	8	6	7	13
Severe ..	9	0	3	3	6	0	9	9

DEFINITION OF TERMS AND STANDARDS OF ASSESSMENT

Previous Dyspepsia.—This term refers to those patien who had had recurrent attacks of dyspepsia for se years *before marriage.* These comprise 6 cases only a number too small for further subdivision. The di order in 3 of these was said to have dated from "acidosis in childhood. All 6 had nausea and vomiting in preg nancy.

Mother Attachment.—The trend of development in th growing girl is towards an increasing freedom from th earlier dependence on the mother. On marriage, mo especially when she herself becomes a mother, a wom should be able to behave as an independent adult mothe In some women, however, the infantile and childi relationship with the mother persists, and they remai enclosed within the orbit of the mother's influence injunctions, and prohibitions. In other women th extreme devotion expressed for the mother is (to th appreciative observer) seen to be a compensation fo repressed aggressive tendencies directed against he Such tendencies are often found in a woman who is forced by circumstances to care for an invalid mother be attending to her own household duties during the ea years of marriage. If the young married woman to live with her mother or a mother substitute—e mother-in-law—the conflict between outward d (devotion) and inward resentment (hate) is exaggerat as a result of propinquity.

Mother attachment varies from woman to woma varies in its predisposing conditions, and varies in th same woman at different times. Its importance in th nausea and vomiting of pregnancy is usually greater during the earlier pregnancies. With the passage o years it tends to wear off and its ætiological influence tends to decrease.

For the purpose of this inquiry I have used the numerals 1 and 2 to indicate the degrees of undue mother attach- ment estimated to prevail at and immediately befo onset of the pregnancies studied. Thus, if after arriv the woman continues to visit her mother *daily* ates her dependence on her by making no decision nportance without consulting her the degree of ıer attachment was assessed as 1. When dependence ıis sense is very pronounced, or when the patient ribed her interest in her mother as being greater her interest in her husband, the degree of mother chment was assessed as 2.

hy should undue mother attachment be the equi- nt of a disgust factor in the subconscious? A hiatrical interpretation might infer that the first essive feelings of the baby are directed towards the her and are associated with anal activity. When ater life, as a result of cultural influences, bodily etions become linked to dirtiness and filth, any ressive feeling towards the mother becomes like- associated with filth. The psychiatrist tells us that -devotion to the mother is a disguise or compensation aggressive tendencies.

nother and less complex explanation may be given ch has the advantage of being more easily grasped the patient. At various periods in the growth of the mal child he takes or steals what he desires, lies to ıpe punishment, and later becomes interested in his y and genital functions. These impulses are con- led and corrected chiefly by the mother, and as he uires cultural education he tends to become ashamed ıis past behaviour. This is shown by the inability he average person, of any age, to discuss without barrassment certain subjects, particularly of a sexual ure, in the mother's presence. It can even be said t for the remainder of his life the very sight of his her induces in him subconscious shame.

isturbed Sexual Functioning.—An obvious form of urbed sexual functioning is frigidity in the sense t the woman has no interest in coitus, never experi- es orgasm, and may have vaginismus. My own ervations indicate that about 10% of married women into this category of complete frigidity throughout whole of their married lives, and that many others, ecially overworked women with large families, ulti- tely reach such a state. Most women with this racteristic were noted to have undue mother attach- nt before and during the early years of marriage. seems that well-marked emotional entanglement with mother tends to inhibit the normal expression of the man's love for her husband. That the public mind ware of the discomfiture experienced by the husband ough undue interest on the part of his wife in her ther is shown by the popularity of mother-in-law es (invariably the wife's mother). Other forms of turbed sexual functioning related ætiologically to the ısea and vomiting of pregnancy are continuous loss exual interest and inability to attain orgasm. Among factors associated with and precipitating these are the part of the woman) ill-health, frequent child- ring, and fear of pregnancy.

Jnderstanding of these conditions is, however, incom- te unless account is also taken of the sexual ıctioning of the husband, which may show either xpertness or disturbance. For example, excessive tal demands made by the husband may, if long eated, induce in the woman feelings of revolt and gust, attended by loss of sexual interest. Infrequent ercourse, on the other hand, is not so likely to build a massive reaction of disgust. This is illustrated the absence of sickness in the strictly frigid married man who has intercourse on relatively infrequent asions and in the unmarried woman who has inter- ırse only once or twice in the absence of orgasm and en in the presence of painful discomfort. Continued culatio præcox in the husband during early married may also lead to the growth of disgust in connexion h coitus, because it prevents the wife from realising npleted orgasm and the sexual act becomes associated h mere messiness. The inability of the woman to ain orgasm may also be determined by the repeated ıctice of coitus interruptus.

Inquiry was also made into the proportion of coital acts undesired by the wife and the proportion of coital acts in which she did not attain orgasm during the months preceding conception. Sexual functioning was regarded as reasonably normal when the proportion of undesired coitus and absence of orgasm did not exceed 20%. When either proportion exceeded 20% but was less than 60%, the disturbance of sexual functioning was assessed as 1; when the proportion exceeded 60%, the disturbance was assessed as 2.

Coital Infrequency.—As the theme of this discourse implies that pregnancy sickness is caused by a massive "disgust" factor in the subconscious, some method had to be devised to exclude from the disturbed sexual functioning category those patients who had experienced coitus on relatively infrequent occasions. Accordingly, no patient was included in this category in table I if coitus took place less frequently than once a month or six times in all.

Thus, disturbed sexual functioning was not taken into account in 6 controls, although all were frigid in the sense of the definition given above: 2 were unmarried and had experienced coitus on three and four occasions; 2 had married soldiers towards the expiry of embarkation leave; and 2 had been married for some years but asserted definitely that coitus had not taken place oftener than eight or nine times a year.

Though undesired coitus during pregnancy might well have a bearing on the severity of sickness, it was found expedient to limit the inquiry to a period of a few months before the beginning of pregnancy. Many of the women had not experienced coitus during pregnancy, notably the wives of men serving with H.M. Forces.

Degree of Nausea and Vomiting.—The cases were divided into three groups: minor, moderate, and severe. In the minor group nausea, retching, or vomiting lasted less than six weeks; in the severe group those symptoms were prolonged beyond five months, or, if of shorter duration, were of such severity as to be classified as true hyperemesis gravidarum—i.e., the fluid output exceeded fluid intake. The moderate group lay between the minor and severe groups.

DETAILED ANALYSIS

Detailed analysis of controls and cases is given in table I which shows that minor cases (31) were almost twice as common as moderate cases (17), and these in turn almost twice as common as severe cases (9). This table also indicates clearly that the ætiological significance of mother attachment and disturbed sexual functioning is higher in severe than in moderate cases; higher in these than in minor cases, and higher in minor cases than in controls. Thus the percentage with mother attachment in controls was 9; in minor cases 19; in moderate cases 47; and in severe cases 66. The percentage with disturbed sexual functioning in controls was 9; in minor cases 58; in moderate cases 76; and in severe cases 100. The greater significance of both mother attachment and disturbed sexual functioning in severe than in minor cases is also indicated by the progressive percentage increase in degree-2 cases compared to degree-1 cases as we pass from the minor through the moderate to the severe group.

Variations of Nausea and Vomiting in Successive Pregnancies in the same Woman.—The series of 100 pregnant women comprised both primiparæ and multiparæ. The multiparæ numbered 63 and between them gave a history of 175 previous pregnancies. The syndrome of nausea and vomiting was not necessarily a constant feature for successive pregnancies in the same woman. Some of the controls in this series were "cases" in their previous pregnancies, and vice versa. The presence or absence of vomiting in any single sequence of pregnancies in the same woman could usually be related to the life situation prevailing before conception—e.g., the relationship to the mother, the attitude towards the husband as a person, and the behaviour of the husband as a lover. An analysis of the 175 previous pregnancies gave results which corresponded to those obtained in the present series of 100 pregnancies.

Table II shows, in six illustrative cases, the sickness variability in a succession of pregnancies in the same woman and the significance of previous dyspepsia, mother attachment, disturbed sexual functioning, and coital infrequence. Though these cases were selected they are typical of the entire series comprising 275 pregnancies.

CASE 1.—A sequence of five pregnancies free from nausea or vomiting in the absence of the factors previous dyspepsia, mother attachment, and disturbed sexual functioning. She desired the first, was resigned to the following three, and averse to the last. In no patient does conscious attitude to pregnancy bear any relationship to sickness.

CASE 2.—Occasional attacks of biliousness dating from school days. When previous dyspepsia is the only factor, the degree of sickness is usually constant in all pregnancies in the same woman.

CASE 3.—Devoted to and nursed mother with pernicious anæmia. Mother died shortly after pregnancy 5. Disturbed sexual functioning throughout the years of marriage was 25%.

CASE 4.—Lived next door to and assisted her mother, to whom she was much attached until after pregnancy 3. On removing to another district she became detached from her mother. After pregnancy 4 her sex interest began to wane. After pregnancy 5 she became completely frigid.

CASE 5.—This woman was completely frigid. Her husband, like many married to such women, became a drunkard and later unfaithful. He contracted syphilis after pregnancy and they separated. Before conceptions 8, 9, 10, and 11 broke into the house (on the evidence of a neighbour and her own testimony) and intercourse took place on only occasion before each pregnancy.

TABLE II—SICKNESS VARIABILITY IN SUCCESSIVE PREGNANCIES IN 6 TYPICAL CASES, SHOWING SIGNIFICANCE OF PERSONALITY FACTORS

Case	Pregnancy	Age (year)	CAP	PD	MA	DSF	CI	Total points	Nausea and vomiting
1	1	20	D	0	0	0	—	0	0
	2	21	R	0	0	0	—	0	0
	3	24	R	0	0	0	—	0	0
	4	27	R	0	0	0	—	0	0
	5	31	A	0	0	0	—	0	0
2	1	27	D	1	0	0	—	1	1
	2	31	D	1	0	0	—	1	1
	3	40	R	1	0	0	—	1	1
3	1	20	D	0	2	1	—	3	3
	2	22	D	0	2	1	—	3	3
	3	24	D	0	2	1	—	3	3
	4	26	D	0	2	1	—	3	3
	5	28	D	0	2	1	—	3	3
	6	33	A	0	0	1	—	1	0
4	1	18	D	0	1	0	—	1	1
	2	19	D	0	1	0	—	1	1
	3	21	A	0	1	0	—	1	1
	4	23	A	0	0	0	—	0	0
	5	25	A	0	0	1	—	1	1
	6	27	A	0	0	2	—	2	3
	7	28	A	0	0	2	—	2	3
5	1	20	D	0	0	2	—	2	1
	2	22	D	0	0	2	—	2	1
	3	24	D	0	0	2	—	2	1
	4	26	A	0	0	2	—	2	1
	5	27	A	0	0	2	—	2	1
	6	29	A	0	0	2	—	2	1
	7	30	A	0	0	2	—	2	1
	8	39	A	0	0	2	+	0	0
	9	40	A	0	0	2	+	0	0
	10	43	A	0	0	2	+	0	0
	11	44	A	0	0	2	+	0	0
6	1	31	D	0	2	2	—	4	3
	2	34	D	0	2	2	—	4	3
	3	36	D	0	2	2	—	4	3

The last pregnancy in each patient was one of the 100 consecutive pregnancies.

CAP, conscious attitude to pregnancy: D, desire for the pregnancy; R, resigned to being pregnant; A, averse *to the pregnancy*.

PD, previous dyspepsia.

MA, mother attachment.

DSF, disturbed sexual functioning.

CI, coital infrequency. A plus sign indicates the presence of this factor, when the DSF factor loses significance as an agent capable of causing sickness.

Total points are obtained by adding together degrees of PD, MA, and DSF. (DSF points not included if CI present.)

Degree of nausea and vomiting: minor 1, moderate 2, severe 3.

CASE 6.—She illustrates the effect of a combination of t factors mother attachment (to a marked degree) and comp frigidity. All pregnancies were complicated by hyperem gravidarum. The first two terminated in stillbirth at 29th and 31st week respectively. The third continued *the 35th week with survival of the child.*

Vomiting and Miscarriage in the Wives of Ex Service Men.—Although as has been indicated nausea and vomiting of pregnancy may be ætiologi complex, the practical considerations become narro down when a previous pregnancy was free from sickn During recent months, in the course of general practi I have encountered an unusually high proportion of m carriages preceded by severe vomiting among the of ex-Service men who had been absent for two or m years. Many of the wives had undergone one or m previous pregnancies without sickness. In such cas one would expect, in view of the findings recorded in th paper, that frequent undesired coitus had before the recent pregnancy; inquiry showed that was so.

Many men, returning home after an absence of years seem to be unaware that their wives have adjusted themselves to a different mode of life and may in fac have ceased to be in love with them in the physical sense The vigour, physical fitness, and sexual hunger of the men contrasts with the war-worn condition of th harassed housewife. If regular coitus is not preceded by a preliminary courtship there is grave danger not only of severe vomiting during an ensuing pregnancy, wi an apparent increased risk of miscarriage, but also alienation of the affection of the wife.

These and similar aspects of human contact a relationship, with their unlimited potential for unhapp ness and ill-health are the true kernel of Social Medicine The inception of university chairs of social medicine le one to believe that an endeavour was about to be ma to equip the doctor of the future to grapple with su problems, but apparently the subjects for research to be well-worn topics like vital statistics, drainage, a impurities in food and milk.

ADDITIONAL FINDINGS

The compilation of this series of patients began o April 1, 1944, and was complete in ten weeks. Wi the exception of three women who miscarried on th occasion of the first attendance, every pregnant wom treated in the course of practice was included in th series. Whether the pregnancy was at an early or at late stage during this period, recorded data were ava able from the first examination, and the inquiry was finally concluded until after the delivery of the patient.

The blood-pressure curve tended to rise more in patients who suffered from severe and protract vomiting.

Four patients had pyelitis during some stage of th pregnancy, and 2 had albuminuria. All 6 had nau and vomiting. In all these cases nausea and vomiting pre ceded the rise in blood-pressure, pyelitis, or albuminu

Most textbooks comment on the higher incidence of pregnancy sickness among "nervous" or "neurotic women. Most of the 100 patients were known to re during previous pregnancies and often before marria Nervous or neurotic trends were apparent in some bef marriage, but in others not until some time after marriage. The impression gathered was that the incidence of sick ness was definitely higher in the latter group. finding is consistent with the view that the sickness o pregnancy is not due to "nervousness."

Ætiology

he ætiology of the nausea and vomiting of pregnancy received considerable attention, but no definite nclusion has been reached. An excellent review of the ject was provided by Hall (1943). No toxin has n discovered. Willis et al. (1942) and Weinstein al. (1943) consider deficiency of components of the amin-B complex, notably vitamin B_6, to be a factor importance, whereas Kemp (1933), Bandstrup (1939), d Kotz and Kaufman (1940) emphasise abnormal anges in the maternal adrenal cortex. Shute (1941) d Schoeneck (1942) observed changes in the quantity gonadotropic hormone in the urine and blood of tients suffering from nausea and vomiting. No ecific pathological lesion has been noted, and the st-mortem findings (associated with hyperemesis avidarum) are consistent with what might be expected the end-result of protracted vomiting and lack of food d fluid (Sheehan 1939). Psychological factors have also en considered, and Weiss and English (1943) express e following view:

> “ A conscious or unconscious wish not to become egnant: if the unconscious aversion is masked by a nscious desire to become pregnant, sickness is likely be severe: an unconscious belief that a sin has been mmitted: childhood fantasies suggest that the preg- ncy has taken place by way of the gastro-intestinal act and the unconscious desire to be rid of the fœtus nceives its expulsion in the same way.”

This opinion, however, was not borne out by statistical alysis of the conscious wish to be pregnant or not egnant in my series of 100 patients; nor does it explain e sickness variation in a sequence of pregnancies in e same woman. It savours more of armchair deduction the abstract than of clinical observation (see table II). A discussion of the ætiology of the nausea and vomiting pregnancy may most conveniently be arranged in rms of Halliday's (1943) formulation of ætiological inciples.

ÆTIOLOGY OF ONSET

The Person.—What kind of woman on becoming egnant develops nausea and vomiting? Relevant rsonality characteristics are disturbed coital function- g (acquired in adult life, often short-acting, may vary om pregnancy to pregnancy); undue mother attach- ent (usually acquired in adolescence, tends to decrease); d, less often, previous dyspepsia (usually dates from ildhood and remains fixed).

Environment.—Why does a pregnant woman develop omiting when she does? Among relevant environmental ctors are the physical propinquity of the mother and sband, the husband's behaviour as a lover, and the equency of his coital demands.

Mechanism.—Why does a pregnant woman's ailment ke the form of nausea and vomiting? A psycho- matic approach suggests that the nausea and vomiting ay represent the physical expression of an emotional nstellation in which disgust is predominant. It also ggests that the biochemical changes associated with egnancy probably lower the threshold of the physical pression of a latent or subconscious disgust; hence, hen the ovum dies or the fœtus is removed, the thres- old to physical expression is again raised and vomiting ases. In other words, pregnancy serves as a trigger. hese suggestions are consistent with the absence of y proved toxin, the probable change of hormonal cretions accompanying subconscious emotional activity s well as pregnancy), and the absence of any specific thological lesion.

ÆTIOLOGY OF NATURAL RECOVERY

Why does the patient recover without treatment? omen with nausea and vomiting of pregnancy may cover spontaneously in a few weeks when the illness is mild. In more severe cases removal from the proximity of the mother or the husband is often followed by rapid improvement. A study of successive pregnancies in the same woman shows how the presence or absence of vomiting in the various pregnancies is usually governed by the presence or absence of the operative environmental factors already described.

ÆTIOLOGICAL PRINCIPLE OF THE PREVALENCE

The theory that nausea and vomiting is an expression of the emotional life, especially of a heightened sense of disgust, covers the known facts in terms of person and environment (biological ætiology), the known facts in terms of the bodily organs and functions involved (ætiology of mechanism), and the known facts of the ætiology of natural recovery. Further, it can be shown that it does not conflict with the principle of “prevalence,” which is that if the incidence of a disease does not conform with what we have inferred concerning its ætiology, then our inferences are faulty, partial, or erroneous (Halliday 1943).

The published work shows that the incidence of the syndrome is not primarily related to physical factors of environment, such as climate or diet, but is clearly associated with the psychosocial set-up sometimes called western civilisation. Thus the incidence is low among Eskimos and native African tribes (Dieckmann 1938). In oriental countries, except industrialised Japan (Hall 1943), hyperemesis gravidarum is practically unknown. It is common in modern capitalist industrial countries, such as western Europe and America, and is more prevalent in urban than in rural areas. Dieckmann, investigating the incidence of hyperemesis in various climates, also notes that it was relatively rare in Germany during the war of 1914–18, but that a well-marked increase took place in the following years. The ætiology of this change in prevalence is complex, but it could be attributed to the different psychosocial environment prevailing in the war years contrasted with the post-war years, notably the separation of husband and wife during the years of combat (see above).

A further interesting fact, remarked on by veterinary surgeons and farmers, is the absence of vomiting in pregnant animals. Though the physical accompaniments of pregnancy in many animals closely parallel those in woman, the female animal is free from a sense of shame in the presence of the mother, nor does she submit to coitus from a sense of duty to the male.

Therapeutic Inferences

As in most illnesses, ætiological insight emphasises the importance of prevention rather than cure—e.g., the need for more knowledgeable upbringing of the young, reasons why a woman should marry in accordance with her instincts rather than to attain social position, and the necessity for marital education in the newly married. Nevertheless the results of this inquiry into ætiology have definite therapeutic implications. Knowledge of the ætiological importance of mother attachment, disturbed coital functioning, and the frequency of undesired coitus enables the doctor to focus his inquiries on those characteristics of the patient's personality and her life situation which are of ætiological relevance. Patients with severe nausea and vomiting in pregnancy have usually endured a good deal of mental anguish, and, because of the delicacy of the problems involved, rarely make confidants spontaneously. There are few of them who cannot be materially helped by bringing to light their particular difficulties.

When a history of previous dyspepsia was the only factor present, the degree of sickness was usually a constant in all pregnancies in the same woman. Though it might persist for a few months, it was rarely severe. On only two occasions, where the onset was traced to events at the unusually late age of between 12 and 14 years, was I able to discover significant factors or to influence the normal course of the illness. Where a strong mother tie exists, this can easily be discussed freely, provided a reasonable amount of tact is used. Most women are not upset to learn that it is neither virtuous nor wise to be bound indefinitely by their mother's apron-strings. Where previous undesired coitus is realised to be a factor, this can be discussed with both husband and wife, He is inevitably unaware of the possible significance this may have in relation to the sickness of his wife.

Although many of these talks were instigated by me in pursuance of an idea and to obtain statistical data, the underlying and inspiring purpose was to bring about cessation of sickness, and, through change of habit in the life situation, to prevent sickness in future pregnancies. Each patient should be studied as an individual. Treatment in any particular case depends on the particular findings. The approach must be sympathetic, tactful, unrushed, and in privacy. If success is to be achieved, the patient, besides replying to question and unburdening herself of her affairs, should receive an acceptable explanation capable of convincing her that the factors discovered by inquiry were really the cause of her vomiting. The second interpretation given above on the significance of mother attachment as a sickness-producing factor is much more readily understood than the first. In my experience no woman, however dull, has the slightest difficulty in believing that the effect of frequent undesired intercourse is cumulative in the subconscious and leads to a personality change which manifests itself as an increased tendency to vomit. It may be necessary to remove the patient from the propinquity of the mother or husband. She may be benefited by the knowledge that the question is being taken up with her husband. As a general rule several factors—e.g., mother attachment and frigidity—are found in the more severe cases of vomiting.

After such discussions the improvement is often dramatic, especially among recently married women. An older woman, however, who has been frigid from the beginning—e.g., a multipara, perhaps pregnant for the twelfth time—may present more difficulty. In such a woman the disgust may be so chronic and deep-seated that it finds physical expression even between her pregnancies in the syndrome of "rejection dyspepsia," as already described.

It is not easy to detail statistically the results of treatment in a condition so variable as the sickness of pregnancy; hence only 4 of the more severe cases will be considered, 3 of them briefly. All 4 women were completely frigid—i.e., at no time in their lives had there been sex interest—and all showed also mother attachment: 3 of them of the second degree and 1 of the first degree. When first attended 2 of the patients, besides being violently sick, were bleeding slightly from the uterus and having mild pains. Both were between seven and nine weeks' pregnant, both improved much in two days, and both stopped vomiting within two weeks. One remained well, but the second, who was living with her mother, had two severe recurrences, one accompanied by an attack of pyelitis, in the later months of pregnancy. Each recurrence had followed a domestic crisis which required further investigation and treatment. The third (table II, case 6) continued to have nausea and vomiting until she entered labour at the 35th week. Although vomiting appeared to diminish in intensity, treatment was less successful than in any other case in the series, and she was the only patient in whom pregnancy did not reach full term. The fourth patient, aged 27, in her second pregnancy (one of the 2 cases of albuminuria), is described in greater detail.

Her mother approached me through a neighbour whom I had treated during pregnancy. The patient was in hospital with the diagnosis of toxæmia of pregnancy. Next day she was conveyed home by ambulance against stern advice. She was visited once only. Half an hour was occupied in obtaining the following story and in making the psychopathological interpretations and suggestions thought necessary.

Life Situation and Emotions.—Her husband served in the merchant navy. The marriage took place during a period of leave, eighteen months previously. Conception took place during his fourth spell ashore. She was devoted to and dependent on her mother, with whom she lived when her husband was at sea and whom she visited, forenoon and evening, during his periods of leave. She said she was very fond of her husband but felt revolted and disgusted when physical relationship took place, which was frequently when he was at home. Each time he left her to resume his hazardous duty she was filled with remorse and guilt because she had so little of herself to give him and a sensation of terror lest, as a result of a torpedo, she might never have another chance of seeing him. About two weeks after conception and before she was aware of pregnancy, her doctor advised a rest from her work in a munitions factory and certified her as unfit owing to hyperthyroidism. Two weeks later vomiting began. When three months' pregnant, she was admitted to the maternity hospital, in which she was detained for four months. During this period there was daily vomiting, intermittent albuminuria, and a moderate rise in blood-pressure.

Progress.—After a discussion of the relevant problems, vomiting ceased in 24 hours. Appetite returned. She was out of bed in a few days, and out of doors a week later. When the hospital almoner called at the end of the second week she was out shopping, having gained a stone in weight. When the patient called at my consulting-rooms three weeks after her homecoming, her urine was free from albumin and her blood-pressure was 125/80, at which level it remained until her uneventful delivery.

"Psychosomatic" and "Psychoneurotic"

The psychosomatic concept has been the subject of much confused thinking, and perhaps in no field of medicine is there a greater need for the "integration of medicine," advocated with enviable artistry by Walshe (1945). The psyche-soma interrelationship has been influenced by Freudian beliefs and analogy, and indeed many writers apply the same principles to "psychogenic" somatic disorders as were found useful in the study of psychoneurosis. Briefly, these principles suppose that it is determined either genetically or in babyhood or in childhood *how* the patient will break down in health, should his later life stresses be too great. Adult difficulties are lumped together as "anxiety" and are regarded merely as the factors which precipitate the breakdown in point of time. In other words, whether the stress is caused by flying a bomber over enemy territory or by marrying a frigid wife, the form taken by the resulting illness will be the same unless experiences before or shortly after birth determined otherwise. Others again still speak of an illness as being either physical or psychogenic. For them "psychosomatic" is a euphemism for psychoneurotic. Thus, though they have come to use new words, they continue to think in terms of the outmoded classification of functional or organic.

Such views are alien to those expressed in this paper which postulate a psychosomatic disease or disorder to be a specific physiological response to a particular type of emotion capable of being incorporated into the personality at any age. The persistence of the disorder is determined by the intensity and frequency of the causal emotion and the age when it is experienced. For example:

(1) *Coronary thrombosis* has been called by some the doctors' disease. The high incidence of this disorder among doctors is surely not because they are the subject of any special hereditary traits, or suffered from particular psychological traumata in childhood, or because they feed on an imperfect diet or live in damp houses, or because their physical or even intellectual output is unduly high, but rather because of the emotional accompaniments

their duties—factors such as hurry and tension, undue sponsibility, and fear of a diagnostic error or unkindly dgment, with possible repercussions on their means livelihood.

(2) *Enlarged Prostate.*—The prostate is normally tivated by erotic emotions mediated by endocrine, otably gonadal, activity. Few would deny that some rm of over- or mal-activity is responsible for the timate enlargement, a view supported by the freedom the eunuch from both the predominant emotion and ormone and from enlarged prostate.

These two diseases, unquestionably physical, and sulting from the repetitive effect of specific emotional onstellations in adult life, appear to fall into the psycho-omatic category. Neither need be associated with sychoneurosis.

It is certain that "disgust-shame" factors may find heir way into the subconscious through life experiences ther than those expressed by the conceptions "previous yspepsia," "mother attachment," and "disturbed exual functioning." For instance, it is probable that woman who was an inhabitant of a besieged city and as so unfortunate as to be reduced to a diet of cats, ats, and mice, would suffer from vomiting if she became egnant soon afterwards. On the other hand, there as no evidence of a rise in either the prevalence or the verity of the nausea and vomiting of pregnancy mong the blitzed citizens of London and such intensely ombed areas, although there was an increase in the ncidence of psychoneurosis. Some of the most highly eurotic women in the series were free from nausea and omiting, in the absence of the described causal factors. The sickness of pregnancy can be defined as a psycho-omatic reaction. This behaviour pattern is separate nd distinct from the emotional quality popularly con-eived by the expression "psychoneurotic."

From a survey of a very much larger series than the 00 women who form the basis of this paper, other factors ppeared to be ætiologically relevant in a small ercentage of cases. Thus, the syndrome developed in vomen with strong aggressive feelings towards the father; n women born in humble circumstances whose life was lominated by an attempt to compensate in appropriate ocial aspirations; in women whose early life had been narred by lack of love and affection, and whose sexual needs after marriage seemed insatiable; and in women vith an inability to accept the animal functions of the body, including secretions and excretions, birth, love, and leath.

FINAL NOTE

Although the importance of sex as a factor in the nausea and vomiting of pregnancy has hitherto escaped the attention of clinical and scientific workers, it has been sensed by non-medical observers. Two fictional works written by well-known lady novelists were recently brought to my notice. In the first (Seymour 1928) the absence of sickness in a pregnancy following an ideal love union was strongly emphasised, while in the second (Ertz 1943) equal emphasis was laid on the persistence of sickness throughout a pregnancy where the wife was not in love with the husband.

Summary

A clinical and statistical investigation of the nausea and vomiting of pregnancy shows that the syndrome may be the physiological expression of an underlying emotional state which may be equated with that of disgust. This view has the merit of covering all the known facts, including those relating to the prevalence of the disorder.

Relevant ætiological characteristics of the personality are disturbed coital functioning, undue mother attachment, and, to a lesser extent, a history of previous dyspepsia.

Relevant factors in the life situation are the frequency of undesired coitus and the physical propinquity of the mother.

These conclusions have important implications for therapy. They indicate the need to supplement physical examination of the patient with investigation into her emotions and life situation.

This investigation owes much to the inspiration and illumination provided by the papers of Dr. J. L. Halliday on psychosomatic medicine. During its preparation I was personally indebted to Dr. G. R. Anderson for useful suggestions and to Mr. J. M. Ross for inquiring into the incidence of sickness in pregnant animals.

REFERENCES

Bandstrup, E. (1939) *J. Obstet. Gynæc.* 46, 700.
Dieckmann, W. J. (1938) *Amer. J. Obstet. Gynec.* 36, 623.
Ertz, S. (1943) Anger in the Skies, London.
Hall, M. B. (1943) *Amer. J. med. Sci.* 205, 869.
Halliday, J. L. (1943) *Brit. J. med. Psychol.* 19, 367.
Kemp, W. N. (1933) *Canad. med. Ass. J.* 28, 389.
Kotz, J., Kaufman, M. S. (1940) *Amer. J. Obstet. Gynec.* 39, 449.
Schoeneck, F. J. (1942) *Ibid,* 43, 308.
Seymour, B. K. (1928) Youth Rides Out, London.
Sheehan, H. L. (1939) *J. Obstet. Gynæc.* 46, 685.
Shute, E. (1941) *Amer. J. Obstet. Gynec.* 42, 490.
Walshe, F. M. R. (1945) *Brit. med. J.* i, 723.
Weinstein, B. B., Mitchell, G. J., Sustendal, G. F. (1943) *Amer. J. Obstet. Gynec.* 46, 283.
Weiss, E., English, O. S. (1943) Psychosomatic Medicine, Philadelphia, p. 614
Willis, R. S. et al. (1942) *Amer. J. Obstet. Gynec.* 44, 265.

CALF PLASMA OR SERUM FOR TRANSFUSION

J. M. Massons
M.D. Barcelona

From the Institute of Medical Research in Barcelona University

The costly business of collecting human blood for transfusion, the difficulties of storing whole blood, and various disadvantages (such as time lost in grouping) in blood-transfusion have led many researchers to seek a substitute for blood. But all have had serious drawbacks.

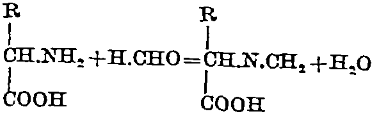
Various attempts have been made to remove the anaphylactogenic properties of animal plasma or serum so as to make it safe for transfusion.

Rosenau and Anderson (1906) used heat and chemical agents, and Doladilhe (1937) tried eliminating a globulin fraction by dialysis. Brodin and Saint-Girons in 1918 successfully injected 500 c.cm. of horse serum into a man, and later (Brodin and Saint-Girons 1939) suggested that transfusion with horse serum might be useful. Kremen et al. (1942) concluded after many attempts that the use of calf plasma was contra-indicated. The use of blood of a lower animal for transfusion in man goes back to 1662 (*Lancet* 1939).

I thought that formol might act on serum anaphylactogens as it did on bacterial toxins and animal venoms, and I found that horse serum treated with formol lost its anaphylactogenic properties after being incubated for some days at 40–45° C (104–113° F) or for a shorter time at a higher temperature. Moreover, formol, in the necessary concentration, at 80–100° C (176–212° F) acted as an antiseptic.

Several workers had already reported the anti-anaphylactic properties of formol. Kendall (cited by Re 1940) and others had shown its inhibiting effect on uterine and intestinal contractions with the Schultz-Dale technique.

The action of formol on amino-acids and proteins has long been known, and Sörensen (1908), using the reaction described by Schiff (1899, 1901)—



$$\underset{\displaystyle\text{COOH}}{\overset{\displaystyle\text{R}}{\text{CH}}}.\text{NH}_2 + \text{H.CHO} = \underset{\displaystyle\text{COOH}}{\overset{\displaystyle\text{R}}{\text{CH}}}.\text{N.CH}_2 + \text{H}_2\text{O}$$

—was able to determine the amino-acids, reckoning on pH deviation resulting from the neutralisation of the amino groups. It is probably this reaction that is responsible for the removal of the anaphylactogenic properties of the proteins, although other substances—e.g., ketene (CH=C=O)—which react with the proteins and block the amino groups, destroy the anaphylactogenic power of animal sera (Goldie and Sandor 1937).

Likewise Zipf and Bartscher (cited by Otto et al. 1938) and Platonov (1940) believe that formol suppresses anaphylaxis by neutralising the biogen amines, especially histamine.

PREPARATION AND PROPERTIES OF CALF PLASMA

To the citrated bovine plasma separated by centrifugation—*for large amounts I use a De Laval blood-separator*—formol is added until a concentration of 0·35% is reached. Five minutes later, to correct the acid deviation resulting from the neutralisation of the amino groups, ammonia is added until a concentration of 0·01% is reached. To avoid further gelification, 0·9% saline or 5% dextrose or doubly distilled water is added until a concentration of proteins 3·7–4·0% is reached. The plasma is then heated over steam and, when it begins to boil at 100° C (212° F), is left to cool to 50° C (122° F). It is filtered to get rid of little clots and small fibrin particles and then put into glass ampoules and tyndallised.

The plasma so treated undergoes slight discoloration and acquires a certain opalescence when viewed against a dark background.

This procedure causes a slight increase in the freezing-point (from −0·48 to −0·56° C) and an important increase in the viscosity. No noteworthy variation is found in the albumin-globulin ratio and in the non-protein nitrogen. Studies are in progress to explain these apparently contradictory changes.

The plasma can be preserved indefinitely at ordinary temperature; already I have samples three years old. It does not agglutinate or hæmolyse human red blood corpuscles. I have never seen any toxic effects due to an excess of formol, probably because part of it combines with the proteins, part with ammonia, and part evaporates on boiling.

The action of formol is the important factor in my method; the heat is only a means to accelerate the reaction and to ensure perfect sterilisation. The truth of this seems to be supported by my above-mentioned experience with the action of formol at 40–45° C and by the fact that in those cases in which the anaphylactogens are destroyed by heat, as in the method of Lenggenhager (1940), new antigenic properties are acquired which *produce anaphylaxis in previously sensitised animals* according to Frimberger (cited by Lang and Schwiegk 1943).

The ammonia is not absolutely necessary; but, if it is not added, the plasma becomes cloudy and its injection is painful. Sodium hydroxide can be used instead of ammonia.

The plasma must be free from hæmoglobin, and as far as possible from lipoids.

By this method the anaphylactogenic properties of the calf plasma are destroyed by physicochemical means whereby the antigens are altered without destroying the physicochemical properties of the plasma.

Studies still unfinished suggest that the degree of destruction of the antigenic power varies according to the level of temperature and the time the formol is acting. Thus at 80° C the formolated plasma changes its colour, as already stated, but retains slight antigenic properties: when repeatedly injected into a rabbit it induces a low titre of precipitins, and it will kill a guineapig with an anaphylactic shock. On the other hand, heated to 100° C, or better to 110° C, it will no longer produce precipitins or anaphylaxis.

EXPERIMENTS

My experiments were done on 70 guineapigs, 40 rabbits, and 2 dogs. I chose young males because Duran-Reynals (1919), Lumière (1933), and Moreira (1925) have shown that pregnant females are resistant towards experimental anaphylaxis.

In an attempt to sensitise the animals, preliminary injections were given to the guineapigs subcutaneously on three successive days or else on alternate days and t test injection intraperitoneally on 10 guineapigs a intracardially in the remaining 40. In the rabbits t preliminary injections were given in the same way in the guineapigs in 10 cases, but in the remaining I used Grove's technique (Sanchez-Cuenca 19 first injection intravenous, second subcutaneous 4-5 later, and test injection intravenous 21 days after t initial dose.

To make sure that the prepared calf plasma (P.C. contained neither complete nor incomplete antigen I carried out the following experiments.

In 40 guineapigs, 10 rabbits, and 2 dogs I gave prel injections of P.C.P. followed by a test injection of P.C.P. *10 other guineapigs and 10 other rabbits I gave* p injections of P.C.P. followed by a test injection of fresh plasm In neither of these sets of experiments was any anaphyla observed. Therefore the P.C.P. contained no antigen.

I next gave 20 other guineapigs and 20 other rabb preliminary injections of fresh plasma, and in order to be s of their sensitisation state I produced in 2 animals a typic anaphylactic shock by injecting them with fresh plasma. The rest of *the animals were treated* with a test injection of P.C.P.; no anaphylactic shock was observed.

In the next experiment I gave preliminary injections of P.C.P. to 8 virgin doe guineapigs and perfused the uterus of each. When P.C.P. was added to the perfusing liquid, no alteration of uterine contractions was observed; but, whe antigen was added, the uterus developed tetany.

My next step proved that P.C.P. 10–20 c.cm. injected intravenously in rabbits had no effect equivalent to that of prote shock.

There followed the investigation of the supposed toxicit of serum proteins by injecting rabbits and dogs, without an harmful result, with quantities of P.C.P. equivalent to a transfusion of 3–5 litres in an adult man weighing 65 kg. (abo 143 lb.).

To test how long P.C.P. remained in the circulatio I bled dogs and measured the blood-pressure (B.P.) an the amount of hæmoglobin, having first taken spec precautions to discount the contraction of liver and spleen by which dogs (but not man) react to hæmorrhage Obviously the injection of liquid into the circulation o a dog with low B.P. will raise the B.P. and reduce the le of hæmoglobin. Conversely, when such injected liq leaves the circulation, the B.P. will fall again and th hæmoglobin become more concentrated.

In contrast to an injection of saline, which produc a merely temporary effect, an injection of P.C.P. maintained its effect for twelve hours in spite of lo continued anæsthesia and small repeated bleedings to determine the amount of hæmoglobin.

I was now ready to experiment on man. I began b giving gradually increasing doses of P.C.P. intravenou to 25 sick or convalescent typhus patients. The init dose was 10 c.cm., and subsequent doses were work up to 300 c.cm. In no case was there any pyrog reaction or the slightest sign of intolerance. In a thousand injections of 100–1000 c.cm., there was never an suspicion of urticaria, which is the most constant sign of serum sickness, appearing in 90% of patients su mitted to large doses of serum given intravenou (Sanchez-Cuenca 1942).

Further experiments led me to conclude that m patients did not become sensitised to calf serum, a matter of importance in obviating future allergy t veal or beef as a food.

THERAPY WITH CALF PLASMA

P.C.P. is given intravenously, somewhat tepid, an preferably slowly; but there is no objection to giving it if necessary, in the same way as a blood-transfusio A few patients complained of transient pain in the vein during the injection of the first 50 c.cm. or so. Apart from that, the only thing to be feared is a rigor after the injection (I had 30 cases in 1000 injections), but with

mproved technique which is being introduced even
risk should disappear.

reated these groups of cases :

ost-hæmorrhagic anæmia, shock from wounds or ileus—
i.e., cases of surgical urgency.
ypoproteinæmias—e.g., lipoid nephrosis, famine œdema,
hepatic cirrhosis.
ehydrated infants, alimentary toxæmia, and wasting.

1 about 200 cases of surgical urgency the results were
arkably good, especially as a prophylactic against
k. For hypoproteinæmia 8 cases of hepatic cirrhosis
e been treated with P.C.P. with results equal to those
ined with human plasma. In the third group of
s Professor Ramos and his co-workers have treated
cases of alimentary toxæmia and a few cases of
ting with P.C.P. with excellent results.

ADVANTAGES OF USING CALF PLASMA

he following are the chief advantages of using P.C.P.
ompared with human plasma :

) The preparation and storage are more economical.
) The plasma can be stored for over a year without
riorating.
) There is no need for refrigeration or any other special
litioning of the plasma.
) Ease of transport.
) P.C.P. can be stored in shops, or in regimental casualty
s in war-time.
) No loss of time in grouping the blood of a wounded man.
) P.C.P. can be injected without any risk. Even in heart-
re it can be given safely, provided that the rate of 2 g.
kg. of body-weight per hour is not exceeded. The only
bt may concern the content of sodium citrate used as an
coagulant ; but this danger has been exaggerated in the
, and the greatest amount given in large doses of P.C.P.
r exceeded 2 g.
) No specialist expert is required to give the transfusion.
body who can give an intravenous injection can administer
P. If intravenous injection is impracticable—e.g., in
ity, peripheral vasoconstriction of shock, previous ampu-
on, extensive burns, and in infants—the plasma can be
n by sternal puncture. The sternal marrow can easily
orb large quantities of fluid. In infants the head of the
a can be used instead of the sternum. This plasma does
harm bone-marrow. Thus, in a moribund infant it was
cted to test its effects, if any, on bone-marrow, and at the
opsy a day later no alteration of the bone-marrow was
nd at the site of injection.
9) Its action most nearly approaches that of blood.

SUMMARY

description is given of the preparation and properties
calf plasma as a substitute for human plasma in
od-transfusion.

xperiments are described which showed that calf
sma so prepared contained no antigens, and that its
ct was not merely temporary like that of saline.

repared calf plasma has been used successfully in
treatment of three types of case : hæmorrhage and
ck, hypoproteinæmia, and dehydration.

wish to thank Prof. F. Garcia-Valdecasas for his friendly
and helpful criticism during my research.

REFERENCES

lin, P., Saint-Girons, F. (1939) *Bull. Soc. méd. Hôp. Paris*, 55, 1224.
adilhe, M. (1937) *C.R. Acad. Sci., Paris*, 204, 301.
an-Reynals, F. (1919) *C.R. Soc. Biol. Paris*, 82, 830.
lle, H., Sandor, G. (1937) *Ibid*, 126, 291.
men, A. J., Hall, H., Koschnitzke, H. K., Stevens, B., Wangen-
steen, O. H. (1942) *Surgery*, 11, 333.
cet (1939) ii, 792.
g, K., Schwiegk, H. (1943) *Wien. klin. Wschr.* ii, 579.
genhager, K. (1940) *Zbl. Chir.* 67, 1961.
ière, A. (1935) Colloïdes et micelloïdes, Paris, p. 367.
eira, M. da S. (1925) *C.R. Soc. Biol. Paris*, 93, 1543.
, R., Felix, K., Laibach, F. (1938) Chemie und Physiologie des
Eiweisses, Dresden, p. 83.
onov (1940) *Z. Mikrobiol.* 119, 658.
P. M. (1940) Acidos aminados, Buenos Aires.
nau, M. J., Anderson, J. F. (1906) *Bull. Hyg. Lab.* no. 29.
hez-Cuenca, B. (1942) Anafilaxia y alergia, Madrid.
, H. (1899) *Ann. Chem.* 310, 25 ; (1901) *Ibid*, 319, 59 and 287.
nsen, S. P. L. (1908) *Biochem. Z.* 7, 45.

TYPHOID CARRIERS

TREATED WITH PENICILLIN AND SULPHATHIAZOLE

C. H. Comerford
M.D. Dubl., D.P.H., D.P.M.
DEPUTY MEDICAL SUPERINTENDENT

H. Richmond
M.B. Birm.
ASSISTANT MEDICAL OFFICER

BEXLEY L.C.C. HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

W. W. Kay
M.B., M.Sc. Manc., F.R.I.C.
PATHOLOGIST, EPSOM PATHOLOGICAL LABORATORY, LONDON COUNTY MENTAL HEALTH SERVICES

Bigger,[1] in reporting his observations on the synergic action of penicillin and sulphathiazole on *Bact. typhosum* in vitro, made suggestions for treating typhoid fever with these drugs.

In February, 1946, a patient in Bexley Hospital contracted typhoid fever. *Bact. typhosum*, phage type D_1, was isolated from blood culture on the seventh day of the disease. Sulphathiazole 1 g. four-hourly was ineffective. On the twenty-eighth day of the disease the patient's condition was critical ; her temperature was 103·4° F and her pulse-rate 110 per min. A limited amount of penicillin was then available, and treatment with this combined with sulphathiazole was begun. Sulphathiazole 1 g. orally, and about 16,000 units of penicillin intramuscularly, were given every four hours, a total of 387,000 units of penicillin being given in four days. On the thirty-second day of the disease, when this treatment ceased, the temperature had become normal, and remained so except for rises to 99° F on three days. The pulse-rate also fell. At no time was *Bact. typhosum* isolated from the urine or fæces. The impressive clinical improvement coinciding with the administration of so small an amount of penicillin decided us to try the full doses suggested by Bigger, in the treatment of typhoid carriers. An account is now given of the results obtained in two well-established carriers, both of whom regularly excreted *Bact. typhosum*, phage type D_1, in their fæces.

Dosage.—An initial dose of sulphathiazole 2 g. by mouth was followed by 1 g. four-hourly. Penicillin, in doses of approximately 500,000 units dissolved in 10 c.cm. of sterile water, was given intramuscularly at the same time. Treatment continued for eight days in the first case, and seven days in the second.

Bacteriological Investigations.—For a month before treatment and ever since treatment, six samples of every stool passed have been examined, usually one sample in the Bexley laboratory and five at the Epsom Pathological Laboratory. Direct plating was carried out on MacConkey and Wilson and Blair plates, and portions of each sample were passed through enrichment media, either brilliant green in peptone water in three concentrations (1/145,000, 1/250,000, and 1/400,000) and tetrathionate broth followed by plating on MacConkey, or selenite F followed by plating on Wilson and Blair and desoxycholate agar. Magnesium sulphate was given every second or third night to secure regular evacuations. Two samples of a morning specimen of urine were examined by direct plating, one in each laboratory.

Serological Investigations.—Agglutinations to typhoid O and Vi were carried out before treatment and at monthly intervals thereafter.

CASE-RECORDS

Case 1.—A woman, aged 50, admitted to Bexley Hospital on May 17, 1932, had two prophylactic inoculations of T.A.B. vaccine in December, 1940.

---

1. Bigger, J. W. *Lancet*, 1946, i, 81.

TABLE I—TYPHOID-VI AGGLUTINATION TITRES

Date	Case 1 (treatment ended April 23, 1946)						Case 2 (treatment ended May 6, 1946)					
	1/5	1/10	1/20	1/40	1/80	1/160	1/5	1/10	1/20	1/40	1/80	1/16
April 4, 1946 ..	+ + ±	+ +	+	±	−	−	+ + +	+ + +	+ +	+ ±	−	-
May 2, „ ..	+ + +	+ + ±	+ ±	+	±	−	+ + +	+ + +	+ + ±	+ ±	(±)	-
June 3, „ ..	+ + +	+ + +	+	±	−	−	+ + +	+ + +	+ + ±	±	−	-
July 4, „ ..	+	±	±	−	−	−	+ + +	+ +	+	−	−	-
Aug. 8, „ ..	+	(±)	−	−	−	−	±	−	−	−	−	-

−, no agglutination. (±), ±, +, + ±, + +, + + ±, + + +, *increasing degrees of agglutination.*

In September, 1943, in the course of a survey for carriers, her serum gave the following agglutinations (North-western Group Laboratory, L.C.C.): *Bact. typhosum* H 1/320; *Bact. typhosum* O 1/160; and *Bact. typhosum* Vi 1/40.

Typhoid bacilli were isolated from the fæces on four occasions in September and October. Agglutination tests, repeated in August, 1944, gave the following results: *Bact. typhosum* H 1/125; *Bact. typhosum* O 1/125; *Bact. typhosum* Vi 1/2; and against her own organism 1/250. *Bact. typhosum*, phage type D_1, was isolated frequently in February, March, April, and May, 1945.

Cholecystectomy was performed in June, 1945, the patient making a good recovery. Typhoid bacilli were grown from the gall-bladder removed at operation, and after operation the organism was again isolated from the fæces on six occasions in June and July, with one negative result intervening.

During the month's observation before treatment with penicillin and sulphathiazole the patient ran an irregular temperature ranging between 100° and 97° F. This subsided on the third day of treatment, since when the temperature has remained normal. Typhoid bacilli were isolated from the stools passed on thirteen occasions (March 18, 19, 20, April 1, 2, 3, 4, 5, 8, 9, 11, 12, and 15), but not from the five stools passed on March 21, 22, 25 (2 stools), and April 10. Stools were not passed on the days not mentioned.

Treatment was started at 6 P.M. on April 15 and continued for eight complete days, a total of 24,800,000 units of penicillin and 49 g. of sulphathiazole being given. No local or constitutional ill effects attended the treatment. After the second day of treatment typhoid bacilli ceased to be isolated from the stools, and for over 130 days bacteriological examinations of both stools and urine for this organism have been consistently negative.

CASE 2.—A woman, aged 69, admitted to Bexley Hospital on transfer from Canterbury Mental Hospital in April, 1941, had no history of typhoid infection or T.A.B. inoculation, but in April and May, 1945, she had a mild pyrexia for twenty-eight days, which began seven days after being in contact with case 1. In retrospect it now appears that this may have been a mild attack of typhoid fever. On March 26, 1946, on bacteriological examination of the fæces following a serological survey, *Bact. typhosum*, phage type D_1, was isolated.

During the month's observation before treatment *Bact. typhosum* was isolated from the fæces passed on twenty occasions (March 31, April 1, 3, 4, 5, 9, 11, 12, 15, 16, 17, 18, 20, 23, 24, 25, 26, 27, 28, and 29). Stools were not passed on the intervening days. Thus, every stool passed gave a growth of *Bact. typhosum*. *Bact. typhosum* was not isolated on any occasion from the urine.

Treatment with penicillin and sulphathiazole was started on April 29 and continued until the morning of the fifth day, when sulphathiazole by mouth was stopped owing to persistent vomiting and 1 g. of sulphapyridine was given intramuscularly for six successive doses. As the vomiting then ceased, sulphathiazole was resumed orally without further ill effect. A total of 21,420,000 units of penicillin, 36 g. of sulphathiazole, and 6 g. of sulphapyridine were given.

Apart from the bout of vomiting, presumably due to the sulphathiazole, the treatment had no constitutional ill effect, nor was there any local irritation at the site of the injections. *Bact. typhosum* was isolated from the fæces on the second day of treatment, since when for over 116 days intensive bacteriological examination of the morning urine and of every stool passed has failed to isolate t organism.

Agglutination Reactions.—Neither patient showed a fall in the agglutination titres for typhoid H and O, b 8–10 weeks after treatment both showed a definite reduction in typhoid-Vi agglutination titres and a furth reduction after another four weeks (see table I).

DISCUSSION

It is noteworthy that, in both cases reported, *Bact. typhosum* was not isolated from the fæces after the second day of treatment, with the same intensive bacteriological methods as gave positive results on almost every stool before treatment. It seems reasonable to infer that the synergic action of penicillin and sulphathiazole has at least inhibited the growth of *Bact. typhosu* in the alimentary tracts of both these patients, thou a much more extended period of observation is necessary before a safe conclusion can be reached that th carrier state has been cured. Case 1 continued to excre typhoid organisms after cholecystectomy, a not unusu occurrence.

The typhoid H and O agglutination titres after treatment showed no reduction. A much longer interva however, is required before they can reasonably be expected to show a diminution associated with th disappearance of the typhoid organism from the bod of the patient. Nevertheless the reduction of the V titre two months after treatment may be interpreted a indicating that the activity of the organism has cease in these two patients.

In both cases the organism belonged to phage typ D_1, a type not included in those investigated by Bigge

TABLE II—APPEARANCE OF BROTH CULTURES OF *Bact. typhos* PHAGE TYPE D_1, AFTER 48 HOURS' INCUBATION (STANDA INOCULUM)

Tube no.	Penicillin (units per ml.)	Sulphathiazole (mg. per 100 ml.)	Case 1	Case 2
1	8	0	(±)	(±)
2	4	0	±	±
3	2	0	+	±
4	1	0	+ ±	+ ±
5	0	0	+ +	+ +
6	8	10	−	−
7	4	10	(±)	±
8	2	10	±	±
9	1	10	±	±
10	0	10	±	±
11	0	5	±	±
12	0	2·5	+	+
13	0	1·25	+ ±	+ ±

−, broth clear. (±), ±, +, + ±, + +, increasing degrees o turbidity. Both tubes 6 remained clear after 96 hours *incubation.*

he laboratory the organisms were tested for peni- and sulphathiazole sensitivity by the methods ribed in Bigger's paper, and the results are given ıble II.

is evident, then, that our organisms of phage type exhibit in-vitro sensitivity to sulphathiazole and cillin mixtures similar to those of Bigger's series, it seems reasonable to infer that this sensitivity lso found in the living patient in the two cases stigated.

he bacteriological results obtained in these cases e the question of treating other bacillary infestations he alimentary tract by this method. Should the ergic action of penicillin and sulphathiazole, or other honamide, be as effective in treating dysentery iers as it appears to be in typhoid carriers, the blem of dysentery, in mental hospitals in particular, uld be brought much nearer to an adequate ıtion.

ur experience with these patients shows that the ıtment can be carried out in relatively non-coöperative ıtal patients, even in those showing, as one of ours , much wasting besides profound mental deterioration.

SUMMARY

wo typhoid carriers, one of whom continued to rete *Bact. typhosum* after cholecystectomy, have n treated with penicillin and sulphathiazole on the s suggested by Bigger[1] for typhoid fever.

ntensive bacteriological examination of every stool er treatment failed to reveal the presence of *Bact. hosum* in them for periods of over 130 days in the case, and over 116 in the other.

wo months after treatment both patients showed uced agglutination titres to typhoid-Vi antigen.

hese results encourage the application of this method treatment in a larger number of typhoid carriers to t its effectiveness.

Ve wish to thank Dr. R. Cruickshank for the early work ried out at the North-western Group Laboratory: Dr. A. ix for the phage typing; Prof. J. W. Bigger for much pful information; Surgeon Captain R. G. Henderson, dical superintendent of the Southern Hospital, Dartford, supplying the penicillin; Dr. L. C. Cook, medical super-endent of Bexley Hospital, for his interest; and our hnical staffs, in particular Mr. C. R. Wright and Miss S. ll, for much painstaking coöperation.

YRIDOXINE (VITAMIN B_6) IN EPILEPSY

A CLINICAL TRIAL

J. TYLOR FOX
A., M.D. Camb., D.P.M.
EDICAL SUPERINTENDENT

GLADYS M. TULLIDGE
M.D. Lond., D.T.M. & H.
ASSISTANT MEDICAL OFFICER

LINGFIELD EPILEPTIC COLONY, SURREY

Harriette Chick and her colleagues (1938) observed at pigs deprived of pyridoxine (vitamin B_6) developed pical epileptic fits, and further (1940) that similar s occurred in rats which had been maintained for long riods on a purified synthetic diet supplemented with d-liver oil, pure vitamin B_1, riboflavine, and purified ast-filtrate factor. In either case the fits could be evented or stopped by the addition of pure pyridoxine the diet, and the authors concluded that they were e to deprivation of this vitamin.

There seemed, therefore, to be some justification a clinical trial of pyridoxine in epilepsy. Eight hoolboys, aged 14–15 years and living in the same home, re selected: 2 of them had petit mal only; 2 had tit mal with occasional grand mal; 2 petit mal with re frequent grand mal; and 2 more numerous fits varying type. The cases were selected because of the ularity of the fits, and previous anticonvulsant medication, whether bromide, phenobarbitone, or phenytoin, was continued throughout the experiment.

Our intention was to give one member of each pair 20 mg. of pyridoxine daily for eight weeks, and then the second member of each pair a similar dose in the following eight weeks. When, however, it became apparent that there was no change in incidence of the fits, the daily dose was increased to 100 mg. and the experiment shortened. In the end, 4 boys had received 100 mg. a day for three weeks, 2 had received 20 mg. a day for four weeks and then 100 mg. a day for four weeks, and 2 only 20 mg. a day for eight weeks. There was no evidence of increase or decrease of fits in any case, nor was any other change, mental or physical, noted in any of the boys. So far as this short series of cases is a guide, it seems unlikely that pyridoxine, even in large doses, would be of value in epilepsy.

We are grateful to Messrs. Vitamins Ltd. for supplying us with large quantities of the vitamin, and to Dr. Audrey Baker, of their research laboratory, for her coöperation and suggestions.

REFERENCES

Chick, H., Macrae, T. F., Martin, A. J. P., Martin, C. J. (1938) *Biochem. J.* 32, 2207.
— El Sadr, M. M., Worden, A. N. (1940), *Ibid*, 34, 595.

PRIMARY DIPHTHERIA OF THE CONJUNCTIVA

REPORT OF TWO CASES

ARCHIBALD R. MILLER
M.D. Glasg., D.P.H.
DIVISIONAL MEDICAL OFFICER,
GLASGOW CORPORATION

DOROTHY E. BLOWER
M.B. Lond.
GENERAL
PRACTITIONER

Two cases of diphtheria affecting the eye only are recorded here, not so much because of the rarity of the condition (Medical Research Council 1930) as because of the rarity of finding the disease being passed from one person to another and affecting the same unusual site in both.

CASE 1.—A girl, aged 3 years, sickened of what was at first thought to be a cold, characterised by nasal discharge and injection of the conjunctivæ. When she was seen by the family doctor four days later the nasal discharge still persisted, and one eye was much inflamed, with very congested conjunctiva, much swollen eyelids, especially the upper one, and a profuse purulent discharge. The child did not appear particularly ill apart from the local condition, and there was no obvious toxicity.

At this stage she was referred to the outpatient department of the Glasgow Eye Infirmary for advice, and there the tentative diagnosis of a diphtheritic infection was made, a swab being taken for bacteriological examination. This was subsequently found to contain corynebacteria, and the child was admitted to a fever hospital while further investigations of the organism were undertaken. These were eventually found to be *C. diphtheriæ* and to be virulent. Although a membrane was reported as being present on the inner aspect of the upper lid its presence was not demonstrated at the fever hospital.

The girl made an uneventful recovery, treatment consisting of antidiphtheritic serum 4000 units and local applications of 'Argyrol' and saline. Repeated cultures from the nasal discharge did not reveal any diphtheritic organisms.

CASE 2.—Four days after the admission of case 1 her brother, aged 5 years, developed a similar condition. The mother, profiting by her previous experience, took him to the doctor at once. The conjunctiva was congested, and the lids were swollen, especially the upper one, but the discharge, though copious, was watery and not purulent. There appeared to be little or no general upset. There was no sign of any discharge or infection elsewhere.

As a precaution, pending further investigation, 4000 units of antidiphtheritic serum was given intramuscularly, and a swab was taken from the eye. The boy was confined to bed. Cultures from the swab revealed the presence of corynebacteria. The patient's local condition appeared now to be improving and his general condition was good. As there

TABLE I—TYPHOID-VI AGGLUTINATION TITRES

Date	Case 1 (treatment ended April 23, 1946)						Case 2 (treatment ended May 6, 1946)				
	1/5	1/10	1/20	1/40	1/80	1/160	1/5	1/10	1/20	1/40	1/80
April 4, 1946 ..	++±	++	+	±	−	−	+++	+++	++	+±	−
May 2, „ ..	+++	++±	+±	+	±	−	+++	+++	++±	+±	(±)
June 3, „ ..	+++	+++	+	±	−	−	+++	+++	++±	±	−
July 4, „ ..	+	±	±	−	−	−	+++	++	+	−	−
Aug. 8, „ ..	+	(±)	−	−	−	−	±	−	−	−	−

−, no agglutination. (±), ±, +, +±, ++, ++±, +++, increasing degrees of agglutination.

In September, 1943, in the course of a survey for carriers, her serum gave the following agglutinations (North-western Group Laboratory, L.C.C.): *Bact. typhosum* H 1/320; *Bact. typhosum* O 1/160; and *Bact. typhosum* Vi 1/40.

Typhoid bacilli were isolated from the fæces on four occasions in September and October. Agglutination tests, repeated in August, 1944, gave the following results: *Bact. typhosum* H 1/125; *Bact. typhosum* O 1/125; *Bact. typhosum* Vi 1/2; and against her own organism 1/250. *Bact. typhosum*, phage type D_1, was isolated frequently in February, March, April, and May, 1945.

Cholecystectomy was performed in June, 1945, the patient making a good recovery. Typhoid bacilli were grown from the gall-bladder removed at operation, and after operation the organism was again isolated from the fæces on six occasions in June and July, with one negative result intervening.

During the month's observation before treatment with penicillin and sulphathiazole the patient ran an irregular temperature ranging between 100° and 97° F. This subsided on the third day of treatment, since when the temperature has remained normal. Typhoid bacilli were isolated from the stools passed on thirteen occasions (March 18, 19, 20, April 1, 2, 3, 4, 5, 8, 9, 11, 12, and 15), but not from the five stools passed on March 21, 22, 25 (2 stools), and April 10. Stools were not passed on the days not mentioned.

Treatment was started at 6 P.M. on April 15 and continued for eight complete days, a total of 24,800,000 units of penicillin and 49 g. of sulphathiazole being given. No local or constitutional ill effects attended the treatment. After the second day of treatment typhoid bacilli ceased to be isolated from the stools, and for over 130 days bacteriological examinations of both stools and urine for this organism have been consistently negative.

CASE 2.—A woman, aged 69, admitted to Bexley Hospital on transfer from Canterbury Mental Hospital in April, 1941, had no history of typhoid infection or T.A.B. inoculation, but in April and May, 1945, she had a mild pyrexia for twenty-eight days, which began seven days after being in contact with case 1. In retrospect it now appears that this may have been a mild attack of typhoid fever. On March 26, 1946, on bacteriological examination of the fæces following a serological survey, *Bact. typhosum*, phage type D_1, was isolated.

During the month's observation before treatment Bact. typhosum was isolated from the fæces passed on twenty occasions (March 31, April 1, 3, 4, 5, 9, 11, 12, 15, 16, 17, 18, 20, 23, 24, 25, 26, 27, 28, and 29). Stools were not passed on the intervening days. Thus, every stool passed gave a growth of *Bact. typhosum*. *Bact. typhosum* was not isolated on any occasion from the urine.

Treatment with penicillin and sulphathiazole was started on April 29 and continued until the morning of the fifth day, when sulphathiazole by mouth was stopped owing to persistent vomiting and 1 g. of sulphapyridine was given intramuscularly for six successive doses. As the vomiting then ceased, sulphathiazole was resumed orally without further ill effect. A total of 21,420,000 units of penicillin, 36 g. of sulphathiazole, and 6 g. of sulphapyridine were given.

Apart from the bout of vomiting, presumably due to the sulphathiazole, the treatment had no constitutional ill effect, nor was there any local irritation at the site of the injections. *Bact. typhosum* was isolated from the fæces on the second day of treatment, since when for over 116 days intensive bacteriological examination of the morning urine and of every stool passed has failed to isolate organism.

Agglutination Reactions.—Neither patient showed a fall in the agglutination titres for typhoid H and O, but 8–10 weeks after treatment both showed a definite reduction in typhoid-Vi agglutination titres and a further reduction after another four weeks (see table I).

DISCUSSION

It is noteworthy that, in both cases reported, *Bact. typhosum* was not isolated from the fæces after the second day of treatment, with the same intensive bacteriological methods as gave positive results on almost every stool before treatment. It seems reasonable to infer that the synergic action of penicillin and sulphathiazole has at least inhibited the growth of *Bact. typhosum* in the alimentary tracts of both these patients, though a much more extended period of observation is necessary before a safe conclusion can be reached that the carrier state has been cured. Case 1 continued to excrete typhoid organisms after cholecystectomy, a not unusual occurrence.

The typhoid H and O agglutination titres after treatment showed no reduction. A much longer interval, however, is required before they can reasonably be expected to show a diminution associated with the disappearance of the typhoid organism from the body of the patient. Nevertheless the reduction of the Vi titre two months after treatment may be interpreted as indicating that the activity of the organism has ceased in these two patients.

In both cases the organism belonged to phage type D_1, a type not included in those investigated by Big

TABLE II—APPEARANCE OF BROTH CULTURES OF *Bact. typhosum* PHAGE TYPE D_1, AFTER 48 HOURS' INCUBATION (STANDARD INOCULUM)

Tube no.	Penicillin (units per ml.)	Sulphathiazole (mg. per 100 ml.)	Case 1	Cas
1	8	0	(±)	(±
2	4	0	±	±
3	2	0	+	±
4	1	0	+±	+±
5	0	0	++	++
6	8	10	−	−
7	4	10	(±)	±
8	2	10	±	±
9	1	10	±	±
10	0	10	±	±
11	0	5	±	±
12	0	2·5	+	+
13	0	1·25	+±	+±

−, broth clear. (±), ±, +, +±, ++, increasing degrees of turbidity. Both tubes 6 remained clear after 96 hours' incubation.

e laboratory the organisms were tested for peni- and sulphathiazole sensitivity by the methods bed in Bigger's paper, and the results are given ole II.

is evident, then, that our organisms of phage type xhibit in-vitro sensitivity to sulphathiazole and illin mixtures similar to those of Bigger's series, t seems reasonable to infer that this sensitivity so found in the living patient in the two cases tigated.

e bacteriological results obtained in these cases the question of treating other bacillary infestations ie alimentary tract by this method. Should the rgic action of penicillin and sulphathiazole, or other ionamide, be as effective in treating dysentery ers as it appears to be in typhoid carriers, the lem of dysentery, in mental hospitals in particular, ld be brought much nearer to an adequate ion.

ur experience with these patients shows that the tment can be carried out in relatively non-coöperative tal patients, even in those showing, as one of ours much wasting besides profound mental deterioration.

SUMMARY

wo typhoid carriers, one of whom continued to ete *Bact. typhosum* after cholecystectomy, have treated with penicillin and sulphathiazole on the s suggested by Bigger[1] for typhoid fever.

ntensive bacteriological examination of every stool r treatment failed to reveal the presence of *Bact. iosum* in them for periods of over 130 days in the case, and over 116 in the other.

wo months after treatment both patients showed uced agglutination titres to typhoid-Vi antigen.

hese results encourage the application of this method treatment in a larger number of typhoid carriers to its effectiveness.

Ve wish to thank Dr. R. Cruickshank for the early work ried out at the North-western Group Laboratory; Dr. A. ix for the phage typing; Prof. J. W. Bigger for much pful information; Surgeon Captain R. G. Henderson, dical superintendent of the Southern Hospital, Dartford, supplying the penicillin; Dr. L. C. Cook, medical super- endent of Bexley Hospital, for his interest; and our hnical staffs, in particular Mr. C. R. Wright and Miss S. ll, for much painstaking coöperation.

YRIDOXINE (VITAMIN B_6) IN EPILEPSY

A CLINICAL TRIAL

J. TYLOR FOX
A., M.D. Camb., D.P.M.
DICAL SUPERINTENDENT

GLADYS M. TULLIDGE
M.D. Lond., D.T.M. & H.
ASSISTANT MEDICAL OFFICER

LINGFIELD EPILEPTIC COLONY, SURREY

Harriette Chick and her colleagues (1938) observed at pigs deprived of pyridoxine (vitamin B_6) developed pical epileptic fits, and further (1940) that similar s occurred in rats which had been maintained for long riods on a purified synthetic diet supplemented with d-liver oil, pure vitamin B_1, riboflavine, and purified ast-filtrate factor. In either case the fits could be evented or stopped by the addition of pure pyridoxine the diet, and the authors concluded that they were e to deprivation of this vitamin.

There seemed, therefore, to be some justification r a clinical trial of pyridoxine in epilepsy. Eight hoolboys, aged 14–15 years and living in the same home, ere selected: 2 of them had petit mal only; 2 had tit mal with occasional grand mal; 2 petit mal with ore frequent grand mal; and 2 more numerous fits varying type. The cases were selected because of the gularity of the fits, and previous anticonvulsant medication, whether bromide, phenobarbitone, or phenytoin, was continued throughout the experiment.

Our intention was to give one member of each pair 20 mg. of pyridoxine daily for eight weeks, and then the second member of each pair a similar dose in the following eight weeks. When, however, it became apparent that there was no change in incidence of the fits, the daily dose was increased to 100 mg. and the experiment shortened. In the end, 4 boys had received 100 mg. a day for three weeks, 2 had received 20 mg. a day for four weeks and then 100 mg. a day for four weeks, and 2 only 20 mg. a day for eight weeks. There was no evidence of increase or decrease of fits in any case, nor was any other change, mental or physical, noted in any of the boys. So far as this short series of cases is a guide, it seems unlikely that pyridoxine, even in large doses, would be of value in epilepsy.

We are grateful to Messrs. Vitamins Ltd. for supplying us with large quantities of the vitamin, and to Dr. Audrey Baker, of their research laboratory, for her coöperation and suggestions.

REFERENCES

Chick, H., Macrae, T. F., Martin, A. J. P., Martin, C. J. (1938) *Biochem. J.* 32, 2207.
— El Sadr, M. M., Worden, A. N. (1940), *Ibid*, 34, 595.

PRIMARY DIPHTHERIA OF THE CONJUNCTIVA

REPORT OF TWO CASES

ARCHIBALD R. MILLER
M.D. Glasg., D.P.H.
DIVISIONAL MEDICAL OFFICER,
GLASGOW CORPORATION

DOROTHY E. BLOWER
M.B. Lond.
GENERAL
PRACTITIONER

Two cases of diphtheria affecting the eye only are recorded here, not so much because of the rarity of the condition (Medical Research Council 1930) as because of the rarity of finding the disease being passed from one person to another and affecting the same unusual site in both.

CASE 1.—A girl, aged 3 years, sickened of what was at first thought to be a cold, characterised by nasal discharge and injection of the conjunctivæ. When she was seen by the family doctor four days later the nasal discharge still persisted, and one eye was much inflamed, with very congested conjunctiva, much swollen eyelids, especially the upper one, and a profuse purulent discharge. The child did not appear particularly ill apart from the local condition, and there was no obvious toxicity.

At this stage she was referred to the outpatient department of the Glasgow Eye Infirmary for advice, and there the tentative diagnosis of a diphtheritic infection was made, a swab being taken for bacteriological examination. This was subsequently found to contain corynebacteria, and the child was admitted to a fever hospital while further investigations of the organism were undertaken. These were eventually found to be *C. diphtheriæ* and to be virulent. Although a membrane was reported as being present on the inner aspect of the upper lid its presence was not demonstrated at the fever hospital.

The girl made an uneventful recovery, treatment consisting of antidiphtheritic serum 4000 units and local applications of 'Argyrol' and saline. Repeated cultures from the nasal discharge did not reveal any diphtheritic organisms.

CASE 2.—Four days after the admission of case 1 her brother, aged 5 years, developed a similar condition. The mother, profiting by her previous experience, took him to the doctor at once. The conjunctiva was congested, and the lids were swollen, especially the upper one, but the discharge, though copious, was watery and not purulent. There appeared to be little or no general upset. There was no sign of any discharge or infection elsewhere.

As a precaution, pending further investigation, 4000 units of antidiphtheritic serum was given intramuscularly, and a swab was taken from the eye. The boy was confined to bed. Cultures from the swab revealed the presence of corynebacteria. The patient's local condition appeared now to be improving and his general condition was good. As there were no other children in the house, it was decided to keep him at home. In due course the bacteriologist reported that these organisms too were *C. diphtheriæ* and were virulent on biological test. By this time the eye had returned to normal and the patient seemed well.

There seems to be little doubt that the second patient was infected from his sister. There were no other cases of diphtheria of any kind at that address, and the patients did not attend any school or day-nursery. There was remarkably little toxic absorption from the conjunctiva. Neither child had any complications, and there was only a moderate rise in temperature. In case 1 the temperature was 100·2° F on admission to hospital and normal by the next day, and in case 2 no rise of temperature was found.

Harries and Mitman (1940) point out that the toxicity of non-respiratory diphtheria, though variable, is usually slight, and that diphtheria of the conjunctiva may be followed by rapid destruction of the globe. No suggestion of this was seen in either of these cases, but both were relatively quickly brought under treatment. *We have not been able to find in the literature* any record of the disease spreading from one patient's eye to that of another. The Medical Research Council (1923) reported that, though diphtheritic conjunctivitis was formerly considered fairly common, most modern writers agreed that conjunctivitis caused by true virulent diphtheria bacilli was rare.

REFERENCES

Harries, E. H. R., Mitman, M. (1940) Clinical Practice in Infectious Diseases, Edinburgh, p. 157.

Medical Research Council (1923) Diphtheria, London, p. 229; (1930) A System of Bacteriology in Relation to Medicine, London, vol. v, p. 100.

PERITONEAL NODULES OF UNKNOWN ÆTIOLOGY

HASSAN IBRAHIM
M.B., M.Ch.
SURGICAL TUTOR, KASR EL AINI HOSPITAL, CAIRO

MILIARY nodules of the peritoneum are sufficiently rare to be worth recording.

A married woman, aged 29, with no children, had had frequent attacks of tonsillitis up to the age of 8 years, once complicated by quinsy. She had never had acute rheumatism, chorea, or any other rheumatic manifestation. She had had an attack of gastric pain accompanied by vomiting and hæmatemesis, lasting twenty-four hours, at the age of 8 years, and a similar but milder attack two years later. At the age of 19 she had sciatica.

Two years ago she began to have epigastric pain, occasional vomiting, constipation, and lassitude. She had periodic exacerbations of the pain lasting 2–4 days, alternating with periods of relative freedom. Continuous slight fever, ranging from 99° F to 102° F, persisted throughout. The symptoms were worse during the summer and tended to improve during the winter. She had always been thin, and lost 8 kg. during the illness.

Various conditions had been suspected and treated—e.g., gall-bladder disease, liver disease, renal colic, spastic colitis, and appendicitis—but none had been confirmed. In the spring of 1943 she had two severe attacks of generalised abdominal pain accompanied by high fever, up to 103° F, and aching in the limbs.

On examination, the heart and lungs were normal. A definite tenderness over McBurney's point and over the whole right iliac fossa led to a diagnosis of appendicitis and operation.

Operation.—The abdomen was opened through a low right paramedian incision. The terminal coils of the ileum, especially along its mesenteric attachment, were studded all over with hundreds of white nodules, about 2 mm. in diameter. There were also nodules on both aspects of the mesentery. The condition stopped just short of the cæcum, which was normal. The nodules were scattered singly and in bunches of 10 or more, resembling collections of small pearls. Though sessile, they were only slightly adherent to the intestine and could easily be picked off with forceps leaving no bleeding points behind. The parietal peritoneum appeared to be quite free from nodules, and neither fluid nor congestion was present. No other abnormality was found, and the stomach, duodenum, gall-bladder, bile-ducts, and liver appeared normal. The appendix was removed, and some of the nodules were taken for biopsy.

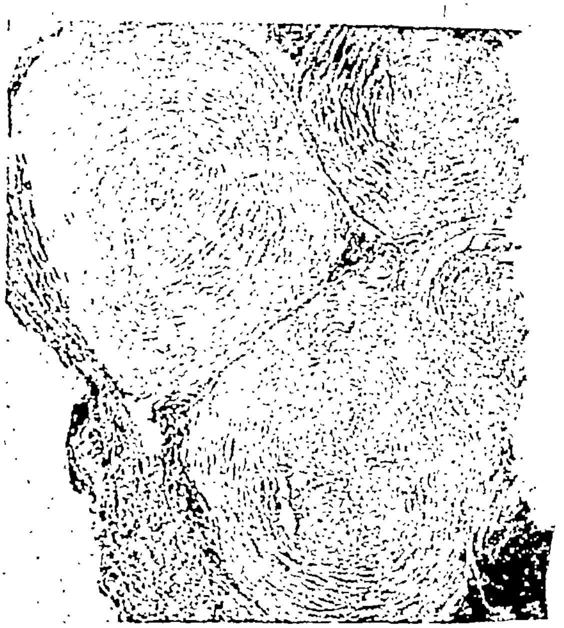


Fig. 1—Conglomerate mass of nodules with vascular fibrous tissue in between. (Low power.)

Histological Examination.—The first sections showed conglomerate nodules of whorled fibrous tissue (fig. 1). One of the larger nodules was fibrous, its centre consisting of hyaline fibroid tissue in concentric layers with empty fusiform spaces between the fasciculi (fig. 2). The periphery of the nodule consisted of fibrous tissue which was fairly vascular, sometimes hæmorrhagic, and moderately cellular. A peripheral round-cell infiltration of chronic inflammatory type was also seen (fig. 3). *A single group of endothelioid* cells, similar to an Aschoff body, was present in the outer cortex of the nodule, embedded in vascular fibrous tissue (fig. 4) and closely related to blood-vessels. Smaller fibrous nodules were lying close together, with delicate cellular fibrous tissue between

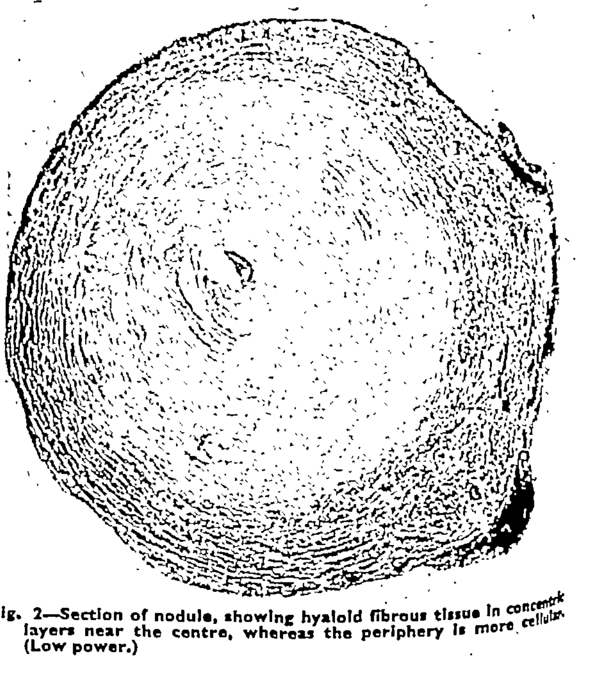
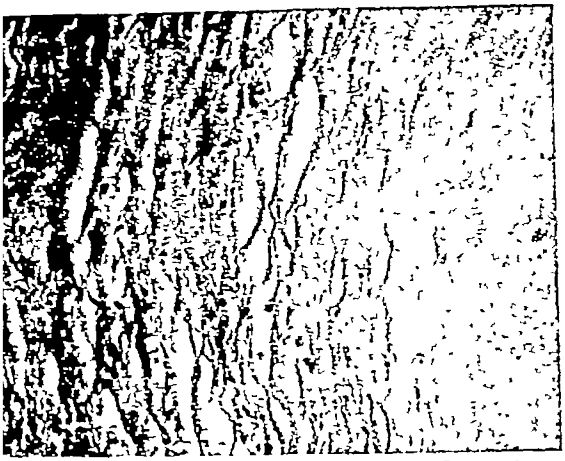


Fig. 2—Section of nodule, showing hyaloid fibrous tissue in concentric layers near the contre, whereas the periphery is more cellular. (Low power.)



3—Periphery of nodule, showing the more cellular fibrous tissue. (High power.)

n. The nodules were covered with a single layer of flat sa cells. Careful search failed to reveal any bilharzia ova emnants of ova in any of the many sections examined. a whole, the histological appearance suggested a chronic -pyogenic inflammatory condition.

DISCUSSION

)nly scanty references to nodular lesions of the itoneum have been published. Haythorn (1933) ssifies nodular lesions of the peritoneum as:

Tuberculous.

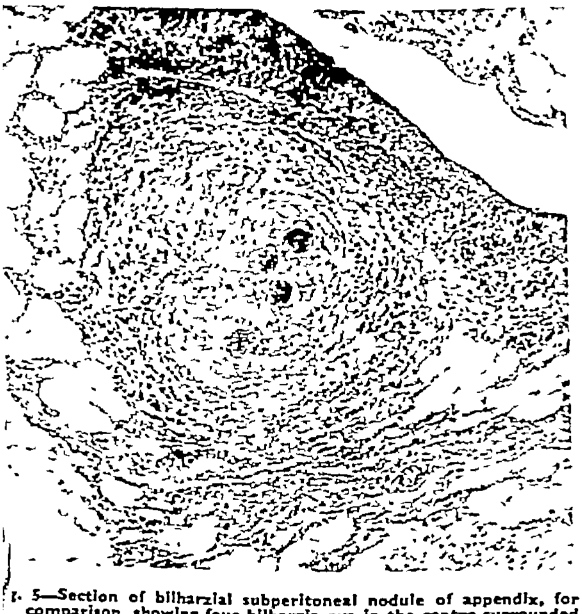
Pseudotuberculous (due to various bacilli).

Syphilitic.

Due to fungus infections.

Foreign-body granulomas due to (*a*) animal parasites, such as bilharzia, *Entamœba histolytica*, or *Oxyuris vermicularis*; (*b*) extravasated blood; (*c*) gelatinous substances, including ruptured pseudomucinous cysts and extraneous substances; (*d*) oils and free fats; (*e*) extruded gastric and intestinal contents; (*f*) extraneous foreign bodies, such as sutures, &c.

) Neoplasms, such as carcinoma, sarcoma, melanosarcoma, Hodgkin's disease, &c.



5—Section of bilharzial subperitoneal nodule of appendix, for comparison, showing four bilharzia ova in the centre surrounded by several layers of endothelioid cells and a peripheral lymphocyti and fibroblastic reaction.

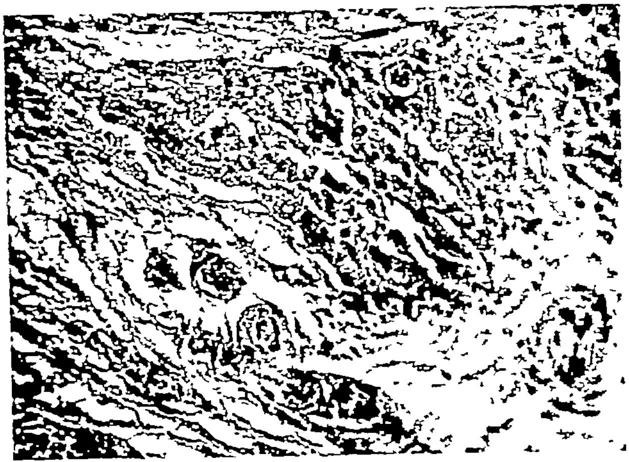


Fig. 4—Aschoff's nodule found in cellular periphery of a fibrous nodule. (High power.)

Except bilharziasis, none of these conditions resembles the present findings, either macroscopically or microscopically. Even bilharziasis can probably be excluded. Bilharzial nodules are usually firmly adherent and resist stripping when picked up with the forceps. They affect the large intestine rather than the small, and are accompanied by signs of bilharzial infection of the mucosa. Bilharzial dysentery, with diarrhœa, tenesmus, the passage of blood and mucus, and with ova in the stools, is usual in such cases. All these features were absent in the present case.

The strongest evidence against bilharziasis is the fact that no trace of ova or remnants of ova were found in any of the serial sections examined. Remnants of ova —i.e., the chitinous capsule and spine—are very persistent and are always found in bilharzial lesions, however old they may be (fig. 5). The Aschoff bodies found in this case have never been seen in bilharzial conditions.

Bilharziasis is only accompanied by fever for a short time after the initial stage of infection and never causes continuous fever lasting for years. Careful inquiry failed to reveal any exposure to bilharzial infection in this case.

The similarity of the lesions to Aschoff's nodules suggested the possibility of a rheumatic ætiology. Rheumatic peritonitis has often been described, usually in association with arthritis and carditis, and the subject has recently been discussed by Berger (1945). In the present case the absence of all other rheumatic manifestations, the fact that the lesions were limited to the peritoneum, and the doubtful interpretation of the histological findings, do not justify the condition being definitely designated as rheumatic.

SUMMARY

In a woman of 29 years with recurrent abdominal pain and fever for two years operation revealed an unusual miliary nodular condition of the peritoneum especially over the terminal ileum.

The nodules consisted of whorls of fibrous tissue, and some contained collections of endothelioid cells resembling Aschoff bodies. No bilharzia ova were found.

The findings pointed to a chronic non-pyogenic inflammatory condition, but no cause could be determined.

I am indebted to Dr. M. Sorour, professor of pathology in the Fouad 1st University of Cairo, for his full report on the histological sections; Major G. D. Morgan, R.A.M.C., for similar assistance; and Brigadier Evan Bedford for his guidance in reporting the case.

REFERENCES

Berger, H. (1945) *Ann. intern. Med.* **22**, 97.
Haythorn, S. R. (1933) *Amer. J. Path.* **9**, 725.

were no other children in the house, it was decided to keep him at home. In due course the bacteriologist reported that these organisms too were *C. diphtheriæ* and were virulent on biological test. By this time the eye had returned to normal and the patient seemed well.

There seems to be little doubt that the second patient was infected from his sister. There were no other cases of diphtheria of any kind at that address, and the patients did not attend any school or day-nursery. There was remarkably little toxic absorption from the conjunctiva. Neither child had any complications, and there was only a moderate rise in temperature. In case 1 the temperature was 100·2° F on admission to hospital and normal by the next day, and in case 2 no rise of temperature was found.

Harries and Mitman (1940) point out that the toxicity of non-respiratory diphtheria, though variable, is usually slight, and that diphtheria of the conjunctiva may be followed by rapid destruction of the globe. No suggestion of this was seen in either of these cases, but both were relatively quickly brought under treatment. We have not been able to find in the literature any record of the disease spreading from one patient's eye to that of another. The Medical Research Council (1923) reported that, though diphtheritic conjunctivitis was formerly considered fairly common, most modern writers agreed that conjunctivitis caused by true virulent diphtheria bacilli was rare.

REFERENCES

Harries, E. H. R., Mitman, M. (1940) Clinical Practice in Infectious Diseases, Edinburgh, p. 157.

Medical Research Council (1923) Diphtheria, London, p. 229; (1930) A System of Bacteriology in Relation to Medicine, London, vol. v, p. 100.

PERITONEAL NODULES OF UNKNOWN ÆTIOLOGY

HASSAN IBRAHIM
M.B., M.Ch.
SURGICAL TUTOR, KASR EL AINI HOSPITAL, CAIRO

MILIARY nodules of the peritoneum are sufficiently rare to be worth recording.

A married woman, aged 29, with no children, had had frequent attacks of tonsillitis up to the age of 8 years, once complicated by quinsy. She had never had acute rheumatism, chorea, or any other rheumatic manifestation. She had had an attack of gastric pain accompanied by vomiting and hæmatemesis, lasting twenty-four hours, at the age of 8 years, and a similar but milder attack two years later. At the age of 19 she had sciatica.

Two years ago she began to have epigastric pain, occasional vomiting, constipation, and lassitude. She had periodic exacerbations of the pain lasting 2–4 days, alternating with periods of relative freedom. Continuous slight fever, ranging from 99° F to 102° F, persisted throughout. The symptoms were worse during the summer and tended to improve during the winter. She had always been thin, and lost 8 kg. during the illness.

Various conditions had been suspected and treated—e.g., gall-bladder disease, liver disease, renal colic, spastic colitis, and appendicitis—but none had been confirmed. In the spring of 1943 she had two severe attacks of generalised abdominal pain accompanied by high fever, up to 103° F, and aching in the limbs.

On examination, the heart and lungs were normal. A definite tenderness over McBurney's point and over the whole right iliac fossa led to a diagnosis of appendicitis and operation.

Operation.—The abdomen was opened through a low right paramedian incision. The terminal coils of the ileum, especially *along its mesenteric attachment*, were studded all over with hundreds of white nodules, about 2 mm. in diameter. There were also nodules on both aspects of the mesentery. The condition stopped just short of the cæcum, which was normal. The nodules were scattered singly and in bunches of 10 or more, resembling collections of small pearls. Though sessile, they were only slightly adherent to the intestine and could easily be picked off with forceps leaving no bleeding points behind. The parietal peritoneum appeared to be quite free from nodules, and neither fluid nor congestion was present. No other abnormality was found, and the stomach, duodenum, gall-bladder, bile-ducts, and liver appeared normal. The appendix was removed, and some of the nodules were taken for biopsy.

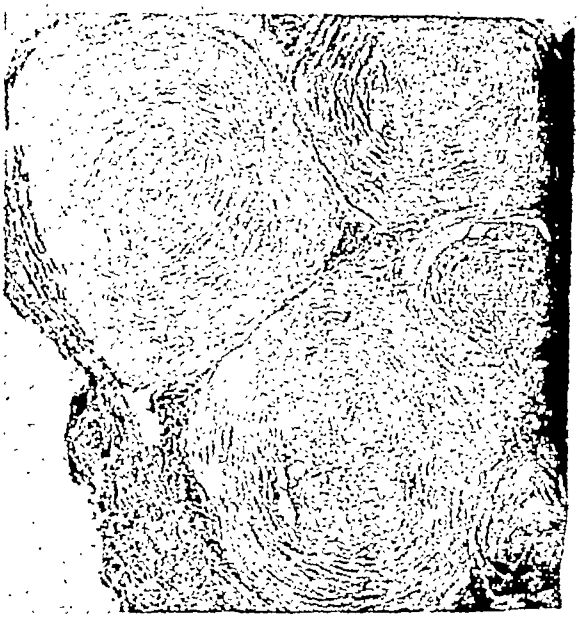


Fig. 1—Conglomerate mass of nodules with vascular fibrous tissue in between. (Low power.)

Histological Examination.—The first sections showed conglomerate nodules of whorled fibrous tissue (fig. 1). One of the larger nodules was fibrous, its centre consisting of hyaloid fibroid tissue *in concentric layers with empty fusiform* spaces between the fasciculi (fig. 2). The periphery of the nodule consisted of fibrous tissue which was fairly vascular, sometimes hæmorrhagic, and moderately cellular. A peripheral round-cell infiltration of chronic inflammatory type was also seen (fig. 3). A *single group* of endothelioid cells, similar to an Aschoff body, was present in the outer cortex of one nodule, embedded in vascular fibrous tissue (fig. 4) and closely related to blood-vessels. Smaller fibrous nodules were lying close together, with delicate cellular fibrous tissue between

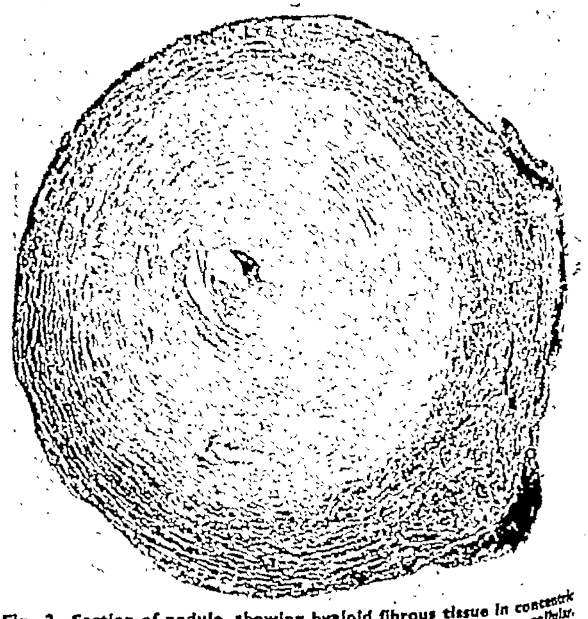


Fig. 2—Section of nodule, showing hyaloid fibrous tissue in concentric layers near the centre, whereas the periphery is more cellular. (Low power.)

THE LANCET

LONDON: SATURDAY, SEPT. 7, 1946

Medicine, Population, and Food

IN the past, populations have been held in check disease, famine, and war, and to a lesser extent contraception and infanticide. Of these factors sease has probably been the most important. estilences, such as the plague of Justinian (of which ROCOPIUS[1] has left so accurate a record), the Black eath, cholera, and influenza have slain their millions; nd of even greater importance have been the ever-resent diseases, such as pneumonia, gonorrhœa, and alaria. There is evidence that the decline and fall Greece and Rome were accelerated, even if they ere not initiated, by malaria: the sequence of events familiar to everyone who has lived in the tropics—eforestation by man and his goats, soil erosion, vampy valleys, and mosquito breeding. Today, in frica, India, and the Far East, malaria rivals and ossibly outstrips malnutrition as a cause of mortality mong young children, while in adults it lowers esistance to other infections: an estimate on the onservative side suggests that every year at least million persons are killed by the various species of lasmodium. Pneumonia, too, is an important cause f death among primitive peoples and especially mong negroes in Africa: it appears in epidemic almost every year, with the advent of the cooler eather. Gonorrhœa, by causing sterility in both exes, has been one of the primary causes of a low irth-rate. Even in war, despite the growing deadliess of offensive weapons and the increasing effectiveess of preventive measures, deaths from disease have lways exceeded those from enemy action, while the esults of disease far outlast those of bullet and bomb. ermany and the whole world are still suffering, s ALDOUS HUXLEY[2] has pointed out, from the isease and devastation wrought by the Thirty Years Var (1618–48). Only the atom bomb seems comarable in its lethal effects to that of pathogenic arasites.

If we wish, we can now do much to decrease the nfections which have hindered increase of population. or the first time in the world's history we possess emedies capable of reducing malaria, pneumonia, nd gonorrhœa. In 'Paludrine,' it is said, we have at ast a true causal prophylactic for both malignant nd benign tertian malaria, as well as a curative gent in advance of any previously known: it s cheap, easy to make in large quantities, and of ery low toxicity, and to the feminine half of the orld it offers the huge advantage of leaving the omplexion unaffected. By means of penicillin and he sulphonamides we can now reduce the death-rate rom pneumonia and can go far to prevent sterility rom gonorrhœa. Even some of the most primitive aces are already asking for large supplies of hese remedies as a panacea, while the sulphonmides have become so popular in West Africa that a profitable trade has developed in substitute tablets made from such unpromising materials as chalk, clay, or plaster-of-paris. Penicillin has the additional advantage that it is (in proper dosage) effective against syphilis, yaws, and tropical ulcer; and even localised causes of mortality, like typhus and trypanosomiasis, can now be controlled, either by chemotherapy or by using the newer insecticides. We still lack effective remedies against virus diseases and tuberculosis, but the progress of the last ten years encourages hope for the next ten.

There remains, in the form of malnutrition, one check to human life which could be even more deadly in the future than it has been in the past. Before the war we were already all too familiar in western civilisation with the huge sprawling city which, in the words of LEWIS MUMFORD,[3] had ceased to be a metropolis and had become a megalopolis and a parasitopolis: but most of us were less well aware that in parts of China, India, and Africa population was also, as in Europe, far in excess of indigenous food. Though local famines were sometimes reported, less was heard about the fact that even before the war 90% of people in the tropics were living on a diet which, though it might be adequate in calories for most of the year, was almost always deficient in proteins and vitamins of the B complex, while for some months, during what was euphemistically called "the hungry season," it was deficient in everything. Over 1000 million people were getting, on the average, less than 2250 calories daily.[4] Today, nobody in these islands is likely to forget that the shadow of a hungry season has spread from the tropics to the whole of the old world. If all the peoples of the world are to be properly fed, and if we add annually to their number all those who would previously have died from malaria, pneumonia, typhus, or trypanosomiasis, and all those who would never have been born if their parents had still been suffering from gonorrhœa or malnutrition, we shall need tremendous increases in the production and transport of essential foodstuffs. Such changes can be ensured only by a world authority empowered, if need be, to adjust national interests to international needs. Meanwhile, would it not be well for working parties, each consisting of a doctor, an agriculturist, a food technologist, a nutritionist, and a welfare worker, to visit not only the West Indies (as proposed by PLATT[5]) but every region in the world to report precisely on the prevailing conditions? Even on the most casual survey it is obvious that there are many areas where new and useful crops might be cultivated if only local governments and their agricultural departments could be stimulated to turn official memoranda into positive action. Similarly the example of the "food-yeast" factory, established for the benefit of the Caribbean zone, might be copied elsewhere. The whole question, in fact, of the synthesis of vitamins and essential amino-acids by laboratory methods on a manufacturing scale demands immediate attention.

Sir JOHN ORR's report to the conference which opened at Copenhagen on Sept. 2 proposes the establishment of a World Food Board. In the task

---

[1] Procopius (A.D. 449–565). Historiae (ed. Dindorf 1833–38).
[2] Huxley, A. *Grey Eminence*, London, 1941.
[3] Mumford, L. City Development, London, 1946.
[4] See *Times*, August 21, p. 2.
[5] Platt, B. S. Report on Nutrition in the British West Indies. Colonial no. 195. H.M. Stationery Office. 1946.

Reviews of Books

A Textbook of Forensic Pharmacy

THOMAS DEWAR, PH.D., B.PHARM. Lond., PH.C., barrister-at-law, examiner to the Pharmaceutical Society of Great Britain. London: Edward Arnold. Pp. 253. 10*s.* 6*d.*

SUCH a book as this has for long been urgently needed, for no-one could pretend that the laws controlling the preparation, sale, and use of poisons are concise or readily accessible. Yet the pharmaceutical chemist, the toxicologist, and the barrister all need more detail than can be obtained from the textbooks of forensic medicine or pharmacy. In this book every conceivable detail has been handled by an expert who knows its significance in practice, and the text defies criticism in this respect. The dullness which is inevitable in any long statement of the law is leavened by such charming quotations as these:

> Here phials in nice discipline are set,
>   There gallypots are rang'd in alphabet,
> In this place, magazines of pills you spy;
>   In that, like forage, herbs in bundles lie.
>
> GARTH, *The Dispensary*, Canto 1.
>
> Don't rely too much on labels,
>   For too often they are fables.
>
> SPURGEON, *Salt Cellars.*

Extensive footnote references to law and free use of practical examples make this a real yet easily handled compendium of reference. Its field embraces the forensic aspects of such widely diverse subjects as pure pharmacy, institutional dispensing, the Shop Acts, the Food and Drugs Act, and the Venereal Disease Act. Though intended primarily for the pharmaceutical student, the book is certain to have a wide circulation in both medical and legal circles.

The Physiological Basis of Medical Practice

(4th ed.) C. H. BEST, C.B.E., M.D., D.SC., F.R.S.; N. B. TAYLOR, M.D., University of Toronto. London: Baillière. Pp. 1169. 55*s.*

THE doctor—whether houseman, practitioner, consultant. or teacher—as well as the student, will continue to be attracted by this magnificent work. Best and Taylor has become a classic, providing a link between the laboratory and the wards. The authors animate the relatively dry bones of preclinical studies by emphasising their practical application to future clinical work; they bridge the gap when the student enters the wards; and for the houseman too, acutely aware of his lack of understanding, they explain the disorders of function which are perplexing him. Even the teacher at the bedside will find here a better way of giving the answer to many an anticipated question, and the sections on morbid physiology offer the basis for much intelligent research. Clinically the book is accurate and up to date and conforms to modern teaching. The extensive bibliography and the references are conveniently grouped under chapter headings at the end of the book. This edition appears in new form: double columns are said not only to save space but to make easier reading; but this seems doubtful.

A Complete Outline of Fractures, including Fractures of the Skull

(2nd ed.) J. GRANT BONNIN, M.B. Melb., F.R.C.S., late first assistant to the Injury Clinic, West London Hospital; recently surgeon in charge, fracture "A" centre, E.M.S.; major R.A.M.C. London: W. Heinemann. Pp. 658. 30*s.*

UNDER this promising title, Mr. Bonnin has really written a comprehensive textbook of fracture surgery. Almost 200 pages are given to general considerations, and the remainder to descriptions of the fractures of the various bones, including a brief but satisfactory chapter on those of the face and jaw by Mr. J. H. Barron. Writing primarily for students, Mr. Bonnin has selected carefully the material needing specially detailed description, and so has been able—in his chapters on ankle fractures, for instance—to expand and elaborate many of the principles applicable to fractures in general. Simple and complex methods of treatment are detailed and no examiner could cavil at the methods recommended. Moreover, by indicating and giving the reasons for his preferred methods, the author sets a personal stamp on his work: the book is no "rehash" of more extensive works on the subject. He says in his introduction that he writes with memories of the inadequacy of his student textbooks. This book is certainly not inadequate: in an age of dehydrated textbooks his full description is refreshing, and the reasonable student will not grudge the few extra hours its reading entails.

Dr. J. Ross Mackenzie's little handbook, *Practical Anæsthetics* (2nd ed., Baillière, Pp. 172, 10*s.* 0*d.*), for students and hospital residents, has been revised throughout. As in the first edition, teaching is primarily given to the fundamentals of practical anæsthesia. Many matters of no direct practical interest to the beginner are reviewed, but junior anæsthetists will find the book useful.

New Inventions

SIMPLE APPARATUS FOR MICRO-SUBLIMATION

THE apparatus here described was introduced by us in the chemical investigation of cases of *toxæmia.* Developments of micro-chemistry, in which the unit is a millionth of a gramme, suggested that it might be possible to identify some of the toxins which are present in such minute quantities that they have defied analysis. Many such substances are adsorbed by fine activated charcoal, and if this is given by the mouth and subsequently recovered the substances can be extracted from the charcoal. But included with the toxins are various alkaloidal and resinous substances, which the patient may have taken medicinally. It is in the separation of these fractions that this apparatus is so useful.

In general the micro-oven follows the form of the apparatus of Kempf. It consists of a brass block (see figure), which was a model engine casting. Two tubes of copper were turned to a driving fit, and driven into the cylinder cavities. At the suggestion of my assistant, Mr. W. G. King, one tube was made to project three inches and was tapered in the part outside the brass block. This part of the tube was marked off at half-inch intervals. A thermometer is fitted in the second bore-hole. The block was heated on an asbestos mat over a gas flame. A graph was made showing the temperature at each mark corresponding to standard temperatures of the block—say 200°, 250°, and 300° C. The temperature will decline from the block to the end of the long tube, so that different parts of the tube will be at different temperatures. The graph was made on half-inch paper, and thus the graph corresponded to the three inches of the tube.

A mixture to be separated is placed in a glass tube, closed at one end, and this is inserted into the graduated copper tube, so that the closed end of the glass tube is at the middle of the block, and it is marked at the end. On heating, sublimation will occur at intervals along the glass tube; and by laying the tube on the graph the approximate sublimation temperature can be found. The fractions can then be separated by the scratch and hot wire method. A scratch is made on the glass tube and the fracture is led round the tube by applying a hot bent-iron wire. Each fraction, so cut off, is then examined separately.

C. LOVELL, M.C., M.D. Lond.

Bethlem Royal Hospital.

bcutaneously and intradermally, using hollow edles, they reached the interesting conclusion that munity to vaccinia resulted only when there was local reaction which included the formation of a sicle, the latter being due presumably to back akage of the inoculum along the needle track.

Very little has been recorded in this country about accination by multiple pressure or intracutaneous rick, although both these methods are older than the ratch technique, and one of them was probably sed by JENNER. Most of the published papers deal ith the vaccination or revaccination of adults, and s regards infant vaccination there is but little in rint about any of the techniques. DUDLEY[5] found hat substitution of multiple pressure for the scratch method reduced sickness and disability due to vaccination and revaccination among the adolescent entrants o a naval school. PARISH,[6] however, noted that when t was used for the primary vaccination of a group of dults nearly a quarter of them had severe local eactions. It has been stated[3] that the results of evaccination by intracutaneous prick are easier to ead because local reaction due to trauma does not bscure the so-called immune and vaccinoid types of response. Another advantage attributed to vaccination by prick or pressure instead of by scratch is that no dressing is required; but this has not been the experience of at least one observer.[6]

It is by no means certain that trauma of the skin during insertion is the only cause, or indeed the chief cause, of severe local reactions. Although the bacterial content of vaccine lymph can be reduced to a low level by proper methods of manufacture, it remains a more or less unknown factor in any given vaccination; moreover observations with purified preparations of vaccinia virus suggest that local reactions still occur when bacteria are absent. Other factors of undetermined importance in this respect are the concentration of virus in the lymph and the immunity response of the individual. Touching on this there are the remarks of CRAIGIE as quoted by TULLOCH[7] in 1934: "the magnitude and endurance of the immunity response is primarily a question of the individual and his capacity to respond—not of vaccination technique. The amount of seed and the area of skin involved would seem to be of minor importance as regards immunity, so that nothing is to be gained by making either too great. If they are reduced to a minimum the developing immunity will be better able to overtake the proliferating virus, thus minimising reaction and the risk of sequelæ." This implies that minimal trauma during insertion may shorten the duration of the reaction and thus lessen its severity.

It would be well worth making some practical comparative studies of the three main methods of vaccination—dermal scratch, multiple pressure, and intracutaneous prick—on a scale big enough to give the results statistical significance. Teachers of vaccination at the medical schools might be able to undertake such studies in connexion with the vaccination of infants. For an investigation of the vaccination and revaccination of adults Service medical departments would be better placed.

Standards and Stampedes

THE victims of the housing shortage have reached the stage of exasperation. Squatters are moving into military camps in many parts of the country and taking joyful possession. It will be hard for the authorities to sort out those deserving priority, but the movement as a whole must command sympathy and understanding, in spite of the obvious embarrassments it creates. There is one risk, however, which needs to be watched with great care: that the shortage will lead to a lowering of accepted standards in housing, especially standards of amenity and hygiene. To meet emergency conditions minimum sanitation may do well enough for a time, but it is fatally easy to slide downwards, by allowing the temporary to become permanent and even to be slipshod about permanent building. The London County Council have set themselves high standards of amenity in the homes they propose to build. They have determined to keep abreast with modern developments in construction and fittings. Other areas would do well to follow this lead.

The question of accommodation is more serious and difficult. Both the Dudley Report and the Housing Manual of the Ministry of Health, while urging local authorities to study the actual needs of families in their areas, recommend that, for the time being at least, they should continue to provide three-bedroom houses as their main programme. Some doubt has been cast on the wisdom of this policy. Thus in the *Times* a correspondent asks, "Do we want tens of thousands of three-bedroomed houses? A three-bedroomed house is too big for a newly married couple:" and he goes on to speak of the "amount of waste space that is being built with our hard-pressed building resources." If we leave aside the special requirements of single persons and the aged, we can concentrate attention on the family. It is estimated that about 80% of families have no more than two children, and the "average" three-child family is represented by about 10%. On the face of it the *Times* correspondent seems right in saying that "continued overproduction of standard-sized houses is wasteful of resources," but he is on less solid ground in adding that "this must seriously retard the economic possibilities of any increase in the child population." The suggestion that the child population might be increased by reducing the number of bedrooms in the family house might be true, if family limitation were merely a matter of economics, but it is possible that other factors, including lack of bedrooms, act as a more direct brake on size of family. At any rate houses with only one or two bedrooms offer no encouragement to young married couples to be fruitful and multiply.

The story is not so simple as this. Indeed, it is doubtful whether the talk about waste space is well founded. Between 1919 and 1934 some 42% of the houses built were within the range of workers' incomes: a further 40% might, at some sacrifice, have been bought by the better off artisans; and the remainder were beyond their reach. Between 1934 and 1939 only 41% of the houses built (apart from slum clearance) were genuine working-class houses. In other words, a great host of three-bedroomed houses built between the wars were not for

---

5. Dudley, S. F., May, P. M. *J. Hyg., Camb.* 1932, 32, 25.
6. Parish, H. J. *Brit. med. J.* 1944, ii, 781.
7. Tulloch, W. J. *J. State Med.* 1934, 42, 633.

of feeding people better, the limiting factor at present is, he believes, not the physical capacity to produce enough food but the ability of nations to bring about the complex economic adjustments necessary to make adequate production and distribution possible.[4] To this the board would devote its efforts; and, given enough good will, the results might prove astonishing within our lifetime.

Activation of Skin Grafts

MODERN plastic surgery has firmly upheld THIERSCH's dictum that a skin graft takes better on an active or "excited" raw area than on one freshly prepared from normal quiescent tissue. Freshly cut tissue normally has to pass through a latent period of several days before proliferation becomes really active, and this latent-period is eliminated when grafts are transplanted to (for example) healthy granulations. "When a surgeon takes up his knife to cut into normal tissues," says PEYTON ROUS,[1] "everything has been prepared for operation except the structures immediately concerned." If graft beds are the better for being in an active state, is it not likely that the grafts themselves would benefit by activation?

ROUS has investigated this problem. Clipped rabbits' skin was painted with a mixture of turpentine and acetone to induce epidermal proliferation; and after a few days the epidermis, normally one or two cell-layers deep, had thickened five- or six-fold and was vigorously dividing. Grafts so activated were compared with those cut from normal quiescent skin, by grafting both simultaneously in patchwork arrangement to rather poorly vascular beds freshly cut down to the deep corium of the skin in the lumbar region. Histological analysis revealed the following credit and debit accounts. Activated grafts are easier to cut and handle and are less inclined to fold and contract. When they heal, they do so more rapidly and securely than normal skin; the donor areas are more quickly resurfaced and, if need be, yield more promptly a second crop of grafts. But there are grave disadvantages. The demands of hyperplastic skin for nourishment are naturally greater than those of normal quiescent skin, and a number of hyperplastic grafts promptly die when transplanted to poorly vascular beds, while their normal neighbours quietly "sit out time." Sometimes the hyperplasia itself is troublesome, since the deep follicle epithelium of an activated graft sometimes creeps between graft and bed and begins to infiltrate the underlying tissue.

ROUS's observation of the necrosis of activated grafts on poorly vascular beds is interesting in the light of MEDAWAR's guess[2] that a really thick graft should be deliberately deactivated, in order to lower its metabolic demands during the critical stage of vascularisation. The deactivation is simply a matter of allowing the graft surface to remain at room temperature instead of at body temperature, as when thick gauze or cotton-wool pads are put over it to maintain pressure. In plastic surgery uses may be found for both activation and deactivation. The former might fill the bill for pinch grafts transplanted *to highly active granulations, for pinch grafts are* never used unless speedy epithelial spread is needed. Deactivation might be the rule when full thicknes grafts are to be transplanted to poorly vascular, freshly cut, beds—for example, on the back of the hand. But for the ordinary run of skin-graftin there can be no question of adopting either activation or deactivation as a routine.

---

1. Rous, P. *J. exp. Med.* 1946, 83, 383.
2. Medawar, P. B. *Brit. med. Bull.* 1945, 3, 79.

How to Vaccinate

INFANT vaccination against smallpox will soo become voluntary, and opinions are divided abou the probable result of this change. Some think that the vaccination of about a third of the popul tion during the first year of life, achieved under th existing laws, will be maintained or even increas when medical services are extended under the n Bill. Others hold that hardly any infants will vaccinated when compulsion is removed. Mu will depend on the approach to the parents. Official sponsored health education has already had conside able success with immunisation against diphtheria but the case for vaccinating infants against small pox, though a good one, will be harder to prese attractively through the poster, the press, and th cinema. Probably the family doctor will have to d most of the persuasion.

The chief bugbears of vaccination are the bad ar and postvaccinal encephalomyelitis. The latter, rare complication, seems very rare indeed whe primary vaccination is not performed at school ag or during adolescence—a fact which forms a su stantial though somewhat awkward argument i favour of vaccination during infancy. The bad ar is a different and in some ways more importa matter. A severe local reaction, with or without mild general reaction, is fairly common, especiall in adults, and though its consequences are rarel serious it can cause a good deal of pain and tem porary disability. Much parental opposition t infant vaccination probably comes from a perso experience of this sort, perhaps after joining th Forces.

There is some reason to believe that the techniqu of vaccination can influence the incidence and severit of local reactions. In this country a single insertio through a scratch not more than a quarter of an inc long, has been recommended[1] to public vaccinato since 1930 for ordinary civilian vaccination; and th Service departments have mostly followed su In the United States another method known "multiple pressure" has been officially recom mended[2] for over twenty years. In this method th skin over an area about an eighth of an inch in diamete is subjected merely to a number of "pressures" wi a horizontally held needle, and there is no scratc nor even pricking of the skin as in another metho described by PEIRCE[3] in 1937. Intracutaneous o subcutaneous injection of ordinary vaccine lymp has never been advocated, but these methods o insertion have been tried with bacteria-free suspension of vaccinia virus obtained by egg culture and othe means. When HENDERSON and MCCLEAN[4] inoculate a suspension of the elementary bodies of vaccini

---

1. *Statutory Rules and Orders 1930, no. 2, p. 16.*
2. Leake, J. P. *Publ. Hlth Rep., Wash.* 1927, 42, 221.
3. Peirce, E. R. *Brit. med. J.* 1937, 1, 1066.
4. Henderson, R. G., McClean, D. *J. Hyg., Camb.* 1939, 39, 659

37 80% of the sweet corn for canning was grown hybrid seed.

Maize is a diœcious plant—that is, it produces male and nale flowers on the same plant. The male flowers, "tassels," at the top of the plant shed their pollen the slightest wind on to the stigmas or "silks" of e female flowers lower down. By growing two inbred re lines side by side and removing the "tassels" m one variety as soon as they appear, the fertilisation the cobs with pollen from the other variety is assured, d a "single-cross" hybrid, with the characteristic brid vigour, is obtained. If seed from self-fertilisation such a hybrid is grown, the next generation shows gregation and loss of the hybrid vigour. To maintain e vigour and uniformity of the cross, new hybrid ed must be produced in the same way every year—costly process and one which can only be undertaken on large scale by commercial seed-growers. Nevertheless, pays the grower to purchase this seed rather than to ow the ordinary varieties. Other types of hybrid an the "single-cross" are now sometimes used, because ey can be produced more economically, without loss the hybrid vigour. Thus, "top-cross" hybrids rosses between an inbred line and an ordinary variety), double-crosses" (two different single-crosses hybridised), d "three-way crosses" (with the seed parent a single-oss and the pollen parent a third inbred line) are now regular production. If only more of our food plants ere diœcious, their cultivation might, with heterosis, e revolutionised in the same way as the American corn-owing industry.

ENICILLIN AND SULPHATHIAZOLE IN TYPHOID FEVER

SINCE Bigger's report[1] on the apparently synergic tion of penicillin and sulphathiazole on strains of *acterium typhosum* in the test-tube, clinicians have been terested in the possibility of using this combined emotherapy against an infection which regularly takes s toll of 10 to 20 patients in every 100 cases. As igger showed, penicillin in a concentration of 2 units r c.cm. in vitro has an inhibitory but not bactericidal tion on some strains of the typhoid bacillus, and when is level of penicillin is combined with 10 mg. of sulphahiazole per 100 c.cm., most strains of *Bact. typhosum* re killed or effectively inhibited. With the recomended dosage of 2 mega units a day for the treatment typhoid cases a level of 2 units per c.cm. of penicillin the blood can usually be surpassed although levels of mg. of sulphathiazole per c cm. are rarely obtained ith the usual dosage of 6–8 g. per day. However, *act. typhosum* in moderate numbers can be inhibited vitro by lower concentrations of sulphathiazole –5 mg. per 100 c.cm) so that the combined therapy ould theoretically be effective. As a rule the best results ith chemotherapy are obtained in the early stages of an fection, when the pathogen is actually multiplying in e tissues, and on this basis the penicillin-sulphathiazole eatment of typhoid should be most successful before e end of the first week when the organism is still resumably proliferating in such foci as lymphoid tissue, one-marrow, and the gall-bladder. Less striking sults would be expected with treatment begun after e end of the second week, when typhoid toxæmia and lceration of the bowel with its attendant risks f hæmorrhage and perforation are the main features of e disease. Unfortunately few cases of typhoid fever re diagnosed in the first week of infection but penicillinlphathiazole may be exhibited in the early stages f the not infrequent relapses, while McSweeney[2] has laimed good results in a few cases treated in the second nd third weeks.

When treatment is begun late useful objective criteria of the severity of the disease may be a positive blood-culture and low titre of O antibody. Blood should therefore be taken immediately before treatment is begun; the clot is cultured in bile or bile-broth and the serum examined for agglutinins. Besides its effect on the clinical infection careful observations should be made to find whether penicillin-sulphathiazole therapy will eliminate the infecting organism and thus secure early bacteriological cure. After an attack of typhoid fever, patients may continue to excrete the organism for many weeks in convalescence and it is estimated that some 2% of affected patients become chronic typhoid carriers. In the convalescent stage the organism persists mainly in the gall-bladder and bone-marrow; in the chronic carrier the usual focus is the gall-bladder, although, as the recent Aberystwyth outbreak exemplified, the possibility of urinary carriage must not be forgotten. Penicillin is concentrated in the bile as well as in urine and with massive doses effective levels may be obtained. McSweeney reported early negative fæcal cultures in 3 of his 5 treated cases (he does not say whether selective culture media were used) and in this issue (p. 343) Comerford, Richmond, and Kay record apparent success in the treatment of 2 typhoid carriers. In the past medical treatment of the chronic typhoid carrier has been uniformly disappointing, though cures have lately been claimed in individual cases with sulphaguanidine and succinyl sulphathiazole. In some of these cases chemotherapy has followed apparent failure of cholecystectomy —as happened with one of the 2 carriers now reported—and it is only fair to point out that cholecystectomy rarely leads to bacteriological cure before several weeks and occasionally months have elapsed after operation. Because of the possibility of intermittency of excretion it is wise also to continue laboratory examinations of fæces and blood (for Vi antibody) for at least a year after apparent cure. However, the results reported by Comerford and his colleagues will encourage others to try the effect of penicillin-sulphathiazole in chronic typhoid carriers, many of whom are known and kept under supervision.

A complicating factor that deserves attention when large doses of penicillin are being used for the elimination of relatively resistant organisms is that commercial preparations may contain 3 or 4 different penicillins[3] the activity of which vary in vitro and in vivo against different bacteria. Thus penicillin III (X) has been shown[4] to be more active than penicillin II (G) against pneumococci, hæmolytic streptococci, *Bact. coli*, and possibly gonococci, although in the usual standardisation tests the two penicillins are equally active against *Staph. aureus*. American workers[5] have also found that penicillin IV (K) although highly active in vitro against *Staph. aureus* and also against *Treponema pallidum* is relatively ineffective in the treatment of experimental rabbit syphilis, a phenomenon that has been correlated with its rapid disappearance from the blood. The poor results, compared with early successes, that have lately been reported[6] in the penicillin treatment of syphilis are also blamed on the high content of penicillin IV in commercial penicillin. Whether the increasing use of *Penicillium chrysogenum* and the deep tank aeration methods of production favour a greater yield of this biologically inert penicillin are matters for further investigation. Meanwhile these disturbing findings may largely invalidate the internationally accepted method of penicillin standardisation, the full report[7] on which was lately published as a special *Bulletin* of the Health Organisation. Obviously the manufacturer must take

---

1. Bigger, J. W. *Lancet*, 1946, i, 81.
2. McSweeney, C. J. *Ibid*, July 27, p. 114.
3. See Leading article, *Ibid*, 1946, i, 530.
4. Libby, R. L., Holmberg, N. L. *Science*, 1945, 102, 303.
5. Eagle, H., Musselman, A. *Ibid*, 1946, 103, 618.
6. *J. Amer. med. Ass.*, 1946, 131, 265, 271.
7. *Bull. Hlth Org. L. o. N.*, 1945–46, 12, no. 2.

the workers, but for comparatively well-to-do families. Further, just before the outbreak of the late war at least 225,000 houses were needed to complete outstanding slum-clearance schemes, quite apart from the vastly greater number of substandard houses which were sliding into slumhood in 1939. Nearly 300,000 houses were required to deal with overcrowding schemes at the exceedingly low standard set up for this purpose. About 150,000 houses were damaged beyond repair by enemy action. At least another 300,000 are needed to provide for the increase in the number of families since 1939. Miss MARIAN BOWLEY, PH.D.,[1] whose illuminating researches have produced a wealth of figures on the housing situation, estimates in addition that nearly four million workers' houses built before the 1914–18 war are so far below the lean standard of the three-bedroom, non-parlour house built by local authorities between the wars that they require replacement.

All the available evidence points to the conclusion that there is a great dearth of three-bedroom houses within the income range of working people, but this does not of itself prove that three-bedroom homes are desirable for the majority of families. We are confronted here with questions of opinion. In the Housing Manual of 1944 the Ministry of Health recommend the provision of three bedrooms of the following dimensions: first, 135–150 sq. ft.; second, 110–120; and third, 70–80. It is true that the young married couple do not require two and a half bedrooms until they have a child; but it is good for them to be able to contemplate the possibility of having a child without worrying about the accommodation, even for the confinement. People who are aghast at the thought of three bedrooms for working folk seem to have no idea how small the space really is, or what a blessing the little third room is for a variety of domestic purposes. They forget that such families may want visitors; that, like the rest of us, they often have to provide for aged relatives; and that there is sometimes sickness in the family. If we really mean to pursue a population policy, we ought to encourage families to have children. It is mere humbug to pretend that they will get larger houses when they have three children. In matters of this kind the stimulus should come before the event, and not as a lollipop promised for good conduct. In building houses to last sixty years we have no right to assume that the downward trend in family size will continue; even if it were to do so, the present area of a three-bedroomed house is nothing to be alarmed about—800–900 sq. ft.! As MUMFORD[2] says: "It is a false solution to build a dwelling so small that the psychological harmony of family life is sacrificed to economy of space."

---

1. Bowley, M. Housing and the State, London, 1945.
2. Mumford, L. The Culture of Cities, London, 1938.

THE INDEX and title-page to Vol. I, 1946, which was completed with THE LANCET of June 29, is published with our present issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

Annotations

AN INTERNATIONAL GATHERING

THIS year's conferences, after the lapse since 193[illegible] have all the savour of long-deferred family reunions. The international meeting under the chairmanship of Sir Hugh Lett, which, as announced in our news columns, is to be held towards the end of this month in London, will be attended with peculiar zest; for it is to be a world-wide gathering. Invitations have been sent to organisations in 42 nations, and the majority have already accepted. The principal business will be consideration of means to promote international liaison in medicine. This has hitherto been the aim of the Association Professionnelle Internationale des Médecins; but the A.P.I.M. has been concerned solely with professional and social medicine. The time has come for a wider range of international coöperation.

It is especially to be hoped that the new organisation foreshadowed in the agenda will sponsor an improved exchange of information, particularly on medical research. Rumour has it that several of the world's leading nuclear physicists are actively discouraging young men of promise from pursuing their specialty because they believe that the free exchange of information essential to progress in this field will never be resumed. No similar embargo threatens medicine; but some of its branches are rapidly becoming almost equally complex, demanding, no less than nuclear physics, the benefit of world-wide consultation. It is true that the main course of research in other countries is known to most in the top flight of their specialties; it is true also that the results of research are more or less easily available to all countries, through the medium of the *Quarterly Cumulative Index Medicus*, published in the United States. But to announce results is not enough: the time for the sharing of information is before research is initiated. Many forms of investigation must be planned and integrated globally if overlapping and needless reduplication are to be reduced and if each country's facilities and aptitudes are to be used to the best advantage.

HYBRID VIGOUR IN SWEET CORN

IN Britain the word "corn" denotes all kinds of cereal grains, whereas in America it refers exclusively to Indian corn or maize. This often caused confusion with our American friends during the war. Most people in this country understand, however, what is meant by the term "sweet corn"—the type of *Zea mays* characterised by a higher sugar content than the "field" corn used for animal feeding. Before 1939 sweet corn was not widely grown in this country, owing partly to unfamiliarity with methods of preparation and partly to the uncertainty of yield in our capricious climate; but interest was stimulated by the influx of American soldiers during the war and the call for vegetables to replace those normally imported. In the subsequent search for early varieties that might ripen successfully in this country, interest centred on the "hybrid" corns.

To most people a hybrid is a cross between two unlike parents, whether of different species or of different varieties; but with maize it has come to have the restricted connotation of a controlled cross between two or more inbred "pure lines," each with definite characteristics. Prof. George Shull, of Princeton University, was the first to show that by the crossing of two pure lines, each of which might be of very low yield, a hybrid of much greater vigour than either parent could be produced; he introduced the word "heterosis" to define this phenomenon of hybrid vigour. He began work as long ago as 1905, and by 1914 he had formulated all the principles for the commercial production of hybrid corns; it was not until 1924 that these valuable types began to be used in the United States, but by

This poses a triple problem: first, the relationship ween sterility and tuberculous endometritis; secondly, situation of the original tuberculous focus, which y, or may not, have been genital; and thirdly, the nificance and prognosis of the uterine disease. In a evious article[6] Halbrecht outlined the past history 18 cases of tuberculous endometritis; of these, 2 had d pleurisy in youth, 2 had had tuberculous peritonitis, d 3 others showed signs of other tuberculous affections persistent pararectal fistula, tuberculous adenitis, or p disease. It therefore appears that the endometrium ovides a long-term sanctuary for the tubercle bacillus. the same way that the gall-bladder harbours the phoid bacillus. The sequence is probably this: primary cus in lung or abdominal glands, systemic tuberculosis dissemination to the pelvic peritoneum, exosalpingitis endosalpingitis with tubal occlusion, and finally sidual tuberculous endometritis.

In a final word of reassurance, Halbrecht says that part from the endometritis his patients were all fit by ternal standards, and that, except for obliterating e tubes, the disease remained stationary and untrouble- me. For treatment he advises absolute conservatism ith complete abstention from surgical intervention. is conclusion that occult, subclinical tuberculous endo- etritis is one of the cardinal causes of sterility in general nd of tubal occlusion in particular may have come as omething of a shock to English workers; and it will e interesting to see whether, with further experience, milar reports appear in this country.

BOVINE PLASMA AGAIN

DURING the war there were several reports[7,8] on the se of bovine plasma or serum, and bovine albumin, blood-volume-restoring agents in man; but none of e authors felt justified in proposing their unrestricted se.

Any protein-containing substitute for human plasma ust obviously be non-antigenic, non-toxic, and free om agglutinins, and it should have at least the same motic pressure as human citrated plasma. None of the orkers who have reported so far have been willing to ate unequivocally that the first condition has been lfilled, while the solutions of highly purified ox-albumin epared in Cohn's laboratory at Harvard and used by eyl et al.[8] alone appear to fulfil the second. Of the vine material used, the ox-albumin seems least open criticism, and publication of the final conclusions awn from its trials—if in fact trials have been continued —will be very valuable. Meanwhile a report from arcelona on the preparation of bovine plasma and its se in man is published on another page of this issue. r. Massons has subjected his material to rigorous treat- ent to make it sterile and non-antigenic, but before e adoption of his bovine plasma can be recommended is claims must be substantiated by careful repetition his work, followed by controlled clinical trial. It is likely that the osmotic pressure of Massons' material equivalent to that of human plasma; indeed it is robably much less. His method of preparation is mple compared with Cohn's elaborate and expensive actionation, but its extreme simplicity will itself voke criticism.

The chief advantages of using a substitute for human lasma are that it will remove the danger of transmitting epatitis, and will lighten the burden of the many blood- onors who have given so faithfully. Unfortunately much ork still remains to be done before this can happen. o protein-containing substitute for human plasma n be employed until it has been clearly shown to be ot only harmless but also as effective as human plasma.

Lancet, 1946, i, 235.
Edwards, F. R. *Brit. med. J.* 1944, i, 73.
Heyl, J. T., Gibson, J. G., Janeway, C. A. *J. clin. Invest.* 1943, 22, 763.

CURARE IN NEUROLOGY

APART from anæsthesia, there are two outstanding uses for curare in medicine which may deserve more attention. There is mounting evidence that it can be used with reasonable safety by intravenous injection to minimise the chances of fracture in convulsion therapy, especially in the elderly. Palmer[1] has summarised the technique required. What may finally prove to be a much wider field is in spastic or dystonic neurological conditions, where no radical treatment is possible, and spasm limits the value of all forms of physiotherapy. Results have been published, for example, in tetanus, status epilepticus, infantile spastic paralysis of several kinds, parkinsonism, paralysis agitans, and Huntington's chorea. They have been dubious so far, for two reasons. There have invariably been troublesome side effects—blurred vision, diplopia, general weakness, and dizziness—and the effect has been transient, and not sufficiently definite in proportion to the severity of the symptoms to justify its routine use. Schlesinger[2] has now introduced a new factor by injecting the curare intramuscularly in a mixture of peanut oil and white wax, and so obtaining slow absorption. He finds that its action is thus prolonged up to three days, and that the unpleasant side effects do not develop. Confirmation is required, but it may be that this modification in technique will lead to welcome, although probably partial, relief for many patients who at present live many months functionally helpless. It should not be forgotten that a number of drugs, such as quinine methochloride, magnesium sulphate, and erythrine, are believed to have pharmacological effects similar to curare. There might be an advantage in achieving the same end with some such physiological analogue.

FOR AULD LANG SYNE

THERE can be few who served in the Forces during the war years who do not find some pleasure in the recollection. Perhaps memory is happily selective; perhaps, again, the rigours of present-day civilian life lend fictitious charm to any alternative. Whatever the reason, the tedium, the irritations, the occasional danger, and the frustration that largely compounded the life of the amateur soldier usually defer to happier memories. The life, though physically dangerous, was otherwise secure, with food and pay assured without special endeavour; many had the chance to see countries they would otherwise never have visited; and the return to the schoolboy community way of living fostered friendships which, but for the common share of discomfort and danger, would never have been sealed. The value attached to these ties has been shown by letters in our columns in the last few months: for the Army, a medical society has been proposed, and an airborne medical society is being formed. Mr. T. J. Daly, a former major and quartermaster, R.A.M.C., now writes to suggest an Army medical association to hold reunion dinners throughout the country; he offers fuller particulars of a tentative scheme to anyone writing to 1, Lancashire Road, Bishopston, Bristol. Ideas of this sort will be warmly supported by those who seek to preserve the little good that has emerged from the lost years.

---

1. Palmer, H. *J. ment. Sci.* 1946, 92, 411.
2. Schlesinger, E. B. *Arch. Neurol. Psychiat.* 1946, 55, 530.

SYSTEMATIC research into the common cold is to be undertaken in the United States, as well as in Great Britain (see *Lancet*, 1946, i, 822). In America, the investigation will be made by the National Institute of Health (the research division of the United States Public Health Service), directed by Dr. R. E. Dyer. Like the British workers, Dr. Dyer emphasises that it may be five or more years before substantial progress can be recorded, even allowing for the better understanding of viruses in the last decade.

steps to avoid producing penicillin with a high content of penicillin IV or alternatively must use methods for its elimination from the finished product. Failing the production of specific penicillins such as II or III, it would also seem desirable to supplement the in-vitro tests for penicillin standardisation by methods that have more direct relationship to therapeutic efficiency—e.g., the determination of residual penicillin levels in the blood of suitable animals.

DEATH AFTER SERUM

A DOMESTIC tragedy in Ireland, lately reported in the daily press, underlines the possible dangers of antitoxin, which were discussed in these columns a few months ago.[1] Having good reason to believe that one member of a household had contracted diphtheria, a doctor decided to protect the seven contacts by giving each a dose of antitoxin. The last to receive the injection, a girl of 14, complained a few minutes later that she had had an attack of asthma. Administration of a cardiac stimulant was of no avail, and the child died with acute heart-failure soon afterwards. The extreme rarity of such occurrences —perhaps 1 in 80,000 injections—is no reason for underrating their seriousness. Children are more liable than adults; crude serum is more likely than refined antitoxin to cause disaster; no intradermal or other test of sensitivity is entirely reliable; a history of asthma is a warning of the gravest significance; a bottle of adrenaline should be at hand, ready for immediate use, whenever an injection of serum is given. Such in brief is the extent of our knowledge. The induction of passive immunity, perhaps combined with active immunisation as suggested by Fulton and his colleagues,[2] is not only justifiable but also highly desirable on many occasions, but it must never be forgotten that it carries a small but definite risk.

A SCHOOL FOR DIPLEGICS

FEW conditions give such a false impression to the onlooker as cerebral palsy. A child moving with great difficulty, his knees rubbing together or crossing, his arms bent stiffly on his breast or sweeping about in athetosis, his lips dribbling, makes a picture which to the inexperienced means idiocy. Yet many such children are normal mentally, two-thirds of them are educable, and even those who reach colonies for mental defectives are usually among the higher grades. They may achieve much success in managing their disabilities, sometimes with little training or encouragement; it is remarkable to see how a boy learning weaving, for example, will wait for the exact moment when his athetosis will allow him to throw the shuttle. In the United States, where there are said to be some 200,000 cases, considerable advances have been made by Dr. Phelps, of Baltimore, among others, in the training and education of children with cerebral palsy. Now, thanks to the generosity and enthusiasm of Mr. Leslie Williams, who has subscribed a large sum of money and given much of his time to fostering the scheme, and of Colonel and Mrs. Garwood, who have lent their house at Croydon rent-free for seven years and contributed to the fund, a school for British children with this disability is to be founded.

At a luncheon to launch the scheme, held at the Trocadero Restaurant on August 26, Dr. Earl Carlson,[3] himself a diplegic, spoke of the school he has established in New York for 75 palsied children, aged from 2 years upwards. Of his staff of 30, 5 are trained teachers, and others are being trained for this work. Calling cerebral palsy the most neglected condition of childhood, he described the case of a young man who at 20 could not read and could scarcely talk; after 10 years of proper teaching he was admitted to a university and took a PH.D. He is now head of the high-school department Dr. Carlson's school. Children attending the scho for mental and physical training usually need stay o a few months. Dr. Carlson can estimate their intel gence; he finds, whatever their physical state, and c judge whether any child over the age of 3 years educable. Some return to the school for a few m at the age of 18 years before going on to a univers St. Margaret's, the new school at Croydon, will begin a small scale, but this short-stay plan will make it possi to deal with relatively large numbers of children. At f preference will be given to children who can feed the selves, are not incontinent or mentally defective, a who show a good promise of improvement.

The incidence of cerebral palsy is unknown—one es mate is 5–6 per 100,000 population. The cause is st doubtful, for though the theory of birth-injury long h the field (and the mothers often give a history of diffic labour), the pathological findings suggest rather a bl falling on the brain earlier in fœtal life, destroying s developing cells and allowing others, perhaps n mature, to escape; in the light of recent work infecti dietetic factors will no doubt be inquired into. Wheth the case is predominantly spastic, athetoid, or atax depends on the sites of the damage. The Rh fac probably has some part in the ætiology, for half Dr Carlson's patients give a history of jaundice in infancy

The house at Croydon is already being adapted to it new purpose. The board of management consists Mr. Williams, Prof. J. M. Mackintosh, Sir Ernest Cowell and Dr. William Moodie, and the medical advisers to th school will include a neurologist-pædiatrician, an orthopædic surgeon, and a specialist in physical medicine, al of whom will also be on the staff of Queen Mary's L.C.C Hospital for Children at Carshalton. The board a looking for a hostel where the parents of those enter the school can stay for a time to learn how to help the children. Miss Kathleen Wood has been appoint headmistress of the school. Two physiotherapists the staff have completed a three months' course in D Phelps's clinic, and an educational psychologist, out by the Foundation for Educational Research, who h studied the work being done in a large number of th clinics in America, will make St. Margaret's her hea quarters for research and for developments of the mo ment. It is hoped that the school will be in operati by the end of October.[4] The Ministries of Health a Education, the Foundation for Educational Resear the National Council for the Care of Cripples, a Parents' Associations all favour this new developme and it is planned to make St. Margaret's the foremo of similar schools in different parts of the countr giving education and care to such unfortunate childre within the means of all their parents.

TUBERCULOUS ENDOMETRITIS AND STERILITY

THE association between sterility and tuberculo endometritis has been recognised only in the last 4 years, but Halbrecht,[5] in reviewing 820 cases of sterili in women who were subjected to curettage in Tel-Av has found that 45 had tuberculous endometritis. Th diagnosis was confirmed by positive culture in 4 ca and by animal inoculation in 3. Unfortunately, n account is given of the histological criteria for th diagnosis, but he suggests that the number of positi findings would have been greater if all patients had be submitted to a total curettage rather than to a parti or diagnostic endometrial biopsy. As a corollary h investigated 54 women in whom salpingography showe the tubes to be partially or completely blocked; th findings on curettage demonstrated that 18 of these ha tuberculous endometritis.

---

[1] Lancet, 1946, i, 694.

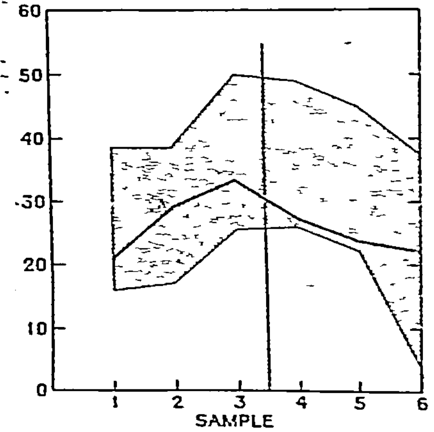
[2] Fulton, F., Taylor, J., Wells, A. Q., Wilson, G. S. Brit. med. J. 1941, ii, 759.

[3] As announced in these columns last week (p. 332) Dr. Carlson is lecturing at the London School of Hygiene on Sept. 9, at 4 P.M.

[4] In the meantime inquiries should be addressed to Miss Kathl Wood, Coombe House, Croydon.

[5] Halbrecht, I. Schweiz. med. Wschr. 1946, 76, 708.

ceptions (Hoelzel 1942), ,many workers support the ea that stress causes reduced secretion and delayed nptying. Wolf and Wolff (1942), in their observations "Tom," and Wolff and Mittelman (1942), in further- servations on cases of gastritis, duodenitis, and peptic cer, distinguish between anxiety associated with stility, resentment, or aggression, which causes hyperfunction of the stomach, and anxiety associated with depression, which causes hypofunction. They note the parallel between gastric secretion and salivary secretion. The mouth dries up with fear, but people spit with rage. Hinds Howell (1941) found that test-meal curves ring air-raids were so irregular as to be useless, but unfor- nately details were not published. Since no unselected mples could be found in the literature, it occurred to ıe of us to do fractional test-meals on students awaiting ıe results of the M.B. examination, to give the results ter the first hour and to follow the curves for a further our to see if passing or failing had any influence. Twenty udents volunteered, of whom sixteen passed and four iled. The technique used was to draw off as much of ıe fasting secretion as possible and then to give a gruel ıeal. All the subjects either went without lunch or had ı early light carbohydrate meal. The tubes were passed etween 4 and 4.30 P.M., samples were removed at)-min. intervals, and the examination results were nounced at 5.15 P.M.



aph showing mean free HCl of 16 students who assed and 4 who failed in their examinations. haded area gives range of mean ±2 S.E. in the 16 who passed; black line gives mean of 4 who failed; ertical line gives time of announcement of xamination results.

The accompanying table and figure show the exact me relationship of the samples to the announcement of ıe results. There is no evidence of hypersecretion and o significant departure from expectation. It might e argued that the tension was not great enough. We o not believe this is valid, as during the first hour there as a definite tense atmosphere in the room, and it was eliberately increased by sending messengers out to ıquire if all the results were yet ready, and by consulting ıeets of foolscap. Possibly a larger sample might pick ut the occasional abnormal case, but evaluation would ıen be difficult.

SUMMARY

Fractional test-meal curves on twenty normal medical udents for an hour preceding and an hour following the eclaration of examination results showed no abnormality hich could be ascribed to anxiety, depression, or lation.

REFERENCES

lvarez, W. (1929) *J. Amer. med. Ass.* 92, 1231.
eaumont, W. (1833) Experiments and Observations on the Gastric Juice, Plattsburgh.
annon, W. B. (1909) *Amer. J. med. Sci.* 137, 480.
avies, D., Wilson, A. (1937) *Lancet*, ii, 1353.
unbar, H. F. (1946) Emotions and Bodily Changes, New York.
inds Howell, C. A. (1941) *Brit. med. J.* ii, 473.
oelzel, F. (1942) *Amer. J. digest. Dis.* 9, 188.
ennings, D. (1942) *Lancet*, i, 365.
ammerer, H. (1818) Thesis, Stuttgart.
elye, H. (1943) *Lancet*, i, 252.
tewart, D. N., Winser, D. M. de R. (1942) *Ibid*, i, 259.
olf, S., Wolff, H. G. (1942) Human Gastric Function, London.
olff, H. G., Mittelman, B. (1942) Psychosomatic Med. 4, 5.

In England Now

A Running Commentary by Peripatetic Correspondents

ONE of your correspondents has urged a more careful estimate of the results of surgery by following up the later histories of patients. Then your leading article of August 17 has drawn attention to the grisly state of some of the chronic sick, as discovered by a survey undertaken by the Institute of Almoners, and among these "chronic sick" were men and women dying of carcinoma in varying degrees of misery. The surgery of carcinoma has to some extent already been checked by follow-up, and judging by the number of forms now filled in about these patients the follow-up will be more accurate and detailed and more widespread than heretofore. I have however an uneasy feeling that the form of the accepted carcinoma follow-up leads to surgery which often adds to the unhappiness of our patients instead of alleviating it.

The accepted criterion of success in the treatment of carcinoma is the survival of the patient for an arbitrary period of years. Whether the patient is happy and comfortable or in misery and pain is not recorded: his mere existence alive is regarded as proof of success. Because "survival" is an unpleasant word, hinting that life may be present but not necessarily very enjoyable, it is not used in this connexion; the fallacious but comforting word "cure" is used in its place. A surgeon will blithely record in public the results of his treatment of carcinomatous patients as a three, four, or five year "cure," lumping together the remainder as "recurrences" and therefore failures. Yet the end of a patient with a recurrence may be a good deal pleasanter than that of a patient "cured." The comfort of the patient has become obscured by the attempt to eradicate a disease, an attempt based on pathology and checked by statistics, both of which ignore the happiness of the sufferer who dies in a different institution from that which treats him at first. The introduction of beds for the chronic sick and dying in the same building where primary treatment is undertaken will go some way to humanising the statistics: till then it might be a good idea to record the results of the treatment of carcinoma as "alive," "with or without recurrence," "comfortable or miserable."

* * *

Almost certainly I qualify by residence and occupation to write as a practitioner in a Medically Overcrowded Area (M.O.A.). There is in London one indubitable M.O.A., the one near Cavendish Square; but in present controversy it does not seem to count, and a substantial park and famous wood separate mine from it. Mine is not what it was. There are many more people to the house and perhaps fewer doctors to the street than there were, but I know of six G.P.s and as many dentists within 200 yards of me—there may be more; houses are not thick on the ground so the proportion must be fairly high; and besides we have been "spoken of," mentioned in the same breath with such hotbeds as Bournemouth.

And that brings me to the point. It is time, I think, that someone in one of these strange places spoke up, for nowhere does experience more belie repute; and repute so readily assumes the voice of authority. The whole country now knows our reputed habits. "Wheresoever the carcass is there shall the vultures be gathered together" puts them in a nutshell. Spying from afar the congregation of the wealthy we buy ourselves into a practice on borrowed thousands and have then no choice but to get our money back by prostituting our science and art. Well may we yearn for a Charter of Liberty to deliver us from this bondage! Well may the country's awakening social conscience move it to arise and cleanse the Augean stable! And if Augean stables have parasites, and parasites have socks, well may they be compelled to pull them up and do a bit of honest work elsewhere!

So much for repute. Now for experience. Twenty-five years ago your present peripatetic—no, the third person is impossible. Once upon a time I, being young, eager, married and offspringing, but slightly mellowed by over four years of war, looked about for somewhere to live. We had sampled the M.O.A. as a living-place and

Special Articles

FRACTIONAL TEST-MEALS ON STUDENTS AWAITING EXAMINATION RESULTS

MICHAEL FLOYER
M.B. Camb., M.R.C.P.

DENYS JENNINGS
B.M. Oxfd, D.M.R.E. Camb.

From the Medical Unit of the London Hospital

THE association between disturbance of the guts and emotional tension has been recognised since the beginnings of literature. Older authors attributed emotional instability to weak guts. The pendulum has now swung over, and gastroduodenal and colonic disorders, both functional and organic, are popularly ascribed either to excessive mental strain or to a temperament badly adjusted to normal strains.

Typical evidence for this change of view is the alleged frequency of gut disorder following mental tension. A good example is Stewart and Winser's (1942) paper on the increase in perforated peptic ulcer during air-raid periods. There are many other lines of evidence, such as the undue frequency of certain temperamental types among ulcer patients (Davies and Wilson 1937), observations on the effect of emotion on quite a large number of patients with gastric fistulæ, ranging from Beaumont (1833) to Wolf and Wolff (1942), observations on experimental animals with fistulæ or with transpa abdominal windows, X-ray observations on experimental animals and on normal and psychotic human subjects and finally test-meal observations on mental patients and on subjects suffering from emotional stress or in which stress is induced under hypnosis. Alvarez (1929) has written a very readable review, and Dunbar (194 gives a modern bibliography.

Various mechanisms for the production of peptic ulcers by emotion have been suggested. The idea that interruption of normal impulses from the brain, or the production of abnormal ones, may be responsible back to Kammerer (1818), who tried to explain the association between brain lesions and gastric ulcers. The theory of hypothalamic stimulation in its modern form was favoured by Stewart and Winser (1942) and severely criticised by Jennings (1942). Selye (19 reaffirmed the claims of his "alarm" reaction of ischæmia followed by dilatation of capillaries and sta *Cannon's (1909) view of stasis and fermentation of* food producing irritation, gastritis, and duodenitis is possibility, and so is the idea of retrograde intestinal movements associated with colonic irritability.

As pointed out by Jennings (1942), the difficulty of the theory of hypothalamic stimulation is that, with rar

RESULTS OF FRACTIONAL TEST-MEALS IN SIXTEEN STUDENTS WHO PASSED AND FOUR WHO FAILED IN THEIR EXAMINATIONS (17–20)

A.—PASSED

No.		Fasting and initial samples			Time relationship of samples to announcement of results						Final samples	
					Minutes before			Minutes after				
					15	10	5	5	10	15		
1	F	70	72	75	..	75	..	..	80	..	60	..
	T	120	114	115	..	110	..	..	100	..	82	..
	S	+	+	+	..	+	..	..	+	..	+	..
	B	tr	tr	–	..	–	..	..	–	..	–	..
2	F	0	20	25	..	..	48	..	..	52	48	..
	T	20	40	48	..	..	65	..	..	65	65	..
	S	tr	+	+	..	..	+	..	..	+	–	..
	B	–	–	–	..	..	–	..	..	–	–	..
3	F	0	12	32	..	..	28	..	..	22	22	..
	T	10	30	52	..	..	42	..	..	38	38	..
	S	–	+	+	..	..	+	..	..	tr	tr	..
	B	–	tr	–	..	..	–	..	..	–	–	..
4	F	0	0	25	..	..	33	..	..	22	22	..
	T	10	18	45	..	..	54	..	..	47	43	..
	S	–	+	+	..	..	+	..	..	–	–	..
	B	–	–	–	..	..	–	..	..	–	–	..
5	F	18	12	36	..	..	17	..	..	30	15	..
	T	38	30	58	..	..	32	..	..	52	30	..
	S	–	+	+	..	..	+	..	..	+	–	..
	B	–	–	–	..	..	–	..	..	–	–	..
6	F	..	48	17	0	..	..	0	..	..	0	0
	T	..	70	35	20	..	..	25	..	..	30	20
	S	..	+	+	–	..	..	–	..	..	–	–
	B	..	+	+	+	..	..	+	..	..	+	+
7	F	..	38	20	45	..	..	50	..	..	41	38
	T	..	58	35	70	..	..	72	..	..	60	50
	S	..	–	+	+	..	..	+	..	..	–	–
	B	..	–	–	–	..	..	–	..	..	–	–
8	F	..	0	0	22	..	..	10	..	..	12	..
	T	..	8	24	40	..	..	27	..	..	28	..
	S	..	–	+	+	..	..	–	..	..	–	..
	B	..	–	–	–	..	..	–	..	..	–	..
9	F	..	37	18	..	33	..	..	37	..	0	..
	T	..	70	52	..	65	..	..	61	..	30	..
	S	..	+	+	..	+	..	..	+	..	+	..
	B	..	–	–	..	–	..	..	tr	..	+	..
10	F	..	0	0	..	25	..	..	35	..	32	..
	T	..	15	17	..	48	..	..	52	..	40	..
	S	..	–	+	..	+	..	..	+	..	+	..
	B	..	–	–	..	–	..	..	–	..	–	..
11	F	..	40	48	..	50	..	..	55	..	52	..
	T	..	58	65	..	70	..	..	72	..	68	..
	S	..	–	–	..	+	..	..	–	..	–	..
	B	..	–	–	..	–	..	..	–	..	–	..

A.—PASSED (*continued*)

No.		Fasting and initial samples			Time relationship of samples to announcement of results						Final samples	
					Minutes before			Minutes after				
					15	10	5	5	10	15		
12	F	..	10	6	..	25	..	..	22	..	18	..
	T	..	42	27	..	50	..	..	50	..	42	..
	S	..	–	+	..	+	..	..	+	..	+	..
	B	..	–	+	..	+	..	..	–	..	–	..
13	F	..	18	12	..	45	..	..	42	..	60	..
	T	..	30	30	..	60	..	..	58	..	80	..
	S	..	–	+	..	+	..	..	+	..	+	..
	B	..	–	–	..	–	..	..	–	..	–	..
14	F	..	35	64	..	58	..	..	72	..	78	..
	T	..	58	82	..	80	..	..	88	..	90	..
	S	..	+	+	..	+	..	..	–	..	–	..
	B	..	+	–	..	–	..	..	–	..	–	..
15	F	..	42	25	..	..	50	..	..	60	52	..
	T	..	67	48	..	..	28	..	..	65	76	..
	S	..	–	+	..	..	+	..	..	–	–	..
	B	..	+	+	..	..	–	..	..	–	–	..
16	F	..	60	38	..	..	48	..	..	20	16	..
	T	..	80	52	..	..	64	..	..	60	30	..
	S	..	–	+	..	..	+	..	..	+	–	..
	B	..	–	+	..	..	+	..	..	–	–	..
Arithmetic mean of free HCl					37·6			38				
Standard error of mean					6·2			5·6				

B.—FAILED

No.		Fasting and initial samples			Minutes before 15	10	5	Minutes after 5	10	15	Final samples	
17	F	..	0	0	22	..	..	0	..	..	0	
	T	..	8	8	40	..	..	25	..	..	20	
	S	..	–	–	+	..	..	–	..	..	–	
	B	..	–	–	–	..	..	+	..	..	–	
18	F	..	..	35	34	..	..	50	..	..	50	
	T	..	..	53	44	..	..	65	..	..	65	
	S	..	..	+	+	..	..	+	..	..	–	
	B	..	..	–	+	..	..	+	..	..	+	
19	F	..	32	48	..	–	..	..	22	..	22	
	T	..	60	68	..	20	..	..	37	..	42	
	S	..	–	+	..	+	..	..	–	..	–	
	B	..	–	–	..	–	..	..	–	..	–	
20	F	..	30	32	..	42	..	..	37	..	25	..
	T	..	50	55	..	62	..	..	58	..	40	..
	S	..	–	+	..	+	..	..	–	..	–	..
	B	..	+	+	..	–	..	..	–	..	–	..

F, free HCl; T, total acidity; S, starch; B, bile.

th, preferably representing their national health inistrations." The assembly will meet annually and pecial session and determine its own place of meeting dvance. Among its functions is the authority to pt conventions or agreements by a two-thirds vote; nbers undertake to accept such conventions within teen months or furnish reasons for non-adoption. assembly may also adopt regulations on quarantine uirements and standardisation of nomenclatures, gnostic procedures, and biological and pharmaceutical ducts (including their labelling and advertising); such regulations will come into force at a given date ess specifically rejected by members. These are and important powers, designed to ensure uniformity obviate delay experienced in the past, but they y excite opposition if too much is attempted too ickly.

The executive board is to consist of 18 persons desig- ted by 18 delegates elected by the assembly, holding ice for three years and eligible for re-election. The ard will meet at least twice a year, act as the executive gan of the assembly, and take emergency measures. e director-general, who is nominated by the board d appointed by the assembly, has direct access to vernment departments and nominates his own staff, e conditions of whose appointment are to conform those of other United Nations organisations.

The location of the headquarters is to be decided the assembly, and it seems likely that it will be in rope. Regional committees and offices may be set up. soon as possible the Pan-American Sanitary Bureau to be integrated—whatever that may mean—with the orld Health Organisation, by mutual consent. Annual, idemiological, and other reports are to be made by ember-states to the World Health Organisation. The nstitution, which may be amended by a two-thirds ajority of the assembly, enters into force when 26 embers of the United Nations have become parties to : it is hoped that this number will be reached before une, 1947, when the first assembly is expected to meet.

INTERIM COMMISSION

The Arrangement provides for the immediate establish- ent of an Interim Commission of 18 persons designated y that number of States. Its duties are to convoke he first session of the World Health Assembly within ix months of the constitution coming into force; to rovide, for the agenda of the meeting, proposals on rogrammes and budget, the location of headquarters, egional areas, and staff regulations; to prepare an agree- ent with the United Nations; to take over the functions f the Health Organisation of the League, the Paris ffice, and the Health Division of UNRRA relating to the nternational sanitary conventions; to negotiate with he Pan-American Sanitary Bureau and other inter- ational organisations; to prepare for a revision of the anitary conventions and the lists of causes of death; o establish liaison with the commission on narcotic rugs and other commissions of the Economic and ocial Council; and to consider any urgent health problem rought to its attention by governments. The Interim ommission is to derive its funds from a loan by the nited Nations, and governments may make advances o it against their future contributions to the World ealth Organisation.

The commission[2] met in New York immediately after lection by the International Health Conference and lected Dr. Stampar (Yugoslavia) as chairman and Dr. B. Chisholm, late deputy Minister of Health of Canada, as executive secretary; it also set up committees on administration and finance, epidemiology and quarantine, and relations with other bodies. It is understood that its next meeting, which must be held within four months, will be in Geneva early in November.

Finally, in the protocol, the signatories agreed, as between themselves, to hand over the duties of the Paris Office to the Interim Commission or the World Health Organisation on the entry into force of the protocol; and, if the Paris Office has not been dissolved by mutual consent before Nov. 15, 1949, to denounce at that time the Rome Agreement of 1907, thus finally terminating the Office. The protocol comes into force when 20 governments which were signatories of the Rome Agreement have become parties to it.

We may conclude that the United Nations have made a good start in the field of health and that unification is at least—and at last—in sight. The many tedious hours spent by the delegates in the hot-house atmosphere of New York have not been wasted.

Paratyphoid at Coatbridge

On August 22 a case of enteric fever was admitted to the burgh infectious diseases hospital, Coatbridge, Lanarkshire. Next day 3 more cases were admitted. All were bacteriologically confirmed as paratyphoid B fever. All had consumed ice-cream from a common source. On August 24 the manufacture and the sale of the ice-cream was stopped, and local practitioners were informed of the outbreak. A bacteriological investigation revealed that an employee who made and sold the ice-cream was excreting *Bact. paratyphosum B* in his stools. It was not possible to determine the total quantity of ice-cream likely to have been infected, but it is estimated that at least 1500 cones and wafers were sold on one day. The ice-cream was hawked within a certain area of the town, and the cases are confined to that area. The total number of cases up to August 30 was 74, the majority being in children.

Infectious Disease in England and Wales

WEEK ENDED AUGUST 24

Notifications.—Smallpox, 0; scarlet fever, 665; whooping-cough, 2058; diphtheria, 285; paratyphoid, 66; typhoid, 36; measles (excluding rubella), 2140; pneumonia (primary or influenzal), 299; cerebrospinal fever, 39; poliomyelitis, 30; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 52; puerperal pyrexia, 138; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from enteric fever, 2 (0) from measles, 8 (0) from whooping-cough, 3 (0) from diphtheria, 29 (2) from diarrhœa and enteritis under two years, and 7 (2) from influenza. The figures in parentheses are those for London itself.

Birmingham reported the death from an enteric fever.

The number of stillbirths notified during the week was 242 (corresponding to a rate of 28 per thousand total births), including 30 in London.

"... There was another occasion during the [Hot Springs] Conference when the delegates of the other nations appeared to be deeply impressed by the clear indication of the trend of thought on food and nutrition in Great Britain. It was when an account was given of the war-time food policy we have implemented here and of the various measures we have adopted to distribute foods according to nutritional needs. After this meeting Professor André Mayer, the distinguished French physiologist, took me by the arm as we walked along one of the long corridors and said in his characteristically charming manner, 'M. Drummond, Vous Anglais, vous faites toujours les révolutions avec tant d'élégance!' "—SIR JACK DRUMMOND, F.R.S., speaking at the Royal Institution on June 2.

---

[2] Mr. Tange (Australia), Dr. Paula Souza (Brazil), Dr. Routley (Canada), Dr. Sze (China), Dr. Shousha Pasha (Egypt), Dr. Leclainche (France), Dr. Lakshmanan (India), Dr. Togba (Liberia), Dr. Mondragon (Mexico), Dr. van den Berg (Netherlands), Dr. Sandberg (Norway), Dr. Paz Soldan (Peru), Dr. Medved (Ukrainian Soviet Socialist Republic), Dr. Krotkov (Union of Soviet Socialist Republics), Dr. Melville Mackenzie (United Kingdom), Dr. Parran (United States of America), Dr. Guzman (Venezuela), Dr. Stampar (Yugoslavia).

liked it. It was a fit place for bringing up a family, not too far from our own parents and from my hospital job, and there was a house going reasonably cheap. There were shoals of doctors about, so one more could matter little to them; and just possibly I should make a living.

We bought the house. We let the top half to friends and I put a plate on the door. I never sat there like a hungry spider twitching the threads of the web. I went out and did jobs—paid and unpaid, hospital, welfare-centre, pensions-board, and the like—and slowly friendly doctors put me in the way of making a practice. Some of the friendly ones were consultants a few years my senior living in or near the M.O.A. and needing a "real doctor" for their children; others were "real doctors" themselves, living farther off. The patients were almost always immigrants—almost never from that day to this the ex-patients of a local fellow-vulture. They were very often interesting and pleasant people, very seldom rich.

The fellow-vultures, after surveying the new bird for a suitable time, actually invited it to join the Vulturine Society—a very friendly gesture when you think what predatory brutes they must really be. "The Vulturine" meets monthly in the winter season in the actual eyries of its members. The eyries turn out to be quite ordinary nests, the hen-vultures who receive us seem quiet, domesticated fowls enough; and where are the tell-tale fragments of bone, fur, or feather that should reveal to a quick eye the horrid hidden sources of their daily meat? How inconspicuous are our host's beak and talons! One might almost believe that even he—and if one almost did one would be right because of course (to quit fooling) neither he nor the other members of the "Vulturine" are any more predatory than I am myself. They are decent ordinary practising doctors, not perhaps without certain qualities of mind and outlook which have drawn them to practise in the M.O.A., but quite obviously neither parasites, charlatans, go-getters, nor prostitutors of their art and science.

* * *

When I die I shall leave an annual prize to the graduate who can give the most bizarre reason for taking up medicine. I might have been a pretty good starter myself. The week before I began at college I filled in a curriculum form for some distance before I discovered that it wasn't the one for arts after all. Somewhere in the college files there is a curriculum form for medicine (1939–40) with a teeny tear at one edge to show how far I got before it struck me that it might be a better stunt after all; whereafter I went straight to a second-hand book shop and bought a textbook of pathology by Lazarus-Barlow (1902 edition) for 1s. 6d. and read it!

The closest rival in my year would be the anatomy medallist, who, during his school years, saw a woman have hysterics in the street when a forearm and head were thrown at her from the upper floors of the medical school. This incident greatly impressed on him the power of the healers over the laity and fired him with the ambition to emulate this feat. Runner-up would be the old sea captain who had been left a substantial legacy on condition that he embarked on the study of medicine. Since the legacy was to stop when he qualified, the old boy spun out his course to 14 years until he accidentally gave three right answers running in his finals and was passed. By the time he had decided to get himself struck off the Register to be able to start again, he found himself enjoying a country practice so much that he bought it with the savings from his legacy instead.

Lest any of you should be tempted to overwork your imaginations, I might add that I am still in my twenties and that the prize, in any case, will be quite worthless.

* * *

"Typhoid Outbreak in Scotland: An Ice-cream 'Carrier'?" says the *Manchester Guardian*. If an ice-cream carrier is a person who harbours ice-cream in his body without manifest symptoms (as Dorland's *Dictionary* would lead one to suppose) most of the children in our part of London must come in that category just now, for the Strand is only second to Southend-on-Sea in the number of ice-cream sellers per sq. inch.

Public Health

THE WORLD HEALTH ORGANISATION AND ITS INTERIM COMMISSION

NEVILLE M. GOODMAN
M.D. Camb., D.P.H.
DIRECTOR OF HEALTH, EUROPEAN REGIONAL OFFICE, UNRRA

THE work of the International Health Conference in New York[1] can now be reviewed in the light of the documents signed at its conclusion. These documents consist of (1) the constitution of the World Health Organisation, (2) an Arrangement establishing an interim commission, (3) a protocol concerning the International Office of Public Health, Paris, and (4) the final act of the conference. All four were signed by almost all the representatives of the 51 member-states of the United Nations and the 10 non-member representatives attending as observers; but the first and third were in most cases signed subject to ratification.

CONSTITUTION

The constitution, after an impressive preamble, defines the objective of the World Health Organisation as "the attainment by all peoples of the highest possible level of health." The first of the organisation's functions is to "act as the directing and coördinating authority on international health work." Among the twenty-one other functions are strengthening health services; furnishing necessary aid in emergencies; providing health services to special groups, such as trust territories; establishing epidemiological and statistical services; proposing conventions and regulations; promoting maternal and child health, mental health, research, technical training, and health propaganda; adopting international standards for biological, pharmaceutical, and food products, and for diagnostic procedures, public health practices, the nomenclature of diseases, and causes of death; and promoting the improvement of nutrition and environmental hygiene. Services will be rendered *only at the request* of governments, and coöperation with other agencies in the various fields is enjoined. The scope is thus even wider than that of the Health Organisation of the League of Nations, the Paris Office, and the Health Division of UNRRA combined, though obviously all these functions will not be taken up from the beginning. Already alarm has been expressed at the proposal to standardise diagnostic procedures, but it seems that all that is intended is the standardisation of laboratory techniques, such as that of the serodiagnosis of syphilis, formerly pursued by the League of Nations.

Membership is open to all States. A simple majority vote of the World Health Assembly will admit any State not accepting membership by signing the constitution as a member or observer at the International World Conference (Spain, Germany, and Japan were the only States not invited to the conference). Colonies or other territories not responsible for their international relations may become associate members on application by the "mother" country; their representatives "should be chosen from the native population"—a clause which may lead to embarrassment—and their rights and obligations will be determined later.

DIVISION OF DUTIES

The work will be carried out by the World Health Assembly, an executive board, and a secretariat. Member-states will be represented in the assembly by not more than three delegates, with alternates and advisers; delegates "should be chosen from among persons most qualified by their technical competence in the field of

---

1. See *Lancet*, 1946, i, 970; ii, 58, 99, 142.

ed by workmen's compensation, in the history of trial cases, would be absent in those cases noted physical training or "strain" in the Services. iger[1] noted these cases in Service personnel and ılated the theory of a reflux of urine down the during effort. However that may be, it may be rtant that the rôle of muscular exertion in causation nore precisely defined in, at any rate, some of the s.

G. WHITWELL.

tord.

THE SISTER-TECHNICIAN

R,—With regard to the article on Democratic Nursing ıe issue of July 6, we feel it very necessary to protest ngly against one of Mr. Cohen's suggestions. This ıat married sisters working in health centres should e a short training in the duties of a laboratory nician. If sisters trained in this way are responsible the routine investigations the standard of the ratories in the health centres will not be a high one, the work of a technician is highly specialised and is y acquired by many years of experience. In the ıion of this committee, the laboratories should be fed with trained technicians to obtain a satisfactory ıdard of work.

PHYLLIS LANGAN PLUMBRIDGE
Secretary of the Committee.

ondon General Medical Branch, Association
of Scientific Workers.

VARIATION IN THE FEMALE PELVIS

SIR,—In connexion with the article by Dr. C. Nicholson d Mr. H. Sandeman Allen (August 10), I should like to nment on a few variations in the female pelvis which observed in the X-ray department of Shrodells spital, Watford. The patients here are probably presentative of the London suburban population and long to all social strata, being referred for pelvimetric alysis by private practitioners, obstetric specialists, tenatal clinics, and maternity homes in the neighbourod.

A striking feature is the comparative rarity of the pical android pelvis, as described by Caldwell and oloy, with all its associated features—the acute ıgle of the forepelvis, the short anterior transverse ameter, the long and narrow sacro-sciatic notch, the ort posterior sagittal diameter, the deep symphysis ıbis, the narrow subpubic angle, the wide and straight rum, and the deep true pelvis. The incidence of pelves owing at least a few of these characteristics was not re than 6–7% of the total of 1200 pelves examined. In ollow-up of the subsequent course of delivery we found surprisingly high need for interference and assistance this type. While the total need for interference in all ses delivered at home by practitioners and in nursing mes or hospitals was around 11%, the pelves with droid tendencies required assistance in 62%.

To determine an android hind-pelvis we use a much wer figure for the sagittal index than that given by icholson and Allen for their scutiform type. We do t consider the arbitrary figure of 30 for the upper vel of the index as really indicative of a short postgittal diameter if the index for the whole series of 7 cases is not higher than 35·6. The figure which we ipulate as the upper level for the index denoting a ırrow android hind-pelvis is 25. We feel that the clusion of pelves with indices above this figure would ad to very slight variations of the round type being nsidered among the android group. This would lead erroneous conclusions if an assessment of the course labour in relation to pelvic type is attempted.

Table VI of Nicholson and Allen, which gives the athematical basis for their conclusion that pelvic type as no influence on the course of labour, shows however -be it statistically significant or not—that the scutiform elvis required assistance in 46·5% of all pelves of this pe, while the narrow (anthropoid) only required interrence in 32·3%, the flat in 37·5%, and the round in 3·7% in all cases of their respective types. I am connced that if a lower sagittal index were applied to parate the scutiform group from the rest, and thus d near-gynæcoid pelves be excluded, then the percentage sistance rate in the first group would rise considerably.

The correlation coefficient between the sagittal index and the ischial spine distance is very near the limit of being statistically significant and would suggest that with a low sagittal index occasionally an interspinous narrowing could be expected, as is actually the case in the funnelling of the true android type.

I do not think that any decisive conclusions can be derived from consideration of the course of delivery in about 30 cases of the scutiform type. This type embodies only one feature of the android pelvis, and the quantitative limits for inclusion in this type are drawn too widely. From a radiological point of view I do not feel it justifiable to diagnose an android pelvis from the comparative relationship of two segments of one longitudinal diameter in the inlet plane alone, as was done in the case of the scutiform pelvis. I firmly believe that consideration of all the other characteristics at different levels of the pelvic cavity is at least as important, if not more so, and enables one to arrive at a usable prediction about the probable course of labour. If typical android features are present in various parts of the pelvic canal a prolonged and difficult labour is to be expected in the majority of cases in which only the slightest disproportion coexists.

Pinner.

J. RABINOWITCH.

"CURARINE"

SIR,—Some confusion has arisen in the nomenclature of alkaloids from curare which it is important to resolve in view of the renewed interest shown in curarising drugs.

The word curarine was applied by Boehm in 1897 to an amorphous alkaloid which he isolated from gourd (calabash) curare. From tube-curare he isolated a chemically different amorphous alkaloid which he called tubocurarine, and King in 1935 described the isolation and chemical structure of a highly active crystalline alkaloid from tube-curare which he regarded as the crystalline form of Boehm's preparation and applied the name *d*-tubocurarine chloride to it. Dutcher has recently isolated the same *d*-tubocurarine chloride from native curare prepared from *Chondrodendron tomentosum*.

Ranyard West, whose work on the treatment of spastic rigidity, Parkinsonism, and tetanus with curarising drugs in 1932–36 and subsequent years aroused so much interest, worked at first with crude native curares. Later he used an amorphous alkaloid called "curarine" which King prepared from *Strychnos toxifera*, a liane known to be used in the preparation of calabash curare in British Guiana. West ran into the difficulty that cases of bronchospasm often occurred during treatment and has rightly emphasised this danger. Recently, however, reports have been published in this country of nearly 2000 cases of anæsthesia in which a preparation supplied by Messrs. Burroughs Wellcome & Co., as "curarine chloride" has been used without any cases of bronchospasm occurring. The discrepancy between this series and Ranyard West's reports is due to the fact that the drugs used were different; the Wellcome "curarine chloride" is crystalline *d*-tubocurarine chloride derived from tube-curare.

Messrs. Burroughs Wellcome & Co., in naming their preparation "curarine chloride," were actuated by a desire to avoid a polysyllabic name. The term curarine would be better dropped entirely, leaving new alkaloids of this class to carry their appropriate adjectival prefixes, which Messrs. Burroughs Wellcome & Co. now propose to do.

Wellcome Physiological Research Laboratories,
Beckenham, Kent.

J. TREVAN.

AID TO DEFÆCATION

SIR,—Your correspondent, C. W. B. (August 10), advises rubbing the lower back in order to secure an easy defæcation. This is indeed a treatment of value, but it is only successful in suitable cases.

In every great cattle-market you will find wise farmers testing the alimentary canal of a cow or steer they wish to buy by scratching the sacral area of its spine with their walking-stick. This commonly produces an evacuation, and from this excrement the experienced old farmer decides on whether to bid or to abstain.

This method is, however, of less efficacy in the case of horses, and is practically valueless in the case of constipated dogs. The nerve stimulus acting upon the

---

[1] Slesinger, E. G. *Proc. R. Soc. Med.* 36, 323.

Letters to the Editor

TREATMENT OF MENINGITIS

SIR,—There is much truth in Dr. Wilfrid Gaisford's remarks (August 17) against intrathecal penicillin and in favour of intensive systemic therapy in "non-traumatic meningitis." But his statement is an over-simplification of the therapeutic problem, since he does not draw any distinction between (1) the various bacterial forms of purulent meningitis, and (2) the different extent of penetration of the blood-brain barrier by serum, sulphonamides, and penicillin in the presence of acute meningitis. Neither of these factors can be ignored in the treatment of meningitis.

Recent pronouncements appear to have given rise to a widespread impression that intrathecal penicillin must at once be given whenever spinal puncture reveals a turbid fluid. "Treatment by penicillin is indicated for all meningococcal cases," we are told.[1] The "introduction at once of intrathecal penicillin if the lumbar tap is turbid" is recommended in addition to sulphonamides and systemic penicillin.[2] Surely the problem has got a *bit out of focus! Is it already forgotten that* prompt and adequate sulphonamide therapy is rapidly curative in about 95% of meningococcal cases? Is there any evidence so far that the cure of these can be hastened by penicillin? I do not think so, nor have I any reason to believe that any considerable part of the other 5% can be saved by penicillin either.

Since the meningococcal form is the most common form of bacterial meningitis, the recommendation for intrathecal penicillin on discovery of a turbid lumbar tap results in much unnecessary intrathecal injection. In the great bulk of such cases doubtless no harm will come of it, but unless the technique is invariably meticulous, which is a practical impossibility, the potential danger is by no means negligible. It is not only that the impurities of penicillin are irritating to the meninges and may even be non-sterile, but the introduction of grave extraneous infection—e.g., *Streptococcus viridans*, coliforms, or *Pseudomonas pyocyanea*—is more common than is generally realised.

In pneumococcal meningitis the balance of evidence at present appears to be in favour of intrathecal and systemic penicillin as well as large doses of sulphonamides. But the evidence for intrathecal penicillin is not so strong as to justify a rush to it without prior examination of a smear from the spinal fluid.

When staphylococcus meningitis is suspected, intensive therapy by all routes may be justified without delay, but this is a rare condition and there is usually some clinical guide to the diagnosis.

It was a great relief, a few years ago, to get rid of the trauma and risks associated with routine intrathecal injections in the treatment of meningitis. Before we return to them let us consider well whether any real *advantage is to be gained.*

London, S.E.13. H. STANLEY BANKS.

SIR,—In his letter of August 17 (p. 253) Dr. Gaisford condemns—in no mild terms—the use of intrathecal injections of penicillin for nontraumatic meningitis. He states that meningitis is a systemic disease and intensive systemic therapy is the best form of treatment. I think most people a short while ago would have been in complete agreement with him; the reason for the "retrograde step in therapy" is surely that patients went downhill steadily and even died when treated on the lines so ably advocated. The observant medical attendants then retraced their steps and tried intrathecal medication, with the result that those patients not beyond recall recovered.

There is a theoretical obstacle to systemic treatment; though not merely banausic it is often referred to as the "blood-brain barrier," and though merely a theoretical obstacle for many of the sulphonamides (as Dr. Gaisford argues with effect) it is a very real handicap when the large molecule of penicillin has to be taken into account.

Epping, Essex. FRANK MARSH.

---

[1] Penicillin, London, 1946, p. 273.
[2] *Ibid*, p. 276.

WATER-SUPPLIES

SIR,—In the *Times* of August 10 I read that Cumberland County Council has been reviewing present and potential supplies of water to the county. Presumably that fortunate county of lakes and [illegible] has water enough available for all time.

But should not some authority at the highest [illegible] be actively inquiring into the available water of [illegible] whole country in view of widespread housing schemes which will entail the provision of large new water-supplies in town and country alike? As regards the country cottagers in village or scattered country districts draw their moderate water-supply from shallow wells (except when these run dry) in quantities limited by habit, by the labour of working buckets and windlass or pump and by what their well may yield at a given time. If all these cottagers and all the new ones promised or to have water by pipe and taps (hot and cold), baths and bathrooms, and water-flushed sanitation, an enormous quantity of new water will be needed. Where is it to be found? Having knowledge of country life, I estimate very roughly that a cottage family at present supplied by a draw-well would, if afforded the "amenities" proposed for baths, w.c.s, and kitchen taps, soon come to use 10, 15, or 20 times the volume of water previously used in daily life. A single lavatory flush runs off [illegible] gallons. The total will amount to very large figures.

I am not enough of a geologist to know whether or where this water can be found, but I read with apprehension from time to time of falling rivers and failing streams whose dwindling flow is attributed to heavy pumping from new deep wells for water undertakings or industry. And it is well known that the water level over the clay of the London basin, for example, has similarly been a good deal lowered in recent years.

Will it not be necessary to take very far-reaching steps to conserve vastly more of the water that falls from the skies, if we wish to use so much more? The question may become one of urgency. Very few of us even conserve the rain that falls on our houses. And from streets, roads, land drainage ditches, and the like we run it off to the sea as fast as we can.

The Cumberland County Council had a comparatively simple problem to deal with: but is it not clear [illegible] we need a general survey of the present and potential water-supplies of the whole country?

Upavon, Wilts. E. W. AINLEY-WALKER.

NON-SPECIFIC EPIDIDYMITIS IN INDUSTRY

SIR,—The recent articles and correspondence on non-specific epididymo-orchitis (*Lancet*, 1946, i, 775, [illegible], 834, 870) raise questions of interest to industrial medicine.

It is not uncommon in my experience to see workmen who develop mild epididymal pain after exertion. The history is usually that, while lifting, pain is experienced over one spermatic cord, and shortly afterwards in the testicle on the same side. As the pain does not quickly settle the workman soon reports to the works' surgery. On examination the epididymis is slightly swollen and tender and there is a tenderness of the vas. In one case the body of the testicle was also slightly enlarged and tender, and in yet another case the symptoms and signs were bilateral. Examination of the urethra and a centrifuged deposit of the urine reveals no abnormality. A supporting bandage usually relieves these patients, the symptoms disappearing in a few days. In [illegible] cases, however, the question of workmen's compensation has arisen, owing to the loss of a few days' working time. In all the cases seen, the symptoms have been mild and the principal anxiety of the patient has been over the possibility of hernia. No signs of this have been discovered.

Apart from these cases, where no obvious urinary infection exists and where the symptoms are mild, I have seen two severe cases of unilateral epididymo-orchitis. These also had, as a precipitating cause, exertion or sudden effort. One had a history of gonorrhœa six months previously, while the other case had flakes in the urine, which contained a fair number of pus cells but no organisms on direct examination.

The questions, both of urinary infection and exertion (given as a precipitating cause), have obvious bearings on these cases in industry. The possibility of bias,

ILDREN WHO SPEND TOO LONG IN BED

—I am not competent to question the accuracy e rules for sleep that Dr. McCluskie lays down in his e of August 31 (p. 302), though I should like to know he obtained his results, and whether he is giving ige or mean figures: from my own very limited cience of infants and children I should have said the individual variation covered a far greater range that of 30 minutes per 24 hours. It would also nteresting to know if a significant proportion of otic children have a history of having been kept too in bed.

particularly want to emphasise the impossibility of wing Dr. McCluskie's rules when there is more than child in the family. It might be feasible, even for unassisted mother, who has cooking, shopping, and sework to do, as well as looking after the baby, to nge her time-table so that an only child could be sed from its bed directly its 12 hours at night and or 2½ in the day were up. But when there are two nore children, one perhaps an infant on four-hourly st-feeds, the difficulty of getting Tommy up after hour's sleep in the afternoon, of keeping John y from 7.0 A.M. to 7.0 P.M. without a break, of ing Mary at 6.0 A.M., 10.0 A.M., 2.0 P.M., 6.0 P.M., and P.M. would send most mothers to the psychiatrist heir own account, before their children were so much threatened with that modern bogyman. Dr. luskie should remember that after the children have put to bed there is still their father's dinner to cook. if that is to be followed by a round of "pottings" a 10.0 P.M. breast feed, can we blame the mother does not rise at 6.0 the next morning to feed infant and wake and dress the children who have n in bed since 6.30 or 7.0 the previous evening? ould also like to know how Dr. McCluskie deals with infant who is not old enough to sit or crawl and who, n propped up in a pram with his toys around him enjoined to stay awake because this is his playtime, ceeds to fall asleep in the most uncomfortable position sible, in spite of having slept 14 hours the previous ht and 3 hours that same morning.

feel strongly on this subject because it seems to me t this is another case of the academic approach being d to a problem that is mainly human and domestic. many overworked women are unnecessarily worried heir babies' meals are 15 minutes early or late, though baby may raise no objections. Don't let us overload ir consciences further by threatening them with urotics or psychopaths for children if they treat themves to a 7 or 8 hour night or an occasional half hour's t in the afternoon. The neurotic mother, however dly she adheres to a time-table, is not likely to bring the happiest or even the healthiest children.

ondon, W.11. CATHERINE STORR.

A SYNDROME SIMULATING ACUTE ABDOMINAL DISEASE

SIR,—The paper by Mr. Goldstone and Dr. Le rquand in your issue of August 24, in which they scribe what they believe to be a new abdominal ndrome occurring in European Servicemen in West rica, was most interesting to me as their description ry closely simulates and indeed may be identical th, a condition which can also occur in West Africans d which I described last year (*J. R. Army med. Cps*, 45, 84, 201).

Briefly, among 230 cases of infective hepatitis in gerian troops seen over a period of two years, there re 7 cases which were so striking clinically, and so sely resembled each other, that I called the group the acute abdominal syndrome" and emphasised that eir importance lies in the fact that a surgeon with no perience of such cases might easily feel it his duty explore the abdomen even in the presence of jaundice.

Could it be that the cases of Mr. Goldstone and Dr. Marquand were in fact suffering from latent or subnical infective hepatitis? Although the urine was sted in each of their cases, in subicteric patients bilelts are present only intermittently in the urine, and veral specimens at intervals should be examined. Or uld it be that my cases were suffering from this new ndrome which presumably came on during the course of infective hepatitis? Whatever the answer the clinical similarity of our cases is striking and the prognosis without surgery excellent. In support of your contributors' theory of a staphylococcal origin, and for what it is worth, staphylococcal infection (pyomyositis) is very prevalent among West Africans.

In over a year's service with native Indian troops in India no similar cases were encountered.

Stoneleigh, Surrey. S. ORAM.

ENTERTAINING ALLOWANCE IN THE NAVY

SIR,—The recent Admiralty Fleet Orders (453–457) set out the entertaining allowance for Executive Officers, Royal Marine Officers, Wren Officers, Engineer Officers, and Supply Officers (Paymaster Branch), but no mention is made of the Medical Branch. For many years the Medical Branch have felt that they have a very justifiable grievance in that senior officers have no entertaining allowance and yet are expected to give hospitality to Admiralty visitors and anyone whom Parliament wishes to be entertained at the hospital. During the war years this was a very heavy item and numerous foreign and allied officers were given hospitality on many occasions. It seems that every branch of the Navy is given entertaining allowance except the Medical Branch, and this surely should be put right.

London, W.1. CECIL P. G. WAKELEY.

ADVERTISING PATENT MEDICINES

SIR,—Dr. Thompson's article of August 24 on the advertising of patent medicines in the public press "provided ammunition" in plenty for those who would attack the more unscrupulous methods adopted by the trade; but he did not touch on an aspect of the subject to which our own profession can give immediate remedy—the trading on the gullibility of doctors in the medical press. An all-wise Government now sees to it that only a limited proportion of the morning mail contains literature from the drug firms; but recollections of the bad old days before the recent war teem with pamphlets, all of them persuasive, most of them expensively got up, some of them well-written, but few of them read and almost none of them asked for.

I am well aware of the purpose and importance of this form of literature, and I neither question the wisdom of the drug firms in spending their money and their highly qualified employees' time on its production, nor the usefulness of some of it to the medical practitioner. Nor do I suggest that any of the medical journals should be without their advertisement section, quite apart from the financial side of the question. But when I look through the advertisements composed for the notice of the medical profession it seems to me that some take a great many high sounding words to say very little; others endeavour to blind the humble doctor with science, or pseudoscience; a few are frankly misleading. On the other side of the coin are all the arguments which could be advanced by the advertisers, many of which are readily admitted. The point, however, is this: that doctors are themselves susceptible to the pressure of advertisements, and to the salesmanship, as opposed to the information therein contained, and are liable to accept the over-simplification (of imperfect scientific knowledge) which is designed to sell a product. They thus contribute to the perversion (and consequent increased cost) of advertising, which is usefully employed in bringing genuine innovations to the notice of the profession, but crosses the frontier between ethics and mercenary expediency when it suggests that the opinion of an anonymous authority, or the testimony of some thousands of medical practitioners, which favours a particular product, however elegant, is a scientific fact.

Camberley, Surrey. W. LANE PETTER.

OUR HOUSES

SIR,—Mr. Saward (August 24) is quite right. Of course every house should have two w.c.s. *and* with hand-washing basins. But when the waterworks company impose an annual tax of 10*s*. on each "extra" w.c., as they do here, people have to put up with minimum essentials. Blame the waterworks, not the general public

Bristol. ARTHUR T. SPOOR.

nerves of the intestinal muscles produces an immediate reaction when the contents of the intestine are comparatively liquid; the nerves of the skeletal muscles, which are called into play in the case of hard fæces, are not affected. Cows therefore readily react, but the habitually constipated human must not expect such a result unless he regularly takes a daily meal of foods like boiled beetroot, grated raw carrot, grated raw turnip, or cabbage.

The same mechanism comes into operation when a hay rake is applied to the sacral spine of a lazy bull; in this way the muscles of the vas deferens are stimulated, but not the skeletal muscles themselves.

London, W.1. JOSIAH OLDFIELD.

SIR,—Your correspondent may be interested to know that this manœuvre was described in my *Treatment of Some Chronic and Incurable Diseases* (Bristol, 1937, p. 106), a second edition of which is in the press:

> "A wave of colon peristalsis can often be encouraged by auto-massage of the muscles just above the left posterior superior iliac spine. With the fingers of the left hand close together, a circular clockwise pressure is made over an area about the size of half a crown, the skin being fixed under the fingers. *This can be practised in the lavatory, if a motion just fails to come.*"

Incidentally this spot is one to which the descending colon sends out messages of discomfort or disease, when it will be found to be very sensitive.

I learned of this trick twenty years ago from a patient from tropical South America who had been taught the method by a native doctor with a hereditary "degree" only.

Bristol. A. T. TODD.

CIRCULATION IN THE KIDNEY

SIR,—The report by Dr. Trueta and his colleagues recalls four renal cases which I investigated radiologically at a Service hospital in India.

The men were all referred for routine intravenous pyelography, and each showed absence of function on one side. The first two showed normal function on both sides when the examination was repeated after about 48 hours. In neither case was there evidence of calculus formation or other abnormality.

The unilateral cessation of function prior to the first examination was thought to be due to restriction of fluids combined with excessive sweating in the hot climate. It was, however, difficult to understand why this was complete rather than only partial and why it was unilateral. Nevertheless, when further cases with unilateral absence of function were found in which there was no other abnormality, the examination was again repeated within 48 hours, following a more liberal intake of fluids; and two then showed restoration of normal function on both sides. There was no evidence of calculus formation on the original films in either case, and the minor calices, when visualised at the second examination, were normal.

In the light of Dr. Trueta's paper, I am inclined to think that these 4 cases were examples of the device whereby the cortex of a kidney is excluded from the renal circulation, consequent upon diminished blood-volume; in other words, the altered function was simply the result of diminished fluid intake in otherwise normal subjects in a hot climate.

Withington, Manchester. BRIAN DONNELLY.

THE LONDON COLLEGE OF OSTEOPATHY

SIR,—Mr. W. E. Tucker (July 27, p. 145) entirely discredits the theory of osteopathy, while accepting many of the manipulative procedures introduced to England by the osteopaths. His grounds for discrediting the theory are the findings of a select committee of the House of Lords. However august such a body may be, it is hardly one which should be chosen to investigate, clinically and theoretically, a form of therapy.

It is only too patent that while orthopædic surgeons and physiotherapists have adopted some manipulative methods, in large part these have been badly learned. The College sets out to teach qualified medical practitioners all that is best in osteopathy as taught and practised in America.

W. HARGRAVE-WILSON
London College of Osteopathy. Sub-Dean.

SMALLPOX AND VACCINATIO

SIR,—Dr. Boul and Dr. Corfield (August
are to be congratulated on the success with
outbreak of smallpox in Essex in the early
year was controlled and a major epidemic
This is one more illustration of the efficacy
measures for combating smallpox if efficien
out, and it supports the view that smallpox,
the major variety, is, of all the epidemic dise
in this country, one of the most amenable t

This does not mean that all the measures
them were of equal value. Some no doubt
in question the value and advisability of
vaccination campaign. We are told that 15,0
were vaccinated in five days, but we are no
total number for the whole of the campaign.
noted that Dr. Boul and Dr. Corfield make
that the mass vaccination campaign played an
part in bringing the outbreak so satisfactorily
and in this I think they are wise. Results
times been claimed for mass vaccination camp
there was no real evidence to justify the clai
debatable point whether a mass vaccination
involving the vaccination of many thousands
with all the suffering from "bad arms"—not
more serious results—which such a measure
entails, is ever really called for until it is cer
other and less drastic measures have failed. In
to the injury to health there is all the public
upset which such campaigns inevitably engen
would matter less if there was any guarantee t
vaccination campaign would cut short an
but even with the most energetic campaign
always be plenty of people left unprotected t
the outbreak.

In the outbreak of smallpox in the ne
county of Middlesex, reported in the *Britis*
Journal for August 10, 1946, equally satisfact
were obtained without any recourse to mass
of the general population.

Other points in the article by Dr. Boul
Corfield calling for comment are:

1. Of the 4 fatal cases, 2 were vaccinated
had four marks; so even "efficient" vaccin
guarantee against death from smallpox if to
interval has elapsed. In one of the cases t
was only 27 years. Of the 2 fatal cases w
unvaccinated one (R. Pe.), a contact, might ha
death had he not foolishly refused vaccinati
days, when it proved to be too late. It is to
that when compulsory vaccination is repeale
to vaccination, which compulsory vaccination
edly engenders, will gradually disappear, an
close contacts will then refuse vaccination.
good reason to believe that vaccination d
incubation period, if performed early eno
mitigate an attack even if it fails to complete

2. One of the cases (Mr. Rd.) was the sanitar
who arranged the disinfection of the houses an
He had been vaccinated but never re-vaccinate
attack unfortunately proved fatal. Another
a nurse at the smallpox hospital who had a
attack. All members of a public-health staff
have to fight smallpox—doctors, nurses, sanita
tors, &c.—should of course be protected by
vaccinations as a matter of routine.

3. I agree with most of their "Conclusions
I am a little doubtful about no. 3, which deal
question of "marks." I am inclined to think t
of interval since the last vaccination is of more i
than the number of marks. I would rather ma
and often" my slogan. I admit of course t
case of the general public frequent vaccinatio
impracticable, but then I regard immunisat
general population as not the way to protect a c
against smallpox. The case of a public-he
however, is quite different, and they should be
every few years. Indeed, it might not be a b
make it an annual event for the whole staff,
the medical officer of health. After the first v
there would be practically no reaction, so no inco
would be caused.

Leicester. C. KILLICK M

specialised profundities. If he really collaborated and his name appeared at the head of an article, it would not matter because he could be attacked by fellow experts. Dr. Harrison's paper is typical of hundreds others. His experimental work is excellent. The ithmetic of his statistical adviser is beyond reproach. ıt there is no logical cohesion between the two. He d his adviser have unwittingly misled each other. either is to blame. The fault lies in our cultural legacy science split up into water-tight compartments. What true of statistics is equally true of radiology, histology, inical laboratory reports, &c. I want to plead for ore whole-hearted collaboration. Experts must not se touch with general medicine, and general medicine ust learn from experts.

Royal Society of Medicine. DENYS JENNINGS.

SPLANCHNIC BLOCK FOR ANURIA

SIR,—Your leading article of August 17 on the recent ork of Trueta and his colleagues [1] refers to the need r further trial of splanchnic block in anuria. The teresting and attractive explanation of oliguria made ssible by their observations lends belief to the probable enefit from splanchnic block. Nevertheless, caution is eeded in interpreting a diuresis which may follow this ethod of treatment.

In the last two years, we have had 4 cases of severe iguria after abortion, all treated conservatively without ypertonic solutions, splanchnic block, or decapsulation, nd all had a spontaneous diuresis and recovered. etailed biochemical studies were made, and are being eported elsewhere. If splanchnic block had been done owards the climax of their desperate illness, doubtless would have been given the credit for their recovery.

CASE 1.—Single, aged 31. Abortion at 16th week, followed y 10 days oliguria with secretion of only 262 c.cm. urine. lood-urea rose to 550 mg. per 100 c.cm. Excellent diuresis ıen occurred, and complete recovery. Well two years later.

CASE 2.—Single, aged 37. Abortion at 16th week, followed by 4 days severe oliguria with a total secretion of 2360 c.cm. urine. lood-urea rose to 350 mg. per 100 c.cm. Good diuresis then egan and blood-urea returned to normal. Well 22 months later.

CASE 3.—Married, aged 24. Two children. Incomplete eptic abortion at 16th week. Oliguria persisted for 13 days, nd during this time she passed only 1350 c.cm. urine. Like he previous cases, she was extremely ill with vomiting and iccough, and she became œdematous. Blood-urea rose to 00 mg. and the serum potassium to 42·5 mg. per 100 c.cm. he heart became completely irregular and the electrocardioram showed very large T-waves and absent P-waves. Sponaneous diuresis then occurred, and, although colpotomy as necessary for pelvic abscess, she made a satisfactory ecovery, and was well three months later.

CASE 4.—Single, aged 31. Admitted on account of bloodtained vomitus, but found to have an incomplete abortion. he had been losing for a week. The next five days a modertely severe oliguria was noted. Blood-urea rose to 365 mg. er 100 c.cm. A diuresis then began, and her blood chemistry eturned to normal within two weeks. She was quite well 8 months later.

As far as could be determined, these cases were not ue to incompatible blood-transfusion, sulphonamide herapy, or abortifacients. They may have begun as a eflex vascular spasm with cortical ischæmia, and ssibly progressed to thrombosis and cortical necrosis.

In the obstetrical wards there has also been one fatal ase of anuria from cortical necrosis of the kidneys in girl of 16 admitted at term with severe accidental oncealed hæmorrhage. She was delivered of a stillborn hild and developed anuria and died on the third day. splanchnic block with amethocaine hydrochloride was iven on the second day, and repeated on the third day, ut without any effect.

About 1500 deliveries and 400 abortions are admitted nnually at this hospital. In view of our experience it surprising that only 19 cases of acute renal failure ter abortion, and only a total of 52 associated with regnancy, have so far been published.[2]

M. A. M. BIGBY.
F. AVERY JONES.
J. MACVINE.

Central Middlesex County Hospital,
London, N.W.10.

Trueta, J., Barclay, A. E., Daniel, P., Franklin, K. J., Pritchard, M. M. L. *Lancet*, August 17, p. 237.

O'Sullivan, J. V., Spitzer, W. *J. Obstet. Gynæc.* 1946, 53, 158.

Obituary

ARTHUR TUDOR EDWARDS

M.A., M.D., M.CHIR. CAMB., F.R.C.S.

Mr. A. Tudor Edwards, who died suddenly at St. Enodoc's, Cornwall, on August 25, won a world reputation by his advancement of thoracic surgery.

Coster

Born in 1890, Arthur Tudor Edwards was educated at Mill Hill School, at Cambridge University, and at the Middlesex Hospital where he was awarded the senior Broderip and university scholarships. From the first it was clear that his bent was surgery. At the Middlesex he worked under the late Sir John Bland-Sutton and Mr. (now Sir) Gordon Gordon-Taylor; the surgery of mangled limbs he learned from the mechanical genius of Meurice Sinclair; and he gained a wide experience of traumatic and general surgery during the first world war, in which he served as a major with a casualty clearing station. After demobilisation he acquired an aptitude for treating the aftermath of operations on the gastro-intestinal tract that must have been the envy of his colleagues. The years of waiting were ended by his appointment to the Westminster Hospital and the Brompton Hospital. His way was not easy; the attitude to thoracic surgery was at that time one of cautious, and indeed justified, reserve which was to be overcome only by proof that major procedures could be undertaken with safety. In his successes with the surgical treatment of bronchiectasis, bronchial and œsophageal carcinoma, and pulmonary tuberculosis, Tudor Edwards provided that proof; and to the Brompton he attracted visitors of all nations, eager to learn his methods.

His reputation was established through his pioneer work in developing techniques which helped to advance thoracic surgery from the occasional reluctant, and always precarious, intervention to the status of an acknowledged specialty ranking with abdominal and other accepted branches of surgery. But he had further claims to recognition: he was a great operator and a teacher of distinction. Those that saw the easy grace of his technique in the difficult procedures that had previously defeated others realised that he was in the front rank of great operators; his associates were perhaps most impressed by the courage and foresight with which he embarked on difficult cases, and by his sound clinical judgment. Really great success in major surgery comes not to the lone worker but to the man who can organise and inspire his colleagues, assistants, and nurses to form one harmonious unit, and in this again he set a great example.

"My first meeting with Tudor Edwards," writes G. M., "was in the early nineteen-twenties, when I sought his help on behalf of a patient with bronchial carcinoma. That first contact made an impression which is still clear; for even at that time he showed the characteristics which were to make him a leader and a pattern for the younger men in his specialty, both in this country and abroad. His manner was grave and courteous, he paid careful attention to my notes of history and clinical findings, to the reports of bronchoscopist and pathologist—and then he crosschecked them all! Essential data must be verified if he did not know and trust those who had recorded them. We were not offended, for it was clear that his one object was the safety of the patient, and this he ensured by every resource he could command. Nothing second-rate would do. He was an outstanding organiser of team-work. Surgeon, physician, radiologist, pathologist, anæsthetist, physiotherapist, nursing staff, surgical assistant—all knew what was expected of them and gave of their best. The patient also was made fully aware of the nature of the

APPEAL FOR MEDICAL AND NURSING JOURNALS

SIR,—Reports and requests from UNRRA missions in Europe make it abundantly clear that the greatest expressed need of doctors in the liberated countries is for medical literature covering the war years, so that they may bring themselves up to date with advances in unoccupied countries.

From time to time appeals for medical literature for individual countries have appeared in the medical press, and the British Council, the Ministry of Information, the Royal Society of Medicine with its microfilm scheme, and other bodies have done something to cope with the problem, but, as a whole, the needs of Europe have hardly begun to be met.

Even if UNRRA could spend its now scanty funds on medical re-education—which it is authorised to do only in the limited sense of informing doctors how to use drugs and other medical supplies supplied by UNRRA with which they may be unfamiliar—a special difficulty arises in the case of British medical and nursing literature on account of the paper shortage.

I am, therefore, appealing for complete sets of general and specialist medical and nursing journals covering approximately the war years. They should be sent to Dr. H. Hadaway, *Room 1934, Health Division, UNRRA*, 19, Portland Place, London, W.1 (Telephone: Langham 3090/341), and carriage will be repaid if requested. If it is felt that the sets cannot be given free of charge, a price should be stated before the sets are forwarded to us and we will try to obtain authority for their purchase. A particular request which we have so far been unable to meet is for a complete set of THE LANCET (1939 to 1945 inclusive) for Hungary.

London, W.1. NEVILLE M. GOODMAN.

PHYSIOLOGY OF CONVALESCENCE

SIR,—I am sure your leading article of August 10 was not meant to imply that convalescence is merely a matter of protein administration. Nevertheless this may be an opportune moment to draw attention to other factors influencing convalescence—namely, the patient's personality and emotional state, and his relationship with his doctor.

Every surgeon is at times confronted by the case where "things will go wrong" despite irreproachable technique before, during, and after operation. In patients who seem to be of equally good physical type the course of convalescence after the same operation may differ enormously. I suspect that it does not entirely depend on postoperative feeding, and I wonder how much attention was paid to emotional factors in the experiments you describe. A surgeon with an indifferent technique (there are some such about) may present some surprisingly good end-results. I am led to believe that personality as well as protein, character as well as calories, play their part. Convalescence being a process of psychic healing as well as tissue healing, it is worthy of study by the psychiatrist as well as the biochemist.

Convalescence on the whole is better conducted by the family doctor, who is more likely to understand the mental make-up and requirements of his patient. Even the specialist surgeon who attaches as much importance to pre- and post-operative care as he does to operative technique (no longer a rara avis) is as likely as any other—perhaps indeed more likely—to disregard his patient's personality. Moreover not all surgeons are equally suitable for all patients; and just as, with free selection, a patient gets the practitioner he deserves, he should also have the surgeon whose personality best fits his own. The family doctor's choice of surgeon is or should be influenced by the surgeon's personality as well as his ability with a scalpel.

To a patient HIS operation is a major event in his life —a milestone if not a tombstone, a turning-point, ominous and fraught with danger. It may come as a climax to a series of mounting fears, or as a devastating bolt from the blue; in any case the trauma is psychic as well as physical. Even after the operation, fears for the future may remain; often a modification or radical change in his life is necessary. These considerations need skilled help, and his convalescence will be influenced accordingly.

Certain operations, moreover, have a special significance to the patient. The loss of the uterus or a breast in the female, prostatectomy or removal of a testicle in the male are examples of mutilating operations, with particular effects on the psyche. In considering cancer, the patient's fear necessitates regard for personality as well as postoperative prognosis. Psychic preparation, suggestion, reassurance, and explanation are as necessary as the choice of pre-anæsthetic or the Fowler position. Here the psychiatrist may well be able to show the influence of personality and reaction-type as well as of neuroses and anxiety patterns in determining success.

Is it too much to hope that the nurse should help more constructively in these problems? At present, and through no fault of her own, her conversation consists of useless if not harmful platitudes, interspersed with blood-curdling reminiscences. Were she brought more into the picture as an intelligent assistant to the tea her constant presence might be used to the mental well as physical benefit of the patient.

Convalescence depends in its final analysis upon t total personality of the individual, and upon his ment and physical make-up, and their reactions to traum These should not be neglected in any study of convalescent problems.

London, W.1. S. CHARLES LEWSEN.

DESOXYCORTONE AND ARTHRITIS

SIR,—Dr. Harrison will always be in trouble with hi statistics until he cultivates the habit of defining hi symbols carefully. His recent calculation (*Lancet* August 10) differs from mine not because either of us i incapable of arithmetic but because the P which he calculates represents among other things the probability of a number of dead rats not developing arthritis. Such a probability is naturally much higher than my estimate based on the behaviour of live rats.

My prolusion was purposely vague to spare Dr. Harrison's feelings. But now he tells us that he has the support of a member of the Institute of Statistical Analysis at Oxford. I trust for the good name of Oxford statistics that I may assume that this adviser never read the paper of Selye (1944) on which the arguments are based. Serious discussion is difficult, because the logic is almost entirely that of Lewis Carroll rather than of Dodgson. This mysterious P, the meaning of which i always changing, is calculated to two places of decimals suggesting accuracy; but it is a matter of arithmetica convenience how it is calculated and the answer depend on the method. This is the sort of thing which Alice found so trying and which made her head go round.

The use made of P is just as startling as the methods of calculating it. Statistics do not prove a hypothesis directly; but if good experimental design reduces possible alternative explanations to two or three, statistical methods may show that all except one are improbable. Dr. Harrison has to choose between Selye's hypothesis that adrenalectomy and thyroidectomy facilitate the production of desoxycortone arthritis and his own hypothesis that their effect is negligible. There is no question of Selye's hypothesis being improbable. It is Dr. Harrison's which is on the borderline of being eliminated. P stands for the maximum probability of Dr. Harrison being right, and his argument can fairly be summarised by saying that he considers that he has afforded statistical proof of his rightness if he can show that the odds against himself are less than 20 : 1; whereas Selye is wrong unless the odds are 20 : 1 in favour. No doubt we shall hear from Dr. Harrison that this is "perfectly valid statistical procedure" and an orthodox application of the nul hypothesis, or another of those numerous phrases with which specialties exert their tyranny. If so, Selye is truly in an unfortunate position. He never attempted to justify his statement statistically but relied on quantitative as well as qualitative differences and on control series represented by a succession of papers in previous years. He also gave a number of subsidiary arguments which led up to his experiments. All these points are unrepresented in the contingency tables which are said to summarise his evidence. In addition, the number of controls in the contingency tables is so small that it is virtually impossible for Dr. Harrison's requirements to be fulfilled.

I must apologise to Dr. Harrison for the Pickwickian vigour of this onslaught. The point at issue is quite important. In medicine, we are always being bullied by the expert behind the scenes who threatens us with ecialised profundities. If he really collaborated and is name appeared at the head of an article, it would ot matter because he could be attacked by fellow xperts. Dr. Harrison's paper is typical of hundreds f others. His experimental work is excellent. The rithmetic of his statistical adviser is beyond reproach. ut there is no logical cohesion between the two. He nd his adviser have unwittingly misled each other. either is to blame. The fault lies in our cultural legacy f science split up into water-tight compartments. What true of statistics is equally true of radiology. histology, linical laboratory reports, &c. I want to plead for ore whole-hearted collaboration. Experts must not se touch with general medicine, and general medicine st learn from experts.

oyal Society of Medicine. DENYS JENNINGS.

SPLANCHNIC BLOCK FOR ANURIA

SIR,—Your leading article of August 17 on the recent rk of Trueta and his colleagues [1] refers to the need further trial of splanchnic block in anuria. The eresting and attractive explanation of oliguria made ssible by their observations lends belief to the probable nefit from splanchnic block. Nevertheless. caution is eded in interpreting a diuresis which may follow this thod of treatment.

In the last two years, we have had 4 cases of severe guria after abortion, all treated conservatively without pertonic solutions, splanchnic block, or decapsulation, d all had a spontaneous diuresis and recovered. tailed biochemical studies were made, and are being ported elsewhere. If splanchnic block had been done wards the climax of their desperate illness, doubtless would have been given the credit for their recovery.

ASE 1.—Single. aged 31. Abortion at 16th week, followed 10 days oliguria with secretion of only 262 c.cm. urine. od-urea rose to 550 mg. per 100 c.cm. Excellent diuresis en occurred, and complete recovery. Well two years later.

CASE 2.—Single. aged 37. Abortion at 16th week, followed by days severe oliguria with a total secretion of 2360 c.cm. urine. ood-urea rose to 350 mg. per 100 c.cm. Good diuresis then gan and blood-urea returned to normal. Well 22 months later.

CASE 3.—Married, aged 24. Two children. Incomplete ptic abortion at 16th week. Oliguria persisted for 13 days, d during this time she passed only 1350 c.cm. urine. Like e previous cases, she was extremely ill with vomiting and ccough, and she became œdematous. Blood-urea rose to 0 mg. and the serum potassium to 42·5 mg. per 100 c.cm. e heart became completely irregular and the electrocardio- am showed very large T-waves and absent P-waves. Spon- neous diuresis then occurred, and, although colpotomy as necessary for pelvic abscess, she made a satisfactory covery, and was well three months later.

CASE 4.—Single, aged 31. Admitted on account of blood- ained vomitus, but found to have an incomplete abortion. e had been losing for a week. The next five days a moder- ely severe oliguria was noted. Blood-urea rose to 365 mg. r 100 c.cm. A diuresis then began, and her blood chemistry turned to normal within two weeks. She was quite well months later.

As far as could be determined, these cases were not e to incompatible blood-transfusion, sulphonamide erapy, or abortifacients. They may have begun as a flex vascular spasm with cortical ischæmia. and sibly progressed to thrombosis and cortical necrosis.

In the obstetrical wards there has also been one fatal se of anuria from cortical necrosis of the kidneys in girl of 16 admitted at term with severe accidental ncealed hæmorrhage. She was delivered of a stillborn ild and developed anuria and died on the third day. splanchnic block with amethocaine hydrochloride was ven on the second day, and repeated on the third day, t without any effect.

About 1500 deliveries and 400 abortions are admitted nually at this hospital. In view of our experience it surprising that only 19 cases of acute renal failure ter abortion, and only a total of 52 associated with egnancy, have so far been published.[2]

M. A. M. BIGBY.
entral Middlesex County Hospital, London, N.W.10. F. AVERY JONES.
J. MACVINE.

Trueta, J., Barclay, A. E., Daniel, P., Franklin. K. J., Pritchard, M. M. L. *Lancet*, August 17, p. 237.

O'Sullivan, J. V., Spitzer, W. *J. Obstet. Gynæc.* 1946, 53, 158.

Obituary

ARTHUR TUDOR EDWARDS

M.A., M.D., M.CHIR. CAMB., F.R.C.S.

Mr. A. Tudor Edwards, who died suddenly at St. Enodoc's, Cornwall, on August 25, won a world reputation by his advancement of thoracic surgery.

Born in 1890, Arthur Tudor Edwards was educated at Mill Hill School, at Cambridge University. and at the Middlesex Hospital where he was awarded the senior Broderip and university scholarships. From the first it was clear that his bent was surgery. At the Middlesex he worked under the late Sir John Bland-Sutton and Mr. (now Sir) Gordon Gordon-Taylor; the surgery of mangled limbs he learned from the mechanical genius of Meurice Sinclair: and he gained a wide experience of traumatic and general surgery during the first world war, in which he served as a major with a casualty clearing station. After demobilisation he acquired an aptitude for treating the aftermath of operations on the gastro-intestinal tract that must have been the envy of his colleagues. The years of waiting were ended by his appointment to the Westminster Hospital and the Brompton Hospital. His way was not easy; the attitude to thoracic surgery was at that time one of cautious, and indeed justified, reserve which was to be overcome only by proof that major procedures could be undertaken with safety. In his successes with the surgical treatment of bronchiectasis, bronchial and œsophageal carcinoma, and pulmonary tuberculosis, Tudor Edwards provided that proof: and to the Brompton he attracted visitors of all nations, eager to learn his methods.

Coster

His reputation was established through his pioneer work in developing techniques which helped to advance thoracic surgery from the occasional reluctant. and always precarious. intervention to the status of an acknowledged specialty ranking with abdominal and other accepted branches of surgery. But he had further claims to recognition: he was a great operator and a teacher of distinction. Those that saw the easy grace of his technique in the difficult procedures that had previously defeated others realised that he was in the front rank of great operators; his associates were perhaps most impressed by the courage and foresight with which he embarked on difficult cases. and by his sound clinical judgment. Really great success in major surgery comes not to the lone worker but to the man who can organise and inspire his colleagues, assistants, and nurses to form one harmonious unit, and in this again he set a great example.

"My first meeting with Tudor Edwards," writes G. M., "was in the early nineteen-twenties. when I sought his help on behalf of a patient with bronchial carcinoma. That first contact made an impression which is still clear; for even at that time he showed the characteristics which were to make him a leader and a pattern for the younger men in his specialty. both in this country and abroad. His manner was grave and courteous, he paid careful attention to my notes of history and clinical findings, to the reports of bronchoscopist and pathologist—and then he crosschecked them all! Essential data must be verified if he did not know and trust those who had recorded them. We were not offended, for it was clear that his one object was the safety of the patient, and this he ensured by every resource he could command. Nothing second-rate would do. He was an outstanding organiser of team-work. Surgeon, physician, radiologist, pathologist, anæsthetist, physiotherapist, nursing staff, surgical assistant—all knew what was expected of them and gave of their best. The patient also was made fully aware of the nature of the

APPEAL FOR MEDICAL AND NURSING JOURNALS

SIR,—Reports and requests from UNRRA missions in Europe make it abundantly clear that the greatest expressed need of doctors in the liberated countries is for medical literature covering the war years, so that they may bring themselves up to date with advances in unoccupied countries.

From time to time appeals for medical literature for individual countries have appeared in the medical press, and the British Council, the Ministry of Information, the Royal Society of Medicine with its microfilm scheme, and other bodies have done something to cope with the problem, but, as a whole, the needs of Europe have hardly begun to be met.

Even if UNRRA could spend its now scanty funds on medical re-education—which it is authorised to do only in the limited sense of informing doctors how to use drugs and other medical supplies supplied by UNRRA with which they may be unfamiliar—a special difficulty arises in the case of British medical and nursing literature on account of the paper shortage.

I am, therefore, appealing for complete sets of general and specialist medical and nursing journals covering approximately the war years. They should be sent to Dr. H. Hadaway, Room 1934, Health Division, UNRRA, 19, Portland Place, London, W.1 (Telephone: Langham 3090/341), and carriage will be repaid if requested. If it is felt that the sets cannot be given free of charge, a price should be stated before the sets are forwarded to us and we will try to obtain authority for their purchase. A particular request which we have so far been unable to meet is for a complete set of THE LANCET (1939 to 1945 inclusive) for Hungary.

London, W.1. NEVILLE M. GOODMAN.

PHYSIOLOGY OF CONVALESCENCE

SIR,—I am sure your leading article of August 10 was not meant to imply that convalescence is merely a matter of protein administration. Nevertheless this may be an opportune moment to draw attention to other factors influencing convalescence—namely, the patient's personality and emotional state, and his relationship with his doctor.

Every surgeon is at times confronted by the case where "things will go wrong" despite irreproachable technique before, during, and after operation. In patients who seem to be of equally good physical type the course of convalescence after the same operation may differ enormously. I suspect that it does not entirely depend on postoperative feeding, and I wonder how much attention was paid to emotional factors in the experiments you describe. A surgeon with an indifferent technique (there are some such about) may present some surprisingly good end-results. I am led to believe that personality as well as protein, character as well as calories, play their part. Convalescence being a process of psychic healing as well as tissue healing, it is worthy of study by the psychiatrist as well as the biochemist.

Convalescence on the whole is better conducted by the family doctor, who is more likely to understand the mental make-up and requirements of his patient. Even the specialist surgeon who attaches as much importance to pre- and post-operative care as he does to operative technique (no longer a rara avis) is as likely as any other—perhaps indeed more likely—to disregard his patient's personality. Moreover not all surgeons are equally suitable for all patients; and just as, with free selection, a patient gets the practitioner he deserves, he should also have the surgeon whose personality best fits his own. The family doctor's choice of surgeon is or should be influenced by the surgeon's personality as well as his ability with a scalpel.

To a patient HIS operation is a major event in his life —a milestone if not a tombstone, a turning-point, ominous and fraught with danger. It may come as a climax to a series of mounting fears, or as a devastating bolt from the blue; in any case the trauma is psychic as well as physical. Even after the operation, fears for the future may remain; often a modification or radical change in his life is necessary. These considerations need skilled help, and his convalescence will be influenced accordingly.

Certain operations, moreover, have a special significance to the patient. The loss of the uterus or a breast in the female, prostatectomy or removal of a testicle in the male are examples of mutilating operations, particular effects on the psyche. In considering the patient's fear necessitates regard for personality well as postoperative prognosis. Psychic preparation suggestion, reassurance, and explanation are as neces as the choice of pre-anæsthetic or the Fowler Here the psychiatrist may well be able to show th influence of personality and reaction-type as well as neuroses and anxiety patterns in determining success.

Is it too much to hope that the nurse should help constructively in these *problems?* At present, through no fault of her own, her conversation cons of useless if not harmful platitudes, interspersed *blood-curdling reminiscences.* Were she brought into the picture as an intelligent assistant to the her constant presence might be used to the mental well as physical benefit of the patient.

Convalescence depends in its final analysis upon th total personality of the individual, and upon his me and physical make-up, and their reactions to traum These should not be neglected in any study of conval-cent problems.

London, W.1. S. CHARLES LEWSEN

DESOXYCORTONE AND ARTHRITIS

SIR,—Dr. Harrison will always be in trouble with statistics until he cultivates the habit of defining hi symbols carefully. His recent calculation (La August 10) differs from mine not because either of us is incapable of arithmetic but because the P which he calculates represents among other things the probability of a number of dead rats not developing arthritis. Such a probability is naturally much higher than my estimate based on the behaviour of live rats.

My prolusion was purposely vague to spare Dr. Harrison's *feelings. But now he tells us that he* has the support of a member of the Institute of Statistical Analysis at Oxford. I trust for the good name of Oxford *statistics that I may assume that this adviser* never read the paper of Selye (1944) on which the arguments are based. Serious discussion is difficult, because the logic is almost entirely that of Lewis Carroll rather than of Dodgson. This mysterious P, the meaning of which i always changing, is calculated to two places of decimals suggesting accuracy; but it is a matter of convenience how it is calculated and the answer depend on the method. This is the sort of thing which Al found so trying and which made her head go round.

The use made of P is just as startling as the method of calculating it. Statistics do *not* prove a hypothe directly; but if good experimental design reduc possible alternative explanations to two or three, statistical *methods may show that all except one* are improbable. Dr. Harrison has to choose between Selye's hypothesis that adrenalectomy and thyroidectomy facilitate the production of desoxycortone arthritis and his own hypothesis that their effect is negligible. There is no question of Selye's hypothesis being improbable. It is Dr. Harrison's which is on the borderline of be eliminated. P stands for the maximum probability of Dr. Harrison being right, and his argument can fairly be summarised by saying that he considers that he has afforded statistical proof of his rightness if he can s that the odds against himself are less than 20 : 1; whereas Selye is wrong unless the odds are 20 : 1 in favour. N doubt we shall hear from Dr. Harrison that this is "perfectly valid statistical procedure" and an orthod application of the nul hypothesis, or another of the numerous phrases with which specialties exert their tyranny. If so, Selye is truly in an unfortunate position. He never attempted to justify his statement statistically but relied on quantitative as well as qualitative differences and on control series represented by a succession of papers in previous years. He also gave a number of subsidiary arguments which led up to his experiments. All these points are *unrepresented in the* contingency tables which are said to summarise his evidence. In addition, the number of controls in the contingency tables is so small that it is *virtually impossible* for Dr. Harrison's requirements to be fulfilled.

I must apologise to Dr. Harrison for the Pickwickian vigour of this onslaught. *The point at issue* is quite important. In medicine, we are always being bulli by the expert behind the scenes who threatens us with rhaps May's many gifts," writes D. C. N., "were 'ed to the best advantage during the international ss on Life Assurance Medicine in 1938, when he as chairman of the organising committee. His live contacts with colleagues abroad and his rity with their languages and special work and ts, were invaluable in selecting speakers and ing the programme. His quiet humour and failing courtesy went far to ensure the smooth ıg of committees under his chairmanship. He ; had a smile and a kindly word for the younger rying to find their feet in this rather perplexing n's-land between the worlds of scientific medicine shrewd business, and he combined most happily isdom and caution of long experience of the effects rbid conditions on life expectation with an alert st in modern methods of research and treatment."

his work for the British Social Hygiene Council rummond Shiels writes: "In the first world war, ent his full energies to Mrs. Neville Rolfe and to rganisation she founded (afterwards the British Hygiene Council) in the fight against the taboos prejudices—inside and outside the profession— hindered effective measures for the prevention reatment of the venereal diseases. Thereafter, in gs and in speech, and often with little official rt, he continued his work for the council in the years between the two wars, and at his death he chairman of its executive committee. He also red substantial service to the Central Council for h Education, when that body assumed responsibility .D. propaganda. He lived not only to see the eal diseases take their appropriate place among al problems, but also to be cheered by new and ising treatments. He had a very happy family nd was always prepared to fight against forces or tions which prevented happy family life for others. ıg the late war he returned to duty from his retire- and led a team in long and strenuous days of al examination of recruits for the Services. In his but effective way he did something for public health or human happiness which his friends will remember pride and gratitude."

. May married Miss G. Mabel Rose and they had ions.

Births, Marriages, and Deaths

BIRTHS

IAW.—On Aug. 29, in Liverpool, the wife of Mr. H. Bernard agahaw, F.R.C.S.E.—twin daughter and son.

—On Aug. 26, at Oldham, Dr. Margaret Binks (née Jackson), ie wife of Dr. Paul Binks—a son.

N.—On Aug. 21, the wife of Dr. John Brown, of Bedlington— son.

KLIN.—On Sept. 1, at Edgware, the wife of Dr. C. B. Franklin —a son.

IAN.—On Aug. 26, in London, the wife of Dr. J. Esmond Iurman, R.A.F.V.R.—a son.

ONALD.—On Aug. 29, at Stanwix, Carlisle, the wife of Dr. Ian Iacdonald—a son.

AINE.—On Aug. 26, at Retford, the wife of Wing-Commander . V. Maclaine, M.B., R.A.F.—a son.

UGHLIN.—On July 19, in Dublin, the wife of Lieut.-Colonel . E. McLaughlin, I.M.S.—a daughter.

RSON.—On Aug. 30, at Whitchurch, Shropshire, Dr. Evelyn togerson, wife of Dr. Gerard Rogerson—a daughter

NBERG.—On Aug. 24, at Worthing, the wife of Dr. Henry tosenberg—a daughter.

AMORE.—On Aug. 26, at Macclesfield, the wife of Flight-Lieutenant T. O. Scudamore, M.B.—a son.

Y.—On Aug. 25, in London, the wife of Dr. Rupert Solley— son.

E.—On Aug. 28, the wife of Dr. Douglas Teare, of Midhurst— son.

ER.—On Aug. 30, at Kingston, the wife of Dr. G. D. Walker —a son.

H.—On Aug. 29, at Milton, Suffolk, the wife of Dr. Rodney Valsh—a daughter.

G.—On Aug. 24, at Nottingham, the wife of Dr. J. Horton oung—a daughter.

MARRIAGES

LE—BRYANT.—On Aug. 28, at Henbury, Bristol, Edward Vilson Carlile, B.D., to Elizabeth Bryant, M.B.

ER—COX.—On Aug. 22, at Watford, Keith E. Cooper, M.B., o Eileen Mary Cox.

Y—BELDAM.—On Aug. 24, in London, Roger Anderson rownsword Drury, B.M., to Gillian Beldam.

N—WEDDELL.—On Aug. 29, at Colchester, François Edward Iortimer Puxon to Margaret Weddell, M.R.C.O.G.

DEATHS

ELL.—On Aug. 26, at Ambleside, Thomas Houghton Mitchell, .D. Durh., aged 83.

Notes and News

THE DENTIST'S INCOME

THE Minister of Health and the Secretary of State for Scotland have appointed a committee of nine members, including four dentists, under the chairmanship of Sir Will Spens, to recommend "what ought to be the range of total professional income of a registered dental practitioner in any publicly organised service of general dental practice." The Minister has further written to Sir Will Spens stressing that the terms of reference do not bind the committee to base their recommendations on what dentists have earned in the past, but make it clear that the committee should state what in their view the remuneration of dentists should be if the proper social and economic status of general dental practice is to be maintained in the future, and if the profession is to attract suitable recruits.

TREATMENT OF RECURRENT HERPES

RECURRENT herpes is seldom a serious disease, but it causes discomfort and disfigurement for days at a time and as such may be a lifelong burden. The treatment consists in finding a satisfactory local application. Dr. Arthur Whitfield writes: "The application of a drying powder, which is the usual treatment, has, I think, very little effect; and ointment simply increases the sensation of heat and often leads to suppuration. Attacks are generally preceded by premonitory sensations of burning and itching. I found that tar solutions applied at this stage help to abort the attack; and, after several experiments, I settled finally on a water-soluble varnish, 'Pellanthum,' to which is added 10% of liquor picis carbonis, made up by Messrs. Handford and Dawson, Harrogate. This can be carried about and easily smeared over the affected area, the resulting film being almost invisible. There is no evidence that the treatment removes the tendency to relapse, but it does at least ease the lot of those that suffer from this tiresome disease."

University of Cambridge

Dr. M. Hynes has been appointed reader in medicine, from Oct. 1 next. Dr. C. L. G. Pratt has been appointed university lecturer in mammalian physiology, and Dr. G. P. McCullagh, university lecturer in pathology. Mr. A. L. Hodgkin, M.A., has been appointed temporary university lecturer in physiology, and Dr. H. Butler temporary university demonstrator in anatomy.

University of London

As already announced, the title of professor of clinical pathology in the university has been conferred on Dr. R. J. V. Pulvertaft, in respect of the post held by him at Westminster Hospital medical school.

Dr. Pulvertaft is 49. After leaving Westminster School he served from 1915 to 1919 in the Royal Sussex Regiment, being seconded to the Royal Flying Corps and R.A.F. as observer (Palestine) and pilot (B.E.F.). At the end of the war he went up to Trinity College, Cambridge, where he had won a scholarship in classics, and after taking the second part of the natural sciences tripos, in physiology, he went to St. Thomas's Hospital as a university scholar. Having qualified in 1923 he became assistant bacteriologist in the venereal diseases department and was pathologist to the medical and surgical units from 1923 to 1932, holding a Plimmer research fellowship for part of this time. In 1932 he was appointed director of the J. B. Carlill laboratories at Westminster Hospital, and reader in pathology in the University of London. He became M.R.C.P. in 1927, M.D. in 1933, and F.R.C.P. in 1938. During the late war he served in the Army, chiefly in Egypt and Palestine, and was for a time assistant director of pathology, Middle East Forces. In 1944 he was appointed O.B.E. His original observations have been largely concerned with the behaviour of streptococcal and other infections; before the war he made a special study of aerosol disinfection, and of late he has worked on penicillin. He was for several years editor of *Discovery*.

As already announced, the title of professor of physiology has been conferred on Mr. W. R. Spurrell, F.R.C.S., in respect of the post now held by him at Guy's Hospital medical school.

Mr. Spurrell graduated B.SC. Lond., with first-class honours in physiology, in 1931. He studied medicine at Guy's Hospital, qualifying M.R.C.S. in 1924, and M.B. Lond., with gold medal and distinction in surgery and pathology, in 1925. The following year he graduated M.S., and passed his final examination for the F.R.C.S. At Guy's Hospital he held appointments as outpatients officer, house-surgeon, demonstrator in anatomy and physiology, and surgical registrar; he was also awarded the Parsons research fellowship. Subsequently, in the University of Leeds, he was research assistant in the department of experimental pathology from 1928 to 1930, and was demonstrator in physiology before taking up his present appointment at Guy's Hospital. He is the author of numerous articles, and has taken a special interest in the physiology of the alimentary tract.

operation planned, of its risks, and of any disabilities it would entail. His full coöperation was obtained in a carefully planned course of preoperative and post-operative treatment. Tudor Edwards, or "Tudor" to his friends, could act with the utmost decision and despatch; but action was quiet and seemingly unhurried. His manner in the operating theatre was typical of the man—decisive, but gentle and considerate. I never heard him speak impatiently or unkindly to those who were assisting him."

His published work gives some idea of his vast experience in the last twenty-five years. Thus his last important paper, in the first number of *Thorax*, contains an analysis of over a thousand cases of bronchial carcinoma, in 70% of which he had performed either pneumonectomy or lobectomy. He was the first surgeon in this country to perform with success lobectomy by dissection; and he had already had many successes with tourniquet lobectomy before its general introduction in 1931. He was the first surgeon in this country to perform a pneumonectomy; and he was among the first—if not actually the first—to report successful resection of the carcinomatous œsophagus. He is also known for his fundamental contributions to the treatment of empyema.

In 1936 the London Hospital invited him to organise a department of thoracic surgery, and he resigned from the Westminster Hospital to concentrate on his specialty. As consultant thoracic surgeon to the L.C.C. he was responsible for founding the successful unit at St. Mary Abbot's Hospital. He was also surgeon to King Edward VII Sanatorium, Midhurst, and was attached to Queen Alexandra's Hospital, Millbank. The strain of these many activities, along with that of a busy consultant practice, inevitably took its toll. In 1938 he had a severe illness, but made a good recovery. In the autumn of 1939, however, he again fell ill. Even this did not deter him from once more throwing all his energies into work during the second war. He was obliged to limit his operating, but, as consultant adviser to the Ministry of Health, took an active part in the founding of centres for the reception of thoracic casualties throughout Great Britain; these have proved so valuable that it is difficult to see how they can be dissolved. As civilian consultant to the R.A.F. he founded a special centre; he was also consultant thoracic surgeon to the War Office, and served on many committees. In 1939 he was awarded the honorary degree of M.D. by Grenoble University, and in 1943 was appointed to the council of the Royal College of Surgeons. He was a past president of the Association of Thoracic Surgeons, and was recently elected first president of the Association for the Study of Diseases of the Chest, which owes its origin largely to his inspiration and enthusiasm. Only this year the degree of M.D. was conferred on him, honoris causa, by the University of Oslo, which, during his last illness, sent him a gold ring. He is survived by his widow.

G. G.-T. writes: "Those who have been reckoned great in surgery must of necessity be supremely skilled in the craftsmanship of our profession; they must by the initiation of some novel and successful system of treatment or by the operative invasion of territories hitherto unconquered have conferred untold blessing on mankind; their work must have illumined the dark, mysterious chasms in our knowledge of disease; but they must also have trained and inspired a band of surgical acolytes. Tudor fulfilled these criteria right well; his operating theatre became a Mecca not only for thoracic surgeons but for general surgeons from all over the world." "Sincerity and directness of purpose," adds a colleague, "were unmistakable in his character, and one feels that he would ask no greater memorial than the realisation of how much the chest surgery of today owes to his efforts."

Surgeon Commander W. T. GWYNNE-JONES, R.N., was one of the five occupants, all of whom lost their lives, when a Royal Naval Air Ambulance crashed on Mickeldore Crags, near Scafell, while carrying a patient from Abbotsinch naval air station to Warrington. Commander Gwynne-Jones, who was 54 years of age, qualified at the London Hospital in 1915.

HARRIE LESLIE HUGO SCHÜTZE

M.B. MELB., M.D. WÜRZBURG

Dr. Harrie Schütze, who died at Berne, in Switz
on August 9, was born in Melbourne in 1882, th
of a German father and an English mother. Edu
at Brackley and Cumloden, he graduated M.B. a
University of Melbourne in 1905. Continuing his m
education he took his M.D. at Würzburg two years
and became assistant in the Institute of Hygiene in
city. In 1912 he was elected to a Beit fellowship a
the following year he was appointed to the staff o
Lister Institute of Preventive Medicine in the ba
logical department, where he remained througho
professional life. For many years towards the e
his service Schütze was in charge of the vaccine de
ment of the Institute, a position for which his n
bent, training, and experience well fitted him.

One of his colleagues writes: "A competent ba
logist and a careful, thorough, and conscientious in
gator, he was so critical of his own work th
results, though obtained in somewhat specialised f
stand today as he left them. His early work, larg
an orientating character, stressed the importance
reality of the different members of the salmonella
of organisms and brought order into a field which
becoming confused. Later he showed the importa
of the envelope of the plague bacillus in the antigenic
of the vaccines made from it, and he also demonstrat
the essential differences between those otherwise clos
related micro-organisms, *Pasteurella pestis* and *P*
pseudotuberculosis.

"In 1913 Schütze married Henrietta Leslie, the nove
and playwright. They shared common interests
art, music, literature, and travel, and, apart from
war when they lived at Radlett, they entertained
friends, in a style and manner not soon to be forgot
in their charming house in Chelsea. Of a quiet, stu
and retiring disposition, with a pleasant subdued
and a cultured, courteous manner, Schütze's fa
often moved him more deeply than appeared o
surface; his concern for the persecuted and dispos
scholars of Europe was real, as were his efforts to re
their distress."

OTTO MAY

M.A., M.D. CAMB., F.R.C.P.

Dr. Otto May, chairman of the British Social Hy
Council, died on August 15. As a former principal me
officer of the Prudential Assurance Company he
an established position in the insurance world, but
brilliant academic career was unknown even to man
his friends, while his modesty and concern with a
time unpopular medico-sociological problems obs
his professional ability and attractive personality.
in 1879, the second son of the late William May,
was educated privately. Entering St. John's Co
Cambridge, with a foundation scholarship he too
first in both parts of the natural sciences tripos
after holding a demonstratorship in physiolog
Cambridge completed his medical education at Univ
College Hospital. He qualified in 1907 and was aw
the Atchison scholarship and the Liston medal.
spending a year in house-appointments at U.C.H.,
became in 1908 medical registrar at the Midd
Hospital, and the following year physician to outpat
at the Evelina Hospital for Children. To this p
while he held a B.M.A. research scholarship and a
fellowship, belong his papers on sensory disturba
of heart disease, the mechanism of cardiac pain,
posterior root section for the treatment of spasticit

When he joined the Prudential Assurance Compan
1912 he thus brought to his new work a backgrou
clinical experience and scientific training which qu
won recognition. He served the Assurance Med
Society as secretary for many years, and in 1920 in
presidential address, assessing the progress of
assurance medicine, he urged doctors to provide
actuaries with data on which to base more accu
assessments of mortality. Dr. May also discussed in
columns tuberculosis in relation to life assurance
the value of periodical medical examinations. He
an honorary member of the Association of Life Assur
Medical Directors of America.

PAINFUL FEET

PRISONERS-OF-WAR IN THE FAR EAST

REVIEW OF 500 CASES

E. K. CRUICKSHANK
M.B. Aberd.
ı the Department of Medicine, University of Aberdeen

symptom known as "painful feet," "burning "aching feet," "sore feet," and "happy feet" ppeared among prisoners-of-war in Changi Camp, ore, at the end of July, 1942—i.e., five and a half s after their capture. Some of the Malayan doctors t in the camp were already familiar with it, and r and Pallister (1935) had described it in inmates local jails who were on a diet deficient in vitamin B ad noted that the pain disappeared when green bles were added to the diet.

following account is based on the records of 500 personally observed.

SYMPTOMS

ı of two types was felt in the feet :

A dull ache was usually the earliest abnormality as felt below the heads of the metatarsals and in the of the toes. At first it was present only at night a long day's standing or walking, developing as atient was trying to sleep. As the days passed, he became more pronounced, coming on in the early ng and increasing when the patient retired to bed. as variously described as aching, burning, or bing.

Sharp stabbing pains became superimposed on the in 58·6% of the 500 cases. A single pain lasted sec., shooting, parallel to the toes and soles of the nto the heels, through the ankle-joints, and some- up the shins to the knees. In 6·4% there were r symptoms in the hands, but these usually developed in long-standing cases 4–8 weeks after the onset nptoms in the feet.

the condition progressed, the ache or burning sensa- ecame constant, being present all day, getting worse evening, when the shooting pains began to appear. pains reached their maximum when the patients to bed, and often prevented sleep, at first for 1–2 , but later, in the severe cases, throughout the Exercise relieved the pain considerably for a so many patients got up and walked around most e night. Some put their feet in cold water or ged them, whereas others preferred warmth. ese measures, however, gave very temporary relief ; as time passed, the patients became worn out, red and irritable from loss of sleep and constant pain. this stage, usually several weeks after the onset, ppetite rapidly became poor in many of the men, hese often showed pronounced lassitude and loss ight.

rly 80% of the patients gave a previous history of iciency state of the vitamin-B_2 type—stomatitis, tis, scrotitis, or defective vision.

SIGNS

eral.—In the early case the general condition was unless there had been some recent debilitating e, such as severe dysentery or chronic malaria, on precursors of the syndrome. In the established ic case there was evidence of rapid loss of weight. ace had a strained worried look, with dark shadows the eyes, the result of constant pain and lack of Some patients were nervous and jumpy, particu- t any prospect of having their feet examined.

incidence of associated deficiency conditions in 0 cases reviewed when they came under observa- as as follows.

)

Vitamin-B_2 deficiency	
Scrotitis	30·0%
Stomatitis (angular stomatitis, glossitis, lesions of buccal mucosa, palatal erythema)	31·6%
Defective vision (the result of retrobulbar neuropathy)	13·0%
Vitamin-B_1 deficiency (8·0%)	
Œdema	6·2%
Neuritic signs :	
Absent or sluggish reflexes	2·2%
Hypalgesia of legs	1·8%
No associated deficiency disease	42·0%

Diarrhœa was not an associated condition in the cases reviewed, though 36% had a history of one or two attacks of dysentery. Most of the patients were outpatients, only severe cases being admitted to hospital. Cases occurring in hospital patients with some other disease, such as chronic dysentery or malaria, are excluded.

Feet and Legs.—No abnormality of the feet and legs was seen in the great majority of cases. Some feet were red, some pale, some somewhat bluish ; but, when the feet of 50 patients with painful feet were compared with those of 50 persons without painful feet, an equal variety of hue was found in the skins of the controls. There was no evidence in the skin of vascular spasm or of trophic changes. Most of the feet were warm, and the dorsalis pedis and posterior tibial arteries were easily palpable. The capillary circulation appeared normal, in that an area blanched by pressure rapidly recovered its colour on release of the pressure. Some patients had deformities of the feet—various degrees of flat-foot and hallux valgus—but the proportion was no higher than in a group of controls. In a few of the severe cases the feet sweated excessively, and, if they were dried, visible beads of sweat again appeared in a few minutes. Some patients in hospital adopted a characteristic attitude in bed. They sat forwards in a half-squatting position, gripping their toes in their hands. They were extremely nervous of having their feet examined and withdrew the foot rapidly if they were lightly touched. Hypersensitivity to pinprick and light touch was present in about 22·2%, but in most of these, if the feet were firmly gripped and handled, there was no complaint of pain. Cramps and muscle spasm were rare, and there was no muscular tenderness.

Nervous System.—Tendon reflexes were exaggerated in 23%, and in most of these cases the reflexes were affected in the arms as well as legs, even when there were no pains in the hands. In these patients the slightest tap with a reflex hammer produced a very brisk response ; in some cases 3–10 clonic movements of the ankles (and, in a few, of the patella) were elicited when clonus was tested for. The abdominal reflexes were present in all cases and usually brisk. The plantar responses were usually flexor, but in some cases an equivocal response was repeatedly found; the feet in those cases were extremely sensitive, and pronounced withdrawal was associated with such responses. The exaggerated reflexes developed gradually in the course of the disease, becoming apparent on an average 3–6 weeks from the onset of symptoms, though some cases showed this feature at the first examination. Of the 51 cases which showed hypertension (discussed below) 39 had exaggerated reflexes, and 12 had reflexes within normal limits—i.e., 76% of all cases with hypertension, as compared with 23% of the whole series, showed increased reflexes.

The gait in severe cases was slow and hobbling because of the pain but showed considerable individual variation. In 2·2% the tendon reflexes were absent or very sluggish, and in 1·8% hypalgesia of the feet and legs was found ; these were regarded as cases of associated vitamin-B_1 deficiency. No other sensory changes were present.

Cardiovascular System.—In 9 cases there was tachycardia (pulse-rate 90 or more per min. after the patient

Society of Apothecaries of London

At a court of assistants held on August 20 with Dr. H. F. Powell, the master, in the chair, Dr. C. T. Parsons was elected master for the ensuing year, and Dr. J. P. Hedley and Prof. E. C. Dodds, F.R.S., wardens. Professor Dodds was appointed representative at the British-Swiss Medical Congress at Bâle, and Sir Cecil Wakeley on the governing body of the British Postgraduate Medical School and the proposed British Postgraduate Medical Federation.

It was unanimously resolved to award the society's gold medal in therapeutics for 1946 to Sir Alexander Fleming, F.R.S., and Sir Howard Florey, F.R.S., in recognition of their discovery of penicillin.

The following were admitted to the freedom of the society:

By Redemption: Richard Clitherow, M.P.; B. J. Frankenberg; Lord Amulree; A. J. Rook; C. W. F. McKean.
By Servitude: G. M. Woodwark.

The following were appointed examiners: pathology, R. W. Scarff; midwifery (deputy examiner), Anthony Charles; chemistry, Phyllis Sanderson. The following diplomas were granted:

D.I.H.—A. Anderson; K. Biden-Steele; M. P. Fitzsimons; O. G. Bennett; G. F. Keatinge.

L.M.S.S.A.—F. W. Flight; D. Rivers; C. M. M. Severn; P. R. Needham; I. T. Holloway; A. Macarthur; F. Deutscher; D. A. Bailey; H. Walker; G. Steinberg; R. Cartledge; W. F. Belsham; *J. M. Jones; C. C. Gibbons*; R. N. H. *Vann*; R. M. *Michelmore*; R. M. Jenkins; E. J. Rich; A. Culiner; J. L. Struan-Marshall; K. R. W. Miller.

London Hospital

From Oct. 16 to 19 a postgraduate course for former students will be held at the hospital. Those who wish to attend should notify the dean as soon as possible. The annual dinner will take place on Thursday the 17th, at 7.30 P.M., at Claridge's Hotel, Brook Street, London, W.1, when Sir Henry Bashford will be in the chair.

International Conference in London

An international medical conference is to be held at B.M.A. House, Tavistock Square, from Sept. 25 to 27, to consider the promotion of closer ties among the national medical organisations in the different countries. The conference is being convened by the British Medical Association in conjunction with the Association Professionnelle Internationale des Médecins. The languages will be English and French, and an interpreter will be present.

Aslib Conference

Sir Reginald Stradling, F.R.S., president elect of the association, will open the 1946 conference at the Polytechnic, 309, Regent Street, London, W.1, on Saturday, Sept. 14, at 10.30 A.M. Further information may be had from ASLIB office, 52, Bloomsbury Street, W.C.1.

Royal Sanitary Institute

The institute will hold their 1947 Health Congress at Torquay, from June 2 to 6, under the presidency of Earl Fortescue.

London Scientific Film Society

During the coming session, beginning this month, the society will show scientific and documentary films on Sunday afternoons and evenings; it also hopes to arrange for lectures and the showing of research films on weekdays. Among other proposed activities are the organisation of scientific films for children, the publication of a quarterly journal, and the production of experimental films. Inquiries should be directed to the society at 34, Soho Square, London, W.1.

Merseyside Telephone Bureau

Doctors who have no-one at home to answer their telephones have set up a central bureau in Rodney Street, Liverpool, where urgent messages can be left. They will keep in touch with the bureau while on their rounds and receive any messages which have been sent during their absence. The *Daily Express* (August 27) states that the new service, which is staffed mainly by former medical orderlies and telephonists from the Forces, will cost each doctor £20 a year.

17th London British General Hospital

A reunion dinner of this hospital will be held at Oddenino's Restaurant, Piccadilly, London, W.1, on Oct. 25, 1946. Tickets can be obtained from Dr. C. H. Atkinson, 53 Park Street, W.1; Dr. D. Blatchley, 2 Chatsworth Road, W.4; Dr. S. P. Rea, 84 Banstead Road, Carshalton, Surrey.

Return to Practice

The Central Medical War Committee announces t
following have resumed civilian practice:

Mr. A. SEYMOUR PHILPS, F.R.C.S., 104, Harley Street,
Mr. A. H. M. SIDDONS, M.CH., F.R.C.S., 140, Harley S
(As from Sept. 29.)

THIOUREA DERIVATIVES IN THYROTOXICOSIS.
Genatosan Ltd. point out that the American series c
thyrotoxicosis, quoted in our annotation of August 10
showing an incidence of agranulocytosis of 0·5%, w
with thiouracil and not methyl thiouracil. Thoug
thiouracil has been submitted to clinical trial in Grea
Denmark, and Switzerland, there appear to be no
reports of agranulocytosis with this drug. Acc
Astwood and Vanderlaan (*J. clin. Endocrin.* 194
propyl thiouracil is even more satisfactory than th
and ethyl homologues, and it is now undergoing c
in this country.

Major D. C. BOWIE, O.B.E., F.R.C.S.E., R.A.M.C.,
mentioned in despatches in recognition of gallant a
guished services in the defence of Hong-Kong in 194

Appointments

CAMPBELL, HARRY, M.B. St. And., D.P.H.: deputy M.O.H. an
school M.O., Bath.
FISHER, R. E. W., M.B. Belf., D.P.H.: chief M.O., S
Gas Co., S.E.15.
FOX, P. J., M.B. N.U.I., D.P.H.: temp. asst. school M.O., Co
GOULD, Surgeon-Lieut. D. W., M.R.C.S.: M.O., Hong-Kong
HYDE, W. D., M.B. Edin.: M.O.H., Enfield.
MORTON, WILLIAM, M.D. Glasg.: superintendent, N
Hospital.

Gloucestershire Royal Infirmary and Eye Institution:
BIRKS, P. M., M.B. Adelaide, F.R.C.S.E.: surgeon and
surgeon.
EVANS, C. F., F.R.C.S., D.L.O.: asst. surgeon to E.N.T. d
HAMILTON, H. A., M.B. Camb., M.R.C.O.G.: gynæcologic
HUGHES, T. H., M.R.C.S., D.A.: anæsthetist.
HYDE, E. W., M.B. Camb., D.M.R.: radiologist.
JARRETT, R. F., M.B. Camb., M.R.C.P.: physician.
TOM, ARTHUR, M.R.C.S., D.A.: anæsthetist.
WILKIN, W. J., M.B. Camb., F.R.C.S.: surgeon and rad

Kent and Sussex Hospital:
ASHBY, P. T., M.B. Camb., D.A.: anæsthetist.
EASTON, J. H., M.D. Camb., M.R.C.P.: physician.
JACOBY, N. M., M.D. Lond., M.R.C.P.: pædiatrician.
SYMONS, H. M., M.B. Melb., D.O.M.S.: asst. ophthalmic

Royal Sheffield Infirmary and Hospital:
DORNAN, ALFORD, M.B. Belf., F.R.C.S.: orthopædic sur
GRAY, J. D., M.B. Sheff., F.R.C.S.: surgeon, E.N.T. (
Nov. 26).
HATHERLEY, EDITH, M.B. Sheff., D.O.M.S.: ophthalmic
JORDAN, ARTHUR, M.B. Lond., M.R.C.P.: biochemist.
LODGE, THOMAS, M.B. Sheff., F.F.R.: radiologist.
SNEDDON, I. B., M.B. Sheff., M.R.C.P.: dermatologist.
STUART-HARRIS, C. H., M.D. Lond., F.R.C.P.: physician
WAYNE, E. J., M.D. Leeds, F.R.C.P.: physician.

Medical Diary

SEPT. 8 TO 14

Monday, 9th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W
3.45 P.M. Prof. R. A. Willis: Invasive Spread of Tum
5 P.M. Dr. Michael Kremer: Cerebrospinal Fluid.

LONDON SCHOOL OF HYGIENE, Keppel Street, W.C.1
4 P.M. Dr. Earl Carlson: Cerebral Palsy in Children.

Tuesday, 10th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Metastasis.
5 P.M. Dr. John McMichael: Circulatory Failure.

Wednesday, 11th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Metastatic Growths
Primary Ones.
5 P.M. Dr. John McMichael: Circulatory Failure.

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Prof. W. J.
Irregular Dominance in Hereditary Nystagmus.

Thursday, 12th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Spontaneous Tumours
5 P.M. Dr. R. G. Macfarlane: Hæmostasis.

EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (Royal Infirmary.) Dr. I. G. W. Hill:
cardiogram in Coronary Disease.

Friday, 13th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Experimental Pro
Tumours.
5 P.M. Dr. R. G. Macfarlane: Hæmostasis.

gering and exaggeration of symptoms were difficult clude. Only by careful observation and certain could these be detected, and there is no doubt ome patients made the most of their symptoms to camp fatigues and heavy work.

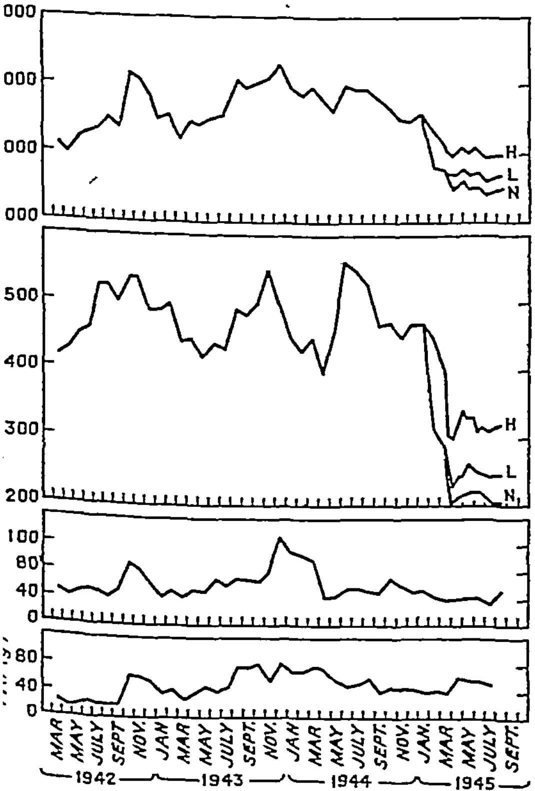
en Gram.—In 20 chronic cases 8 oz. of boiled green was given daily for various periods. These cases all relatively severe and of long standing, and were n because a considerable amount of weight had been The results were as follows:

In 11 cases there was considerable improvement in an ge of nineteen days. Of these, 2 had had five nicamide ions of 1·7 c.cm. intravenously before the green gram, slight improvement in 1 and none in the other. One r patient, owing to his severe symptoms, was given a of five nicamide injections while receiving green gram, ith no improvement.

In 7 cases there was some improvement in an average nty-nine days. Of these, 1 improved considerably when ide was given, and 2 showed no improvement with ide.

In 2 cases there was no improvement in an average of -five days. Of these, 1 had had nicamide before the gram, with no improvement. The other was given ide after thirty-one days on green gram and was con-bly improved.

ce Polishings.—In 323 cases 3 oz. of rice polishings given daily. This dose was chosen because it was average maximum amount that could be taken patient in a day. In many cases a larger dose uced diarrhœa and abdominal discomfort. It was easant material to take; and, since most of the nts received their dosage as outpatients, it was ult to make sure that the full daily dose was taken; patients were actually caught trying to dispose of it. must be taken into consideration in assessing results. the 323 cases treated with rice polishings none was letely relieved; 128 (39·6%) showed considerable ovement after an average of six weeks' treatment, the time varying from two to twelve weeks; 51 (15·8%) showed some improvement in the same average period; 144 (44·6%) were not improved or worse. In the first two groups a few patients relapsed while still on rice polishings.



1—Calories, carbohydrates, proteins, and fat in daily ration: , heavy-duty ration; L, light-duty ration; N, no-duty ration.

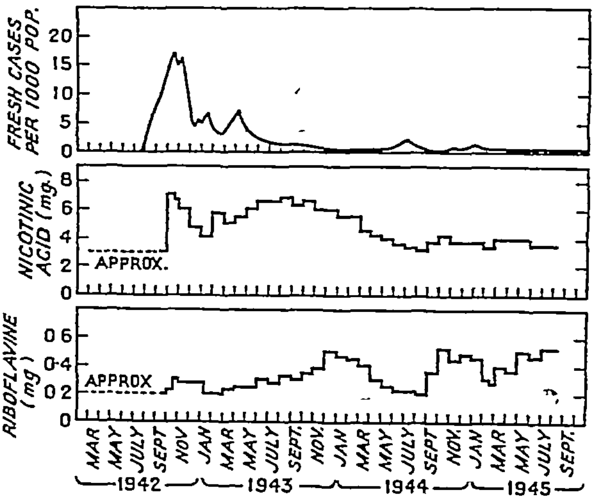


Fig. 2—Incidence of fresh cases of painful feet per 1000 of population compared with amounts of nicotinic acid and riboflavine per 1000 calories of diet.

Marmite.—To 38 patients 1 oz. of marmite was given daily by mouth. None was completely relieved; 21 (55·3%) showed considerable improvement in three weeks; 5 (13·2%) were considerably improved after an average of twenty-six days; and 12 (31·5%) were not improved after two weeks' treatment.

The results of treatment are summarised in the accompanying table.

CONTROLS AND FOLLOW-UP

Unfortunately no true control group was kept in which no treatment whatever was given, because the condition was considered to be a vitamin-deficiency syndrome from the first, and it was not regarded as justifiable to withhold treatment. However, cases occurred outside our camp in isolated areas where no specific source of extra vitamin B was available; in these no considerable improvement took place until better rations were supplied, when the symptoms gradually became less severe and eventually disappeared.

It was impossible to follow up the cases indefinitely, and a considerable number of the patients who had not much improved left for other camps while under observation. The incidence graph (fig. 2) shows that there was a sharp fall in the number of fresh cases at the end of November, 1942, when Red-Cross supplies became available, and thereafter there was a considerable general improvement in the diet as the camp personnel began to receive pay from the Japanese. It became possible to supplement considerably the basic Japanese ration with locally purchased foods, such as green gram and groundnuts. With this improvement in the diet the cases which had not responded to specific treatment gradually improved, and by July, 1943, the syndrome had almost disappeared from the camp. Nor did a wave of fresh cases occur thereafter.

However, 6 patients seen three years after the onset said that their feet had not quite returned to normal. They complained of occasional aches in the feet at night, with stabbing pains at times. The symptoms were often worse in cold or wet weather.

The abnormal briskness of tendon reflexes, where present, gradually became less as the pain disappeared, but there was usually a lag of one or two months in those cases where the disappearance of pain was rapid.

RESULTS OF TREATMENT OF 500 CASES OF PAINFUL FEET WITH VITAMIN-B SUPPLEMENTS

No. of cases	Treatment	Approx. content of—			Results of treatment								Remarks
		Vitamin B_1 (µg.)	Riboflavine (mg.)	Nicotinic acid (mg.)	Complete relief		Much improved		Improved		No change or worse		
					No. of cases	Average time	No. of cases	Average time	No. of cases	Average time	No. of cases	Average time	
119	Nicamide 2 c.cm. 5–8 daily i.v. injections	..	..	340	20	During or within a few days of injection	62	During or within a few days of injection	19	During or within a few days of injection	18	..	Mostly given rice 2 oz. daily injections within 1-2
20	Boiled green gram 8 oz. daily	750–1000	3·3	2	..	..	11	19 days	7	29 days	2	35 days	All severe long hospital
323	Rice polishings 3 oz. daily by mouth	2500	0·25–0·5	20–40	..	..	128	6 weeks	51	6 weeks	144	6 weeks	Mostly
38	Marmite 1 oz. daily by mouth	233	1·63	33	..	..	21	3 weeks	5	26 days	12	2 weeks	Mostly outpat

had been lying down for half an hour). Of these, 1 had associated hypertension alone, 3 had hypertension with exaggerated reflexes, 2 had hypertension with absent reflexes, and 3 normal blood-pressures and normal reflexes. None of the cases showed evidence of organic heart disease.

Of 189 cases in which the blood-pressure was recorded, 51 gave readings that were considered hypertensive.* (The upper limit of normality was arbitrarily placed at 130/90 mm. Hg; the average reading for 500 subjects without sore feet over the same period was 121/78.) The average age of the patients with hypertension was 28 years (oldest 42, youngest 21). The average blood-pressure in the hypertensive cases was 142/104 mm. Hg (highest 200/142). The average reading for the other 138 cases in which blood-pressure was recorded was 118/76 mm. Hg.

In all the cases with hypertension the symptoms were severe and of long standing. In this group the feet had been painful for 1–5 months (average 2½ months); the average loss of weight, during 6–18 months' imprisonment, was 3½ st. (maximum 7 st. 4 lb., minimum 9 lb.); in all cases sleeplessness had lasted more than a month, in some for as long as three months; and in 49 out of the 51 the appetite had been poor for a month.

In 11 of the 51 patients hypertension developed under observation. In the rest it was present when the first blood-pressure reading was taken; these were usually men who had been held on the lines as long as possible and referred to hospital only when they became unfit for duty.

No albumin was found in the urine of any of these cases.

TREATMENT

When the pains in the feet first appeared they were assumed to be a result of a deficiency of vitamin-B complex, in view of the findings of Landor and Pallister (1935).

General.—All the patients were rested as far as possible. Those with milder symptoms were taken off duties which involved standing or walking. Those with more severe symptoms were admitted to hospital and kept in bed, except for bathing and going to the latrines. This was very difficult to enforce, because of the temporary relief obtained from exercise, and the men often slipped out of bed and were found walking round and round the buildings.

Diet.—The patients received the ordinary camp diet, the calculated calorie value and food content of which are shown in fig. 1. Available extra sources of vitamin-B complex were as follows.

Rice polishings.
Green gram (*Phaseolus radiatus*)—one of the pulse
Extract of green leaves.
Ground-nuts (available in small quantities only).
Soya bean (available only after the major wave passed).
'Marmite.'
'Nicamide' (B.W. CO.) (nikethamide, the diethylamide nicotinic acid); 2 c.cm. is equivalent to 340 mg. nicotinic acid.
Synthetic crystalline vitamin B_1 (in small quantities

RESULTS

Crystalline Vitamin B_1.—In 6 cases 2 mg. was daily intravenously for seven days, but no improvement resulted. Owing to very limited supplies and the occurrence of frank beriberi in the camp no cases of painful feet were treated by this method.

Nicamide.—In preliminary experiments with it was found that no improvement resulted from stration by mouth. Intramuscular injection improvement, but intravenous injection produced most rapid and satisfactory results. A daily 1·7 c.cm. was given intravenously for 5–10 consecutive days in 110 cases. These were divided into two groups

(1) In 98 chronic cases (symptoms present month or more) results were as follows:

(*a*) 10 patients obtained complete relief, except sional aches, for two months. The symptoms disappeared, usually after the fourth or fifth injection response did not occur immediately on injection. has no immediate peripheral vasodilator effect nicotinic acid.

(*b*) 54 patients showed considerable improvement were able to sleep, and the sharp shooting pains occasional or disappeared. Of these cases 12 relapsed a week of completing the injections in spite of 2 oz. polishings daily. (In groups (*a*) and (*b*), when pos patients were given 2 oz. of rice polishings daily for months after the injections.) Of these 12 patients, bad as ever, and 7 were partially relieved.

(*c*) 16 patients showed some improvement. The pains became less frequent, and they could get some night.

(*d*) 18 patients showed no improvement.

(2) In 21 acute cases (treatment instituted three weeks of onset) results were as follows:

(*a*) 10 patients obtained complete relief except for aches, but 3 of them relapsed ten, seventeen, and days after the last injection.

(*b*) 8 patients showed considerable improvement.

(*c*) 3 patients were slightly improved.

To 10 patients, used as controls, 2 c.cm. of water was given intravenously daily for five said there was slight improvement.

Since the severity of the condition had to be to a considerable extent by the patient's statem

---

* Blood-pressure was not recorded in the earlier cases, when the possible association with hypertension had not yet been recognised.

OLIC ACID IN THE TREATMENT OF MEGALOBLASTIC ANÆMIA

L. S. P. Davidson
A.Camb., M.D.Edin., F.R.C.P., F.R.C.P.E., F.R.S.E.
PROFESSOR OF MEDICINE

R. H. Girdwood
M.B. Edin., F.R.C.P.E., M.R.C.P.

rom the Department of Medicine, University of Edinburgh

MUCH attention has been aroused by recent reports Spies (1946) and others on the use of *folic acid* in galoblastic anæmias of various types: the work has n summarised in recent articles in this journal (*Lancet* 46a and b).

By courtesy of Dr. Spies and Messrs. Lederle Laboraies Inc. we have received a small quantity of synthetic ic acid, and have treated nine patients suffering from galoblastic anæmia. For this initial investigation we se six cases of classical addisonian pernicious anæmia, h typical megaloblastic bone-marrow and histamine-t achlorhydria, but with no neurological signs and preceding history of diarrhœa or dietary deficiency. ese six patients were given folic acid in varying amounts mouth or by injection. The object of this part of the estigation was to confirm the hæmopoietic activity of ic acid, as recorded by Spies (1946), and to assess sage. The other three cases were examples of refractory galoblastic anæmia of the type described by Davis d Davidson (1944) which failed to respond to parenteral er therapy but responded to proteolysed liver given mouth.

During the present investigation, our patients received normal ward diet, but no liver was included in the meals. similar diet has been given by us to many cases of rnicious anæmia, and of refractory megaloblastic æmia, without producing any change in the blood cture. In all cases, a control period of at least a fortght was instituted before the commencement of folic id therapy to ensure that spontaneous remission was ot taking place.

ADDISONIAN PERNICIOUS ANÆMIA

CASE 1.—A man, aged 72, with typical addisonian pernicious æmia, under treatment for 4 years. He had responded tisfactorily to 'Anahæmin,' but some months before lmission his doctor had stopped treatment with parenteral er on account of general and local reactions. At the comencement of folic acid therapy his hæmatological findings ere Hb 38% (5·2 g. per 100 c.cm.); red cells 1 250,000 per mm.; white cells 4400 per c.mm.; P.C.V. 17·5%; M.C.V. 10·0 c.μ; M.C.H.C. 29·7%; reticulocytes <1%; C.I. 1·5.

The patient was tested with folic acid and anahæmin 01 c.cm. intracutaneously. A marked local reaction occurred the site where the liver was injected, but no reaction curred from the folic acid. Accordingly folic acid 20 mg. as given intramuscularly on the 1st and 2nd day of treatent; no local or general reaction occurred. Folic acid 0 mg. was given by mouth daily from the 3rd to the 20th ay of treatment. Table I shows that there was a very atisfactory rise in reticulocytes, red cells, and hæmoglobin, hich was up to the standards demanded by the United tates Pharmacopœia Anti-anemia Preparations Advisory oard (hereafter referred to as the *U.S.P.* standard). After lic acid treatment was stopped, the red cells and hæmoglobin ontinued to rise for a further 21 days, without additional herapy. Owing to the limited supply of folic acid, treatent with anahæmin was started on the 41st day, after reliminary desensitisation, and by the 81st day the bloodount and blood picture had been restored almost to normal.

CASE 2.—A man, aged 37, with typical addisonian pernicious nemia. He was first treated with liver injections 18 months efore the present investigation and improved greatly as a esult: at that time he was in the Services overseas; he had ad no tropical disease. He was discharged from the Army n account of ill health, and had had no anti-anæmic therapy for 9 months before he was referred to us. At the commencement of folic acid therapy his hæmatological findings were: Hb 52% (7·2 g. per 100 c.cm.); red cells 2,050,000 per c.mm.; white cells 3400 per c.mm.; P.C.V. 22·0%; M.C.V. 107·3 c.μ; M.C.H.C. 32·7%; reticulocytes <1%; C.I. 1·3.

The patient was given folic acid 10 mg. by mouth daily *for 20 days. Table I shows that this resulted in a good hæmato*poietic response which, however, did not reach the *U.S.P.* standard; but by the 28th day the erythrocyte increase was satisfactory on this basis. The red cells continued to increase for a further 23 days after the cessation of folic acid therapy, and no rise occurred during the ensuing 27 days. It is to be noted that although the hæmoglobin was 100%, the colour-index was still above unity.

CASE 3.—A man, aged 52, with typical addisonian pernicious anæmia. He had suffered from weakness and breathlessness for a year, but these symptoms had become much worse during the four months prior to admission to hospital. He had never previously been treated with liver. At the commencement of folic acid therapy his hæmatological findings were Hb 50%; red cells 1,870,000 per c.mm.; P.C.V. 23·5%; M.C.V. 125·7 c.μ; M.C.H.C. 29·4%; reticulocytes <1%; C.I. 1·3. He was given folic acid 10 mg. daily by mouth. From table I it will be seen that this produced an increase of 1,270,000 red cells and 26% Hb in 14 days—which is fully up to the *U.S.P.* standard. Owing to shortage of beds, the patient was treated as an outpatient for the first 7 days, and hence the peak of the reticulocyte rise was not established.

CASE 4.—A man, aged 53, with typical addisonian pernicious anæmia. He had suffered from weakness and breathlessness for 6 weeks before admission. No anti-anæmic therapy had been given before admission to hospital. At the commencement of folic acid therapy his hæmatological findings were: Hb 36% (5·0 g. per 100 c.cm.); red cells 1,270,000 per c.mm.; white cells 3800 per c.mm.; P.C.V. 14·5%; M.C.V. 114·2 c.μ; M.C.H.C. 34·5%; reticulocytes <1%; C.I. 1·4.

The patient was given folic acid 5 mg. daily by mouth for 68 days. Table I shows that he gained 36% Hb and 1,780,000 red cells per c.mm. in 21 days—a rise which conforms to the *U.S.P.* standard. The reticulocyte rise and the rate of regeneration over the first 14 days of treatment were, however, below this standard. By the 57th day of treatment the hæmoglobin had reached 100%, but the colour-index was still above unity, and the M.C.V. was 102·4 c.μ.

CASE 5.—A woman, aged 38, with typical addisonian pernicious anæmia, who had never had liver therapy. She had suffered from weakness and breathlessness for two years, but these symptoms had become much more marked during the two months prior to admission to hospital. Partial thyroidectomy for thyrotoxicosis had been carried out six years previously, with remission of all symptoms and signs other than exophthalmos. At the commencement of folic acid treatment her hæmatological findings were: Hb 28%; red cells 970,000 per c.mm.; white cells 1200 per c.mm.; P.C.V. 11·5%; M.C.V. 118·6 c.μ; M.C.H.C. 33·9%; reticulocytes 2·4%; C.I. 1·44.

She was given folic acid 200 mg. intramuscularly in the first twenty-four hours. Table I shows that this resulted in a sharp rise of reticulocytes and an increase of more than one million red cells and 20% hæmoglobin in 11 days—a result which fully satisfies the *U.S.P.* standard optimal rise. The effect of this initial injection had finished by the 14th day; so a second injection of 100 mg. was given. This resulted in the reticulocytes rising to 16% on the 4th day after injection, and a gain of half a million red cells and 14% hæmoglobin in six days.

CASE 6.—A woman, aged 79, with typical addisonian pernicious anæmia. She complained of increasing weakness and breathlessness for six months. Two years previously she had been treated for pernicious anæmia, but had had no liver by mouth or by injection for the past year. At the commencement of folic acid treatment her hæmatological findings were: Hb 26%; red cells 1,080,000 per c.mm.; white cells 2000 per c.mm.; reticulocytes <1%; C.I. 1·2.

The patient was given a single dose of folic acid 400 mg. by mouth. Table I shows that the response was truly dramatic, particularly in view of the patient's age. The reticulocytes started to increase rapidly on the 3rd day, and reached the high figure of 42% on the 5th day. Fourteen days after the administration of the single large dose of folic

Cases with raised blood-pressure gave normal readings from one to three weeks after considerable improvement or disappearance of the symptoms.

DISCUSSION

The painful-feet syndrome developed among British and Australian prisoners-of-war in Japanese hands six months after they had been on a diet low in vitamin-B complex and first-class protein but adequate in total calories. Fresh cases ceased to appear in any number, and the patients gradually recovered after a few months, when there was an all-round improvement in the diet, with an increase in protein and the vitamin-B complex, particularly vitamin B_1 and nicotinic acid. The syndrome had almost disappeared before there was any increase in the riboflavine intake. The peak incidence of painful feet occurred at a time when fresh cases of recognised vitamin-B_1 deficiency were relatively few and the vitamin-B_1 non-fat-calorie ratio was above the critical level of 0·3 (Williams and Spies 1938).

Crystalline vitamin B_1 given intravenously in a few cases produced no improvement. The intravenous *administration of the diethylamide of nicotinic acid* brought about relief or much improvement in 68·8% of cases in which it was used. This substance has no pharmacological vasodilator effect, as has nicotinic acid. No other pure vitamin of the B complex was available for therapeutic trial. No definite conclusions can be drawn from the results of treatment with marmite, green gram, and rice polishings, as there were no adequate controls; the only controls were 9 patients who received no treatment except two weeks' rest, of whom 2 improved considerably.

The beneficial effects of a diet or of dietary supplements containing adequate amounts of vitamin-B complex point to a B-complex deficiency. The nicamide observations suggest a deficiency of nicotinic acid as an important factor. But, at a later date of imprisonment, when the nicotinic-acid content of the diet again fell to, and remained at a level as low as, that at which the initial outbreak developed, there was no recurrence of these cases in any great number. During this later period, in contrast to the earlier, the riboflavine content of the diet was adequate. A simultaneous deficiency of nicotinic acid and riboflavine may therefore be necessary for the production of the syndrome. The evidence obtainable in the circumstances in which the syndrome was observed does not justify any more definite conclusion.

Pain.—The patients' descriptions of the pain do not throw much light on the mechanism of its production. It differs distinctly from that of causalgia, pink disease, intermittent claudication, erythromelalgia (Brown 1932, Lewis 1936), pseudo-erythromelalgia (Craig and Horton 1938), and asthenia crurum dolorosa (Ekbom 1944). The stabbing pains of the painful-feet syndrome are reminiscent of tabetic lightning pains, but are felt as longitudinal not as transverse stabs, and only below the knees. There is a closer resemblance between the combined aching and stabbing pains of the syndrome and the pain of peripheral neuritis in its earlier irritative stages, but in peripheral neuritis exercise and pressure usually aggravate the pain, and muscular tenderness is present. The closest resemblance is afforded by the immersion-foot syndrome (Ungley et al. 1945), in the hyperæmic stage of which a diffuse severe burning or throbbing pain is felt in feet and legs; about 7–10 days after rescue shooting or stabbing pains are superadded, in bursts like machine-gun fire and radiating from the centre of the foot. They are relieved by cold but aggravated by heat and by exercise; and they are accompanied by circulatory changes and objective neurological signs not seen in the painful-feet syndrome. The excessive sweating seen in some severe cases of painful feet resembles that described in the later stages of immersion foot.

Peripheral nerve damage is demonstrable c and pathologically in immersion foot. The resembl between the pain of painful feet and of immersi and peripheral neuritis suggests that the fo may be produced by some dysfunction of peri nerve-fibres or nerve-endings which does not pr to a stage where clinical evidence of nerve dam found. It seems unlikely that the pain is due to c tory changes in the feet, since it does not resemb pain of known disorders of the blood-vessels, and was no clinical evidence of local vascular dis The mechanism by which the pain is produced is th obscure; a metabolic disturbance of nerve-fibr nerve-endings, due to vitamin deficiency, is the attractive hypothesis.

Exaggerated Reflexes.—The significance of th difficult to assess. They developed in only 23% o cases. Their presence in the arms in many pat whose pain was confined to the feet and legs against any explanation based on hyper afferent nerve-endings. In the great majority of c they were not accompanied by any other sign of pyramidal-tract lesion; the abdominal and cremas reflexes, for example, were active, and the pl responses were flexor except in a few cases where feet were hypersensitive and equivocal responses obtained. It seems likely that the exaggerat of reflexes, which developed mostly in the more cases, may have been an effect of protracted pain and of sleep. On the other hand, when the incidence o feet was at its height, there occurred in the camp cases of frank spastic paraplegia and a few of quadr of obscure ætiology. Some of these began as painful with exaggerated reflexes, and later developed cl signs of upper motor neurone damage. It is possible, fore, that exaggerated reflexes in painful feet sig minimal and reversible degree of damage to the nervous system, due presumably to dietary deficie

Hypertension.—There is no evidence to show w the hypertension observed in 51 out of 180 cases quately examined, is attributable to a specific distur of blood-pressure regulation or is a general effect of long-continued pain and sleeplessness with which it always associated. In all cases except one the b pressure fell with recovery to within normal li In cases where pain was promptly relieved by nic the fall was not abrupt but took place gradually or two weeks. In the single case where hyperten persisted, it was still present after three years and regarded as essential hypertension.

SUMMARY

A syndrome of which the chief features were a and stabbing pains in the feet was observed in pris of-war in Singapore at a time when their diet was de in protein and the vitamin-B complex. Hyperten and exaggerated tendon reflexes were added featur some cases. Observations on 500 patients are record

The diet records, and the beneficial effect of treatm with nikethamide (the diethylamide of *nicotinic* a point to a deficiency of nicotinic acid, perhaps conjunction with riboflavine deficiency, as a factor in the production of the syndrome.

I wish to thank General A. G. Biggam for permissi publish this paper; Dr. R. C. Burgess, who was respo for the diet calculations; and Prof. R. S. Aitken for and criticism in the preparation of the article.

REFERENCES

Brown, G. E. (1932) *Amer. J. med. Sci.* 183, 468.
Craig, W. M., Horton, B. T. (1938) *Surg. Clin. N. Amer.* 18, 8
Ekbom, K. A. (1944) *Acta med. scand.* 118, 197.
Landor, J. V., Pallister, R. A. (1935) *Trans. R. Soc. trop. Med.* 29, 121.
Lewis, T. (1936) Vascular Disorders of the Limbs, London.
Ungley, C. C., Channell, G. D., Richards, R. L. (1945) *Brit. J. S* 33, 17.
Williams, R. R., Spies, T. D. (1938) Vitamin B_1 (Thiamin) and Use in Medicine, London and New York.

rise, an alteration of his bone-marrow from a megalo- tic to a normoblastic state, and a rise in erythrocytes which satisfactory for the first 8 days but thereafter failed to rove with this therapy (table III). Although the stool ridine was negative, the M.C.H.C. was only 26·3% on the h day. Accordingly ferrous sulphate was given for 14 days hout result. The patient was then given proteolysed liver ablespoonful t.i.d. for 14 days. This resulted in an increase ialf a million red cells per c.mm. in 11 days, but thereafter further improvement took place.

ASE 9.—A man, aged 62, had been under treatment for ractory megaloblastic anæmia since 1942. He showed no ponse to anahæmin, but on the recommendation of one of (L. S. P. D.) proteolysed liver was tried in January, 1945. e results of this treatment were satisfactory, the bone-marrow inging from a megaloblastic to a normoblastic state and red cells rising from 1·93 to 3·44 million over a period of days, with a reticulocyte peak of 11·0%. The patient was able to obtain proteolysed liver after May, 1945, and had no rapy other than iron and cod-liver oil up to the time of readmission to hospital in June, 1946. Clinical examina- n revealed that the liver was two finger-breadths enlarged palpation; the spleen was not palpable, and no glandular largement was found. The ankle reflexes could not be cited, the knee-jerks were weak, and there was an tensor plantar response on the right side, the left being ubtful. The patient was underweight; there was no history diarrhœa, no evidence of glossitis, and the dietetic history s satisfactory. A test-meal showed that there was hista- ne-fast achlorhydria. At the beginning of the present estigation the blood figures were: Hb 46% (6·3 g. per 0 c.cm.); red cells 1,700,000 per c.mm.; white cells 6200 r c.mm.; P.C.V. 22·0%; P.C.V. 129·4 c.µ; M.C.H.C. 28·6%; ticulocytes 1%; C.I. 1·4.

This patient was first given 4 c.cm. of anahæmin—twice much as our experience has shown to be adequate to roduce a maximal response in addisonian pernicious anæmia. his resulted in a slight rise in reticulocytes and an unsustained se in red cells. The bone-marrow, however, remained egaloblastic. Folic acid therapy was then begun, and a cond submaximal rise in reticulocytes occurred (table IV). his was followed by a rapid red-cell rise and change in the one-marrow to the normoblastic state. Treatment with folic id for 28 days produced a gain of approximately two illion erythrocytes and 34% hæmoglobin. Continued treat- ent, however, failed to increase the blood-count, and e blood picture remained macrocytic. Treatment with roteolysed liver is now being given.

TABLE III—RESPONSE TO FOLIC ACID THERAPY IN CASE 8

ay of erapy	Hb (%)	Red cells (million/c.mm.)	Reticulocytes (%)	Bone-marrow
1	28	0·95	2·2	Megaloblastic
5	34	1·10	14·0	..
6	..	..	17·4	Normoblastic
7	..	..	18·2 (peak)	..
8	44	1·68	14·4	..
15	44	1·74	1·6	..
20	36	1·75	1·5	..
26	42	2·02	2·4	..
30	40	2·07	<1	..
35	46	2·23	2·0	..
36	46	2·24	2·1	..
41	48	2·66	<1	..
47	50	2·77	<1	..
50	50	2·78	<1	..

Therapy.—20 mg. folic acid by mouth on 1st to 36th days. errous sulphate gr. vi t.i.d. on 21st to 35th days. Proteolysed ver one tablespoonful t.i.d. on 36th to 50th days.

DISCUSSION

This short series includes six cases of addisonian ernicious anæmia, of which four were treated with olic acid daily by mouth in doses ranging from 5 mg. to 0 mg.: two received a single large dose by the parenteral nd oral route respectively. Of the cases receiving daily ral treatment, only case 1, who received 20 mg. daily, ad a reticulocyte response and red-cell rise completely p to the standard demanded by the *U.S.P.* Board. ases 2 and 3, who received 10 mg. daily by mouth, eached the standard at 28 days and 14 days respectively. he reticulocyte rises, however, were suboptimal. With regard to case 4, who received 5 mg. daily, the red-cell rise over 21 days conformed to the *U.S.P.* standard, but the reticulocyte rise was suboptimal. In all six cases the bone-marrow was transformed from a megaloblastic to a normoblastic state. The clinical state of the patients improved coincidentally with the blood.

TABLE IV—RESPONSE TO FOLIC ACID THERAPY IN CASE 9

Day of therapy	Hb (%)	Red cells (million/c.mm.)	Reticulocytes (%)	Bone-marrow
1	46	1·70	<1	Megaloblastic
6	48	1·61	<1	..
7	..	..	4·2	..
8	..	..	5·3 (peak)	..
9	..	..	5·0	..
10	60	2·31	4·1	..
11	..	..	3·3	..
13	..	..	2·2	Megaloblastic
14	58	1·98	1·3	..
16	58	1·99	<1	..
20	..	..	1·3	..
21	..	..	6·0 (peak)	..
23	62	2·06	2·9	..
27	74	2·6	1·6	..
29	..	..	..	Normoblastic
30	80	3·18	<1	..
40	86	3·68	<1	..
45	92	3·85	<1	..
49	94	3·89	<1	..
52	100	3·94	<1	..

Therapy.—1st day 2 c.cm. anahæmin, 2nd day 2 c.cm. anahæmin; 20 mg. folic acid by mouth on 17th to 49th days.

The variations in response of individual cases of pernicious anæmia, with similar blood levels, to parenteral treatment with a standard amount of a potent preparation of liver is recognised by all hæmatologists, and is the principal factor in causing great difficulty in the assessment of potency and dosage. Hence it would be unwise to define the optimal daily dose of folic acid until a much larger series of cases has been treated. Our observations suggest that the therapeutic daily dose by mouth is between 5 mg. and 20 mg. At the time of writing, it would be safer not to reduce the daily dose below 20 mg. in the treatment of pernicious anæmia—an amount found to be satisfactory by Wilkinson et al. (1946).

Attention is drawn to the excellent response which resulted from a single large dose of folic acid given by mouth or parenterally. If results similar to those produced in case 6, who received a single dose of 400 mg. orally, can be obtained regularly, the simplest and most effective method of treatment may prove to be an initial large dose followed at weekly or fortnightly intervals by doses of 50–100 mg.

Most reports have been of treatment with folic acid over relatively short periods, presumably because of the small supply. Published accounts do not clearly indicate that folic acid by itself can regularly restore the blood picture to normal in pernicious anæmia, but we have had private reports from the United States that this has been accomplished. The problem of maintenance therapy has yet to be settled.

With regard to the three cases of refractory megaloblastic anæmia, the following observations appear to be justified.

1. Parenteral injection of a potent purified liver extract was ineffective, while folic acid, in each case, produced a rise in reticulocytes, red cells, and hæmoglobin, and transformed the bone-marrow from the megaloblastic to the normoblastic state. In no instance, however, was folic acid alone able to restore the blood picture to normal.
2. Proteolysed liver by mouth was able to restore the blood picture to normal in case 7, after the red-cell count had ceased to rise with adequate administration of folic acid. In case 8, proteolysed liver also caused a further rise in red cells subsequent to folic acid therapy, but did not restore the blood to normal. Treatment with proteolysed liver has just been begun in case 9.

TABLE I—RESPONSE TO FOLIC ACID IN 6 PATIENTS WITH PERNICIOUS ANÆMIA

Case	Red cells (millions/c.mm.)							Hb % (Haldane)							Reticulocytes (%)			Treatment	
															Initial	At peak	Day of peak	Folic acid (mg. per day)	No. of give
1	*1* 1·25	*7* 1·40	*14* 2·30	*21* 3·31	*42* 3·78	*81* 4·74	..	*1* 38	*7* 42	*14* 56	*21* 72	*42* 80	*81* 96	..	<1·0	40·0	9	20 Also anahæmin on days 41-	[illegible]
2	*1* 2·05	*7* 1·81	*14* 2·09	*20* 2·92	*26* 3·86	*43* 4·27	*70* 4·19	*1* 52	*7* 52	*14* 62	*20* 80	*26* 90	*43* 92	*70* 100	<1·0	10·0	10	10 No treatment on 20–70*	[illegible]
3	*1* 1·87	*5* 1·98	*10* 2·34	*14* 3·14	*25* 3·47	..	..	*1* 50	*5* 51	*10* 66	*14* 76	*25* 84	..	..	<1·0	—	—	10	[illegible]
4	*1* 1·27	*8* 1·25	*15* 1·84	*22* 3·05	*35* 3·45	*57* 4·20	*81* 4·85	*1* 36	*8* 36	*15* 52	*22* 72	*35* 80	*57* 100	*81* 104	<1·0	9·0	8	5	81
5	*1* 0·97	*7* 1·98	*11* 2·13	*14* 2·00	*20* 2·50	..	..	*1* 28	*7* 36	*11* 48	*14* 48	*20* 62	..	..	2·4	24·0	7	200 im. 100 im.	day 1 day 1
6	*1* 1·08	*4* 1·20	*10* 2·04	*14* 3·02	*21* 3·18	..	..	*1* 26	*4* 34	*10* 60	*14* 68	*21* 66	..	..	<1·0	42·0	5	400 by mouth, Single dose	

Italic figures represent day of blood examination. im.=intramuscularly.

* Folic acid 10 mg. was given daily by mouth from the 71st day, and this produced a further rise of red-cell count to 5·05 million o the 91st day.

acid, the red cells had increased by two million per c.mm., and the hæmoglobin by 42%. No further rise occurred by the 18th day, so folic acid 100 mg. was given by mouth on the 21st day. The red-cell increase reported above far exceeds the *U.S.P.* standard.

REFRACTORY MEGALOBLASTIC ANÆMIA

CASE 7.—A woman, aged 37, first admitted to hospital in March, 1944, when she was 5 months pregnant. Her hæmoglobin was then 56% and red cells 2,050,000 per c.mm. The bone-marrow was megaloblastic. A test-meal showed the presence of free hydrochloric acid. A diagnosis of pernicious anæmia of pregnancy was made. She failed entirely to respond to 4 c.cm. of anahæmin given intramuscularly, but responded to proteolysed liver, an increase of red cells of one million per c.mm. occurring in 20 days. The patient was then discharged from hospital, but owing to difficulty in obtaining proteolysed liver she did not continue treatment. She was readmitted in April, 1946, with a history of weakness and of intermittent diarrhœa of a fatty type; a fat-balance test carried out according to the method of Cooke et al. (1946) showed the percentage absorption to be 75%. A test-meal again showed the presence of free hydrochloric acid, and the patient was now thought to be suffering from idiopathic steatorrhœa. She had never been abroad, and the dietetic history was normal. No anti-anæmic treatment had been given for 18 months before the commencement of folic acid therapy as described below. During a control period of 14 days, the reticulocyte count ranged from 2% to 3·5%, but the erythrocyte and hæmoglobin levels remained stationary. At the start of folic acid therapy her blood findings were as follows: Hb 40% (5·5 g. per 100 c.cm.); red cells 1,370,000 per c.mm.; white cells 7800 per c.mm.; P.C.V. 19·0%; M.C.V. 138·7 c.μ; M.C.H.C. 28·9%; reticulocytes 3·5%; C.I. 1·5.

The reticulocyte response and the rise in red cells over a therapeutic period of 14, 21, and 28 days reached the standards demanded by the *U.S.P.* Board, although the patient was suffering from idiopathic steatorrhœa and not from addisonian pernicious anæmia (table II). Despite continued folic acid therapy, 20 mg. daily, no further rise in red cells occurred during the next 20 days. The M.C.H.C. on the 36th day was 27·2%, and, in view of this evidence of iron deficiency, ferrous sulphate was then added to the treatment. Ten days' treatment with iron produced a small rise in the hæmoglobin and no change in the red-cell count. Accordingly, intensive therapy with anahæmin was begun, treatment with folic acid and iron being continued *simultaneously*. Seventeen days after the commencement of parenteral liver therapy the level of hæmoglobin and red cells remained unchanged. Treatment with proteolysed liver was then begun, 1 tablespoonful t.i.d. being given. An increase of one million red cells and 14% hæmoglobin occurred in 13 days, with the restoration of the blood picture to normal.

CASE 8.—A man aged 61. Six weeks before this patient came under our charge he had been diagnosed as having pernicious anæmia, and during the month preceding the commencement of folic acid therapy he had been given 24 c.cm. of anahæmin. There was no response to this therapy; th blood figures continued to fall, and the bone-marrow remain megaloblastic. The patient gave a 2 years' history of weakness and breathlessness. He said that he suffered from hæmor rhoids, which had bled intermittently during the preced 6 years. No loss of blood was evident after admission t hospital, and the stool benzidine test was persistent negative. The dietetic history was normal, and there was diarrhœa. There were no abnormal neurological signs; th liver and spleen were not palpable, and there was no abnor glandular enlargement. There was no history of hæmatem and no visible enlargement of veins on the abdom wall. There was no albuminuria. It is noteworthy that th patient's daughter died in our wards a year ago with a seve refractory megaloblastic anæmia and was found at autops. to have cirrhosis of the liver. In view of this family histor liver-function tests were performed on our patient. Th serum bilirubin was 0·65 mg. per 100 c.cm.; the blood ch terol was 167 mg. per 100 c.cm.; and the cephalin cholest test was negative. Serum alkaline phosphatase was 7 u per 100 ml.; serum albumin 3·06 per 100 c.cm.; ser globulin 2·15 g. per 100 c.cm. The lævulose-tolerance te and hippuric-acid test were both normal. In short neit clinical examination nor laboratory tests demonstrated th presence of hepatic dysfunction. No adequate explanat for the low serum albumin was found. At the commence of folic acid therapy the blood figures were: Hb [illegible] (3·9 g. per 100 c.cm.); red cells 950,000 per c.mm.; whi cells 5200 per c.mm.; P.C.V. 13·0%; M.C.V. 136·8 c.μ; M.C.H.C. 30·0%; reticulocytes 2·2%; C.I. 1·5.

This patient, who showed no response to a very large dose of anahæmin, responded to folic acid therapy with a retic

TABLE II—RESPONSE TO FOLIC ACID THERAPY IN CASE

Day of therapy	Hb (%)	Red cells (million/c.mm.)	Reticulocytes (%)	Bone-marro
1	40	1·37	3·5	Megaloblas
4	..	..	17·5	Normoblas
5	42	1·43	35·5	..
6	..	..	38·6 (peak)	..
15	58	2·93	2·1	..
22	62	3·01	<1	..
29	72	3·50	<1	..
36	72	3·55	<1	..
43	72	3·45	<1	..
48	78	3·64	<1	..
53	78	3·87	<1	..
58	84	4·09	<1	..
65	80	3·68	<1	..
72	84	4·28	<1	..
78	94	4·65	<1	..

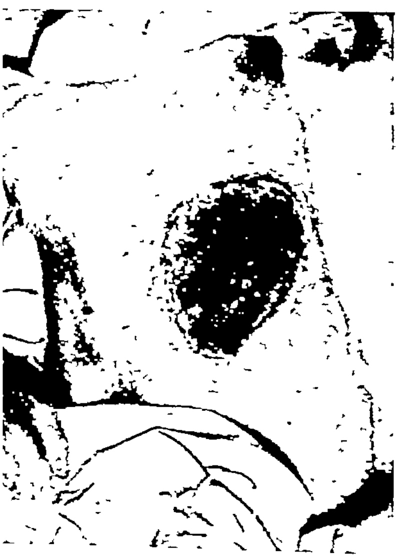
Therapy.—20 mg. folic acid by mouth on 1st to 10th da 10 mg. folic acid by mouth on 11th to 20th days; 10 mg. folic aci by mouth on 22nd to 65th days. Ferrous sulphate gr. vi t.i.d. o 38th to 65th days. Anahæmin 4 c.cm. i.m. on 48th, 52nd, a 55th days. Proteolysed liver, one tablespoonful t.i.d. on 65th t 78th days.

itary history, but he said that he had served all over the ld but had never had dysentery. The beginning of the ss he attributed to a "strain," the result of lifting heavy ls, which caused a "lump" to appear in the left lower omen. This was associated with diarrhœa, tenesmus, piles.

Ie was admitted to hospital, where his stools were examined hout anything being found to explain the diarrhœa. He was told that he had cancer of the bowel, and left iliac colostomy was performed, presumably preparatory to removal of the "growth."

After the operation a large infected area developed round the colostomy, and it was only by diathermy excision that further spread was prevented.

The patient had been discharged from the Service and had been sent to Queen ry's Hospital for further investigation and treatment. it was less than six months since his operation and he s anxious to go home to help with the harvest, he was charged and instructed to return later for closure of ostomy.



œbiasis of skin following closure of colostomy

He was later readmitted to Queen Mary's Hospital, when was in good health. There was no blood or mucus in the ols. For four days before operation he was given succinyl phathiazole tablets to sterilise, as far as possible, the itents of the large intestine.

At operation the colostomy was dissected free. In spite extensive scarring of the abdominal wall, the bowel was bilised without much difficulty and without the peritoneal ity being entered. Continuity of the bowel was reablished, and the layers of the wound were drawn together er a small drainage-tube.

The wound progressed well for three days but then became itely inflamed and broke down completely. The sutures the bowel also gave way, with re-establishment of the ostomy.

During the next four weeks the infected area continued to ead in spite of every form of treatment, local and general. e inflamed area extended almost from the iliac crest to the tal margin and consisted of foul sloughing tissue (see ire). The patient's general condition was rapidly erlorating.

Reviewing the case, the possibility of amœbiasis occurred me, even though examination of the stools elsewhere had parently proved negative. A fresh specimen was examined Dr. Mackenzie Douglas, who reported the presence of nerous *E. histolyticæ*.

The further care of the patient was then undertaken by J. G. Willmore, to whom I am indebted for an account of treatment. Intramuscular emetine gr. 1 was given daily twelve days, and 'Diodoquin' 2 tablets by mouth ce daily for ten days. The local area was kept as dry possible, and for this reason the bowel was not irrigated h 'Quinoxyl'; the sloughing wound was dusted vily with a powder consisting of equal parts of ium penicillin and succinyl sulphathiazole and covered h tulle-gras.

he stools rapidly became clear of amœbæ, the man's general dition improved rapidly, and a striking feature was the ppearance of the agonising pain in the wound and its d healing.

DISCUSSION

This was one of our earlier cases and occurred before I had come to consider that a colostomy without any lesion to explain it was almost pathognomonic of amœbiasis. It was thought advisable to publish the case in view of the possibility of surgeons in different parts of the country having to deal with colostomies of this type—i.e., where investigation proves negative and amœbæ are not found in the fæces.

Amœbiasis of the skin was originally described in 1892 by Nasse (cited by Manson-Bahr 1938), who recorded a case of ruptured liver abscess with invasion of the skin. Nasse recognised living entamœbæ not only in the liver pus but also in the skin at the advancing edges of ulceration.

Hsu (cited by Manson-Bahr 1938), in China in 1937, described circum-anal ulcerations, fistulæ, and warts, due to dysentery amœbæ. He demonstrated the organism in sections, in erosions of the cervix, and in urethral ulcers in the male.

Manson-Bahr (1938) described a case similar to the one recorded above, in which the parietes in the vicinity of the colostomy and abdominal wall were involved. He emphasises the fact that this peculiar gangrene, with its colour, method of spread, and punched-out margins of ulceration, cannot be forgotten or confused with any other form of gangrene or ulceration of the skin. He further emphasises the importance of microscopical sections of the gangrenous skin, where the amœbæ will be found, even though they may not have been found in the stools.

Gabriel (cited by Manson-Bahr 1938) reported a case in an ex-soldier who had served in India fifteen years previously. Though the patient had never had clinical dysentery, *E. histolytica* cysts were present in the fæces. The lower part of the rectum, the pelvic floor, and the perineal tissues had been destroyed. Response to emetine therapy was remarkable.

It may be as well to call attention to the converse of the error described above—i.e., where patients with carcinoma of the rectum have been treated for dysentery. I have seen two such cases. In each the mistake was due to the omission of digital examination of the rectum. Both patients had been sigmoidoscoped and examined with X rays and barium enema. In both the carcinoma was situated low down in the rectum; in one it involved the side wall, and in the other the growth completely encircled the bowel. In the first case the sigmoidoscope was passed beyond the ulcer without suspicion, whereas in the second it was evidently passed through and beyond the growth before observation began. Both patients had been treated elsewhere for amœbic dysentery and had been referred for operation for hæmorrhoids.

The barium enema does not help much in the diagnosis of neoplastic conditions of the rectum, particularly those situated low down, for the delineation of a filling defect with barium does not properly begin until the pelvirectal junction is reached. It is equally possible to miss a carcinoma of the rectum with the sigmoidoscope, and this emphasises the fact that the first internal examination should always be with the finger. The patient should be requested to strain down so that an ulcer, which at first may not be palpable, may come within the ambit of the examining finger.

I am indebted to Sir Walter Haward, D.M.S. Ministry of Pensions, and Major-General Brooke Purdon, medical superintendent, Queen Mary's Hospital, Roehampton, for permission to publish this article.

REFERENCES

Howells, G. (1946) *Brit. med. J.* i, 161.
Manson-Bahr, P. H. (1938) *Trans. R. Soc. trop. Med. Hyg.* 32, 223
— (1945) Manson's Tropical Diseases, London.
Morgan, C. I. N. (1946) *Proc. R. Soc. Med.* (in the press).
Ogilvie, W. H. (1945) *Lancet*, ii, 585.

It is of interest to note that cases 7 and 9 had previously responded to proteolysed liver. Since megaloblastic anæmias, refractory to anahæmin, will respond to both proteolysed liver and folic acid, it might be postulated that folic acid is the active principle in proteolysed liver. The data obtained in cases 7 and 8, however, indicate that a refractory megaloblastic anæmia can respond to proteolysed liver after folic acid has ceased to be effective. This would suggest that in liver and proteolysed liver there exists some as yet undiscovered anti-anæmic principle additional to the specific anti-anæmic factor in anahæmin, and to folic acid.

SUMMARY

An account is given of the response of six cases of addisonian pernicious anæmia and three cases of refractory megaloblastic anæmia to folic acid.

In all cases the bone-marrow was transformed from a megaloblastic to a normoblastic state.

The effective daily dose of folic acid given by mouth to cases of pernicious anæmia in the relapse stage varies widely in different patients. The suggested dose is 20 mg. daily.

Three cases of megaloblastic anæmia refractory to 'Anahæmin' responded to folic acid which was, however, unable to restore the blood to normal.

The relationship of folic acid to proteolysed liver is discussed.

REFERENCES

Cooke, W. T., Elkes, J. J., Frazer, A. C., Parker, J., Peeney, A. L. P., Sammons, H. G., Thomas, G. (1946) *Quart. J. Med.* 15, 141.
Davis, L. J., Davidson, L. S. P. (1944) *Ibid*, 13, 53.
Lancet (1946a) Annotation, i, 927.
— (1946b) Annotation, i, 969.
Spies, T. D. (1946) *Lancet*, i, 225.
Wilkinson, J. F., Israëls, M. C. G., Fletcher, F. (1946) *Ibid*, August 3, p. 156.

CONFUSION OF AMŒBOMA WITH CARCINOMA

MICHAEL J. SMYTH
M.Ch. N.U.I., F.R.C.S.
SURGEON, QUEEN MARY'S HOSPITAL, ROEHAMPTON

THE many abdominal cases admitted to Queen Mary's Hospital, Roehampton, during the later years of the war 1939–45 included some in which left iliac colostomy had been performed for no apparent reason. The patients had not sustained any wounds affecting the pelvic colon or the rectum. Digital examination of the rectum, sigmoidoscopy, and barium enema did not reveal any lesion which would have justified operation. In some cases the operation had been advised for neoplasm of the rectum, and in others a definite diagnosis of carcinoma had been made, yet no trace of any new growth could be found. At first I naturally thought that a mistake had been made, that overwork, perhaps the heat and burden of the desert, had been responsible for a "phantom tumour"; but, as other cases followed, and as the operation had been advised, and in some instances carried out, by well-known surgeons, it was clear that there must have been some compelling reason for operation. The answer was not far to seek, though at first it was not obvious.

In tropical regions where amœbiasis is endemic *Entamœba histolytica* may cause in the large intestine a granulomatous condition which is often mistaken for carcinoma. A good example is cited by Ogilvie (1945). A factor common to the patients mentioned above was that they had all had amœbic dysentery, and all except one had been treated with emetine. The logical conclusion was that the colostomy had been performed for an "amœboma" of the rectum or of the pelvic colon, and that the operation, with or without emetine, had brought about the disappearance of the tumour.

Manson-Bahr (1945) has emphasised that amœbiasis is more widespread than is commonly realised, and that not only can it be contracted without causing pronounced symptoms, but also it may lie dormant for years before declaring itself. He has described (personal communication) the case of an officer who contracted the disease at the age of 2 years and developed a liver abscess at the age of 28, with no symptoms during the intervening years. A similar case was seen by one of my colleagues, *Dr. J. G. Willmore. Here*, a retired warrant officer who had contracted dysentery in the Burmese war 1885, developed a large liver abscess in 1922, [illegible] signs of illness and without having left *England* [illegible] the intervening years.

It is important that the prevalence of amœbiasis should be recognised, and that surgeons should be [illegible] to the possibility of amœbic granuloma simulating carcinoma. I have no doubt that in amœboma of the rectum colostomy is helpful rather than otherwise, but the [illegible] is that large-scale operations on the bowel may [illegible] performed without any attempt at differential diagnosis. Some even question the advisability of colostomy [illegible] such cases and look upon the operation as unnecessary and somewhat drastic. It is easy to be wise after [illegible] event, when the nature of the tumour is realised, but [illegible] man on the spot is often in the best position to judge and the operation may have been the best for the patient in the circumstances. One might go further and [illegible] that, whatever the diagnosis, colostomy in the presence of acute or subacute obstruction was the only correct surgical procedure and, as a temporary expedient, undoubtedly saved life.

Radical surgery, such as resection of the colon [illegible] excision of the rectum, is much more serious. In three cases reported by Gunn and Howard (cited by Howells 1946) the preoperative diagnoses were carcinoma [illegible] transverse colon, carcinoma of cæcum, and carcinoma of colon. Two of the patients died as a direct result [illegible] operation. Yeomans (*cited by Howells 1946*) *emphasises the almost invariably fatal outcome* of radical surgery without anti-amœbic treatment.

If a tumour of the colon or of the rectum is discovered in a person who has served in the East, it would be wise to regard it as an amœboma rather than a carcinoma until thorough pathological examination has proved otherwise. In amœboma of the colon special care [illegible] repeated examination of the stools may be necessary before *E. histolytica* is demonstrated. With accessible tumours, like those of the rectum, a biopsy should not be omitted, for the specimen may not only help to distinguish a neoplasm from an inflammatory condition *but also provide evidence of E. histolytica* cysts. Failing the services of a pathologist experienced in tropical protozoology, a course of emetine should precede any attempt at radical surgery.

Occasionally amœboma and carcinoma may coexist. Morgan (1946) reported the case of a young R.A.F. officer with a swelling in the right *iliac fossa*. Investigation proved that he had contracted amœbic dysentery and appropriate treatment led to almost complete disappearance of the tumour. The patient reported [illegible] hospital later, when it was found that the swelling had recurred; and, owing to the failure of further treatment operation was decided on. On removal of the cæcum the tumour proved to be carcinomatous.

AMŒBIASIS OF SKIN AND SUBCUTANEOUS TISSUE

I wish to draw attention to a condition which may affect the skin and underlying tissues and may readily develop after colostomy performed for such cases, when amœbiasis is not suspected.

A colour-sergeant of the Royal Marines, aged 57, was admitted to Queen Mary's Hospital, Roehampton, with diagnosis of carcinoma of rectum. There was little [illegible] t but a metabolic disturbance, and it is thought in gout uric acid probably circulates in an abnormal . This explains why the kidneys cannot eliminate uric acid, which consequently collects in the blood. ratosis, as opposed to hyperuricæmia, is absolutely ined to gout and is pathognomonic of it. Though osis probably does not occur in the absence of hyper- æmia, the latter may exist for prolonged periods iout inducing the occurrence of uratosis—i.e., gout. s thought that in gout the uric-acid salts which have umulated in the blood alter from a soluble to a less ible state, the blood becomes supersaturated, and tes are suddenly deposited from the supersaturated tion. Inflammation is excited mechanically by the osition of urate crystals in the affected tissues, and a ty paroxysm results.

n the present case the attack of gout came on in a ient who, except for age and sex, did not show the al predisposing factors cited in gout, such as heredity l habitual excesses in food and drink. This case thus fers from that reported by Vining and Thomson (1934), which there was a family history of gout. They sidered that the obvious explanation in their case s that in the leukæmic state there were present large ntities of uric acid from the breakdown of immature ite cells which, in a subject carrying a latent tendency gout, led to uratosis. The attack of gout in my patient s apparently produced as a direct result of the greatly reased uric-acid content of the blood resulting from rapid destruction of white blood corpuscles. After first dose of 100 r the white-cell count was reduced in a days from 354,000 to 225,000 per c.mm., and it was this time that the attack of gout developed. It there- e seems that acute gout can, though apparently very rely, result purely from the increased amount of uric id in the blood which occurs in leukæmia.

REFERENCES

nner, H. (1932) *Z. klin. Med.* 121, 700.
rkner, C. E. (1938) Leukemia and Allied Disorders, New York.
berts, W., Bradford, J. R. (1907) In Allbutt and Rolleston's System of Medicine, London, vol. III, p. 123.
aultz, A. (1931) *Virchows Arch.* 280, 519.
ning, C. W., Thomson, J. G. (1934) *Arch. Dis. Childh.* 9, 277.

TUBERCULOUS ABSCESS FOLLOWING INTRAMUSCULAR PENICILLIN

REPORT OF A CASE

DENIS EBRILL
M.S. Lond., F.R.C.S.
SIDENT ASSISTANT SURGEON

STEPHEN D. ELEK
M.D. Lond., D.P.H., D.C.P.
ASSISTANT BACTERIOLOGIST

ST. GEORGE'S HOSPITAL, LONDON

So far as we know, tuberculous infection at the site of nicillin injections has not been described. Abscesses erile on routine examination are not infrequent; but ey are not always examined for tubercle bacilli. We ve observed a case in which there is reason to believe at penicillin administration was responsible for a berculous abscess. Theoretically, direct inoculation the time of injection appears to be possible. If this is —and the case to be described appears to bear it out— is an indication for more stringent precautions in the ministration of penicillin.

A boy, aged 11 years, with no relevant previous medical story, was admitted on July 24, 1945, with a large painful scess in the right axilla which had been present for about week. Two days after admission the abscess had become ft and was opened. The pus gave a pure growth of *Staph. ureus.* On the 30th a continuous intramuscular penicillin ip was set up. The initial site of injection was the outer pect of the upper third of the left thigh. During the first enty-four hours patient complained of much discomfort the site of injection, whereupon the drip was discontinued d a fresh one put up in a similar site in the right leg. The nicillin was discontinued on August 3, by which time he had d 500,000 units. On the 22nd patient was discharged, with his wound healed and no evidence of any residual suppuration.

On Nov. 30—i.e., some three months later—he again attended hospital, complaining of a painful swelling in the left thigh near the site of his first penicillin injection. A spherical fluctuant swelling, about 3 inches in diameter, was found on the lateral aspect of the upper third of his left thigh. There was no evidence of skin involvement, and the swelling was only slightly tender. A chronic abscess seemed the most likely diagnosis, infection by one of the common penicillin-resistant contaminants being postulated. He was admitted to hospital three days later, the swelling having increased in size during this period. On Dec. 5 the abscess was explored through a small incision and about 8 oz. of thin yellowish fluid and some fibrinous clots were evacuated. The bacteriological report on the pus was as follows: "Routine cultures sterile. Morphological *Myco. tuberculosis* present in large numbers in the direct smear." Later the acid-fast bacilli were confirmed to be *Myco. tuberculosis* by culture and by guineapig inoculation.

The abscess did not heal, and exuberant granulation tissue appeared in the wound. Histological examination of this showed typical tuberculous granulation tissue. Radiography of his chest, spine, and legs showed no abnormality. At this time his Mantoux reaction was positive in 1 in 10,000 O.T.

On Jan. 7, 1946, an attempt was made to excise the tuberculous area completely. A large diffuse area of necrotic tissue was found extending superficial and deep to the fascia lata and tracking in the intermuscular planes almost as far as the shaft of the femur. At no point could the bone be felt to be directly involved. The pathological tissue was excised. The wound was closed completely, apart from a small drain at its lower extremity, which was removed on the second day. Complete healing was eventually obtained.

DISCUSSION

The history of the case suggests that a hæmatoma formed at the site of the first penicillin injection. This would explain the severe pain noticed at the time. Human blood is an excellent medium for the growth of tubercle bacilli, and early evidence of growth can be observed in two or three days.[1] We have observed that the addition of penicillin to laked human blood appears to improve the growth of tubercle bacilli. One of us has found in in-vitro experiments that this is especially so when the concentration of penicillin in the blood is low. The optimal concentration appears to be about 20 units per c.cm. When the concentration of penicillin is very high, this adjuvant effect disappears. Furthermore, by keeping the hæmatoma sterile, penicillin would prevent it from being overgrown with contaminants which would interfere with the growth of tubercle bacilli.

Regarding the source of the tuberculous infection, the most obvious and indeed the most likely solution is that it was introduced at the time of the injection. Tubercle bacilli might have gained access to the penicillin powder, the diluted penicillin solution, or the apparatus or needle used. The infection could have been conveyed by one of the people dealing with these. The two house-officers setting up the drip were radiographed with negative results, but a further endeavour to pin-point the source of infection after a lapse of months is likely to be profitless.

The other, less likely, possibilities are as follows:

(1) That a sterile hæmatoma formed at the site of the injection, which was infected from a transient tuberculous bacteræmia from some other source. This can be dismissed as a practical possibility, as we have been unable to find any evidence of tuberculosis elsewhere.

(2) That the injection activated a pre-existing localised focus of tuberculosis, such as a lymph-gland or a bursa. We regard this as equally unlikely, since no such structures are described in this position.

(3) That the infection tracked as a cold abscess from some distant source and was not connected with the penicillin therapy. We have conducted an exhaustive search in an endeavour to prove this happy solution, but clinically and radiologically we have been unable to do so. At this

---

[1] Pryce, D. M. *J. Path. Bact.* 1941, 53, 327.

GOUT IN LEUKÆMIA

REPORT OF A CASE

L. M. SHORVON
M.B. Lond., D.A., D.C.H., D.P.M., D.M.R., D.M.R.T.
SENIOR RADIOTHERAPIST, E.M.S. CENTRE, MOUNT VERNON HOSPITAL, MIDDLESEX

IT has long been a matter of great interest that, though the uric-acid content of the blood is increased in leukæmia, gout hardly ever occurs in this condition.

Forkner (1938), in his exhaustive monograph, could only cite Roberts and Rose Bradford (1907), Schultz (1931), Brunner (1932), and Vining and Thomson (1934) as having reported cases in which the two diseases coexisted.

Roberts and Rose Bradford, in their article on gout, state that "in myeloid leukæmia the quantity of uric acid produced and voided in the urine is greatly increased, and it might have been expected that persons so affected would exhibit a strong proclivity to gout. This, however, does not appear to be the case." They only encountered one patient in whom the two diseases were associated, and that patient had had gout for many years before myelogenous leukæmia arose. They could find no case in which gout supervened as a result of myeloid leukæmia.

Vining and Thomson, in reporting their case of gout and aleukæmic leukæmia in a boy aged 5 years, also state that they could find no case in the literature of gout supervening on a leukæmia.

The present case is thus of special interest in that acute gout developed for the first time in a patient undergoing treatment for leukæmia.

CASE-RECORD

A man, aged 37, was admitted to Mount Vernon Hospital under my care on May 16, 1945. He complained that for the previous ten weeks he had been feeling "sluggish," his abdomen had been getting prominent, and he was dyspnœic on exertion. He had no cough, loss of weight, or pain, and bowels and micturition were normal. There was no family history of gout or leukæmia. The personal history showed that he had had pleurisy in 1931 and 1935. He had been to India but had not contracted any illness there.

On examination he was of rather spare build, with slight pallor of skin and conjunctivæ. Abdomen enlarged; no petechiæ. Throat clean, tonsils moderately enlarged, no gingivitis, teeth in good condition. Clinical examination of lungs showed no abnormality except a slight pleural rub audible at the level of the seventh rib in the left axillary line, probably the result of previous pleurisy. Trachea central. Heart showed no enlargement, no murmurs, and rhythm regular.

The abdomen was distended, practically the whole of it being occupied by an enormous spleen, which formed a firm smooth non-tender swelling which descended from und left costal margin right across the abdomen and down to right iliac fossa, with well-marked notches on the an border. No enlargement of liver, no ascites, no pel glands, no sternal tenderness. Ophthalmoscopic examin was normal.

Examination of the blood next day showed Hb 56%, white cells 354,000 per c.mm. (polymorphs 42%, lympho 3%, myelocytes 46%, and myeloblasts 9%).

The diagnosis of chronic myeloid leukæmia was definitely established, and it was decided to treat the by deep X-ray therapy applied to the spleen. This started on the 18th. The factors used were kV 190, an filter of 0·5 mm. Cu, focus skin distance 40 cm., size of 10 × 15 cm. Each treatment consisted of 100 r incident the spleen.

Three days later, May 21, the patient developed a ty attack of acute gout. He complained of sudden ons severe pain in the right toe. His temperature was 99·5 The metatarsophalangeal joint of the right great toe bluish red, somewhat swollen, and very tender. The sit maximal tenderness was on the medial aspect of the The pain was aggravated by pressure and movement. other joint was affected.

Progress.—I treated the patient with colchicum an decided to continue the rontgen therapy. The affected j during the subsequent few days became more swollen, the pain was kept in check with colchicum. Ten days the onset of acute gout the swelling of the joint to subside and the temperature became normal. Th leukæmia improved, and the spleen became materially smal Irradiation was discontinued on June 1. The tab summarises blood examinations performed between May 1 and July 4.

The patient left the hospital on July 5 feeling very fit

OBSERVATIONS DURING TREATMENT

Date 1945	Deep X-ray treatment	Hb (%)	White cells	Uric acid in blood*	Date 1945	Hb (%)	White cells	Uric acid in blood*
May 17	..	56	354,000	..	June 2	68	58,000	..
„ 18	100 r to spleen	..	..	..	„ 4	64	25,200	..
„ 22		54	225,000	..	„ 6	76	29,000	4·9
„ 23		..	..	4·9	„ 8	72	19,000	5·1
„ 24		54	244,000	..	„ 13	78	13,800	5·2
„ 25		..	..	..	„ 15	..	18,800	6·4
„ 26		56	277,000	..	„ 18	..	13,500	6·4
„ 28		60	137,000	..	„ 20	86	18,600	5·6
„ 29		..	..	..	„ 22	..	15,000	6·0
„ 30		..	..	5·1	„ 25	92	11,700	5·7
„ 31		62	76,000	..	„ 27	96	11,400	4·9
June 1		..	..	..	July 4	..	..	3·2

* mg. per 100 c.cm.

DISCUSSION

Gout is commonly regarded as a disordered pur metabolism characterised by (1) recurring attacks o acute arthritis, (2) an excess of uric acid in the blood i.e., hyperuricæmia, and (3) deposition of urates in th cartilages of the joints and in other structures. Of th joints, the commonest to be affected is the metatar phalangeal joint of the great toe, and this was the *involved in the present case.*

The normal limits of the uric-acid content of blood are 0·7–3·7 mg. per 100 c.cm., with an average 2 mg. per 100 c.cm. In gout the uric-acid content of blood may be increased to an amount two or three ti as great as that in normal blood. Hyperuricæmia is n however, confined to gout and occurs in conditions which gout is almost unknown, notably in cases of re insufficiency, pneumonia, and leukæmia. It has be stated that uric acid is the first nitrogenous constitu to be retained in renal insufficiency, and in uræmia th uric-acid content of the blood may be very large. I pneumonia and leukæmia the increased amount o uric acid in the blood is due to the considerable destr tion of the nuclei of the leucocytes. In these diseases th kidneys excrete large quantities of uric acid but cert eliminate the uric acid as rapidly as it is formed.

The way in which the increased amount of uric a in the blood is produced in leukæmia is briefly as follo The nucleoprotein of the nuclei of the leucocytes broken down by enzymes. It is first hydrolysed, prot molecules being split off and nucleic acid liberated. Th latter consists of 4-nucleotides (H_3PO_4 + base + carb hydrate). The carbohydrate present is either a hex or a pentose. The bases are pyrimidines and puri the latter being adenine (6-aminopurine) and guan (2-amino-6-oxypurine). In the tissues, more especially in the liver, adenine and *guanine are* deaminised hypoxanthine (6-oxypurine) and xanthine (2, 6-diox purine). Hypoxanthine is oxidised to xanthine and th latter to uric acid (2, 6, 8-trioxypurine).

In gout the increase of uric acid in the blood is not regarded as due to increased production as in leukæm but as probably due to diminished excretion by kidn with normal production. Gout is not a primary re *ispension.*—A single light-weight and readily adjust- elastic band passing just below the lobes of the ears 2) holds the mask in position. The simple ring- hook fastening permits of rapid removal with one d (useful in cases of vomiting, &c.).

eservoir Bag.—The thin latex bag is very similar to B.L.B. design. Its patency is ensured by the posi- of the inlet tube, which holds its neck open (fig. 3). rainage plug is provided in the bottom of the bag the removal of excessive fluid due to condensation. conical bag made from thin ($^{6}/_{1000}$–$^{8}/_{1000}$ in.) -toxic polyvinyl chloride sheet and sealed by heat in igh-frequency electric field may be used instead of latex bag. The polyvinyl chloride bag is cheaper, es indefinitely, and is less vulnerable ; but the latex is more elastic.

nlet Tube.—This is made by extrusion of polyvinyl oride and has an internal diameter of $^{1}/_{8}$ in. The narrow e and fine tube are an innovation which much reduces ght and bulk.

ADVANTAGES

ince the mask incorporates the reservoir-bag partial- reathing principle, it is economical in gas. In aviation s efficient up to an altitude of 30,000 ft. in warm air- ft, maintaining a satisfactory oxygen saturation of blood with the user at rest and on minimal standard gen flows.

omfort.—The chief advantage in this mask lies in its lightness, the entire assembly weighing only $1^{1}/_{2}$ oz. The great reduction in weight adds enormously to the wearer's comfort, which is further enhanced by the smooth finish of the mask and the low resistance to breathing.

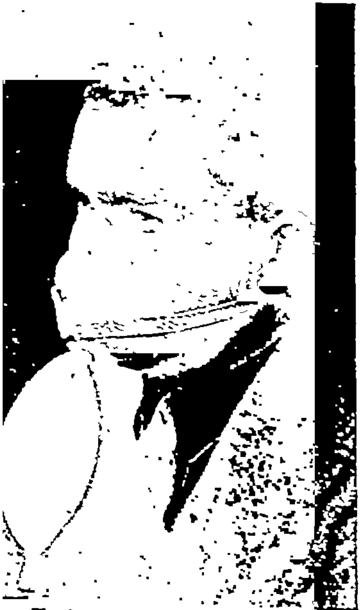


Fig. 2—Mask and bag in position.

Plasticity.—The plasticity of polythene varies imperceptibly with large changes of temperature; in this useful characteristic it is unlike plastics of the polyvinyl chlor- e group, which are renowned for variability of plasticity th fluctuations of temperature.

Sterilisation and Cleanliness.—The extremely low cost the finished article enables it to be thrown away after e, thus overcoming the usual difficulties and incon- nience of sterilisation. This is particularly advan- geous in cases of phthisis and infectious diseases of all pes. If it is desired to retain the mask, it can easily washed and treated with antiseptic solutions. Its smooth finish facilitates removal of sweat, dirt, and condensation.

Acoustics.—Because of the position of the ventilation orifice, conversation is well heard through the mask.

APPLICATION IN MEDICINE

The equipment can be used for routine oxygen therapy in the same manner as the well-established B.L.B. mask and with similar oxygen flows and consumption. For average cases the flow can be adjusted so that the bag remains a little inflated at the end of inspiration.

The mask is less conspicuous if the face-piece is made flesh-coloured or almost transparent. Attractive colours might be a boon in the pædiatric department.

The advantages of so light a mask on the face of a patient in extremis are obvious, the weight being less than a sixth of that of the standard B.L.B. design.

A similar type of transparent face-piece for anæsthetic purposes would provide a mask of less than a twelfth of the weight of those in current use. It would also enable the anæsthetist to observe through the mask itself whether the patient was breathing through nose or mouth, the colour of his lips, the squeezing and pinching of soft tissues, the position of the airway, &c.

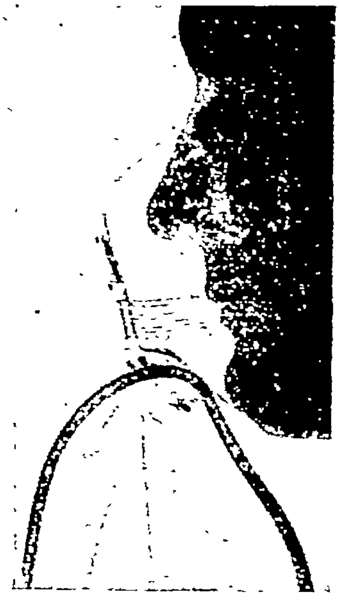


Fig. 3—Radiogram showing how the mask bears directly on bony points above and below, and how the inlet tube keeps the neck of the bag patent.

SUMMARY

A light-weight oxygen mask of new design, with a plastic (polythene) face-piece, though designed for aviation, could readily be applied to anæsthesia and oxygen therapy.

The complete assembly weighs only $1^{1}/_{2}$ oz. The face-piece is so cheap that it can be thrown away after use, is inconspicuous, and interferes little with conversation.

I am indebted to the Director-General, Medical Branch, Royal Air Force, for permission to publish this paper; to the Director of the Institute of Aviation Medicine, Farnborough, where the development was carried out; and to those colleagues who assisted, criticised, and encouraged, particularly Flight-Lieutenant A. J. Barwood and Flying Officer J. D. Wilson.

PICROTOXIN IN BARBITURATE OVERDOSAGE

T. Nauth Misir
M.B. Lond.
ASSISTANT MEDICAL OFFICER, OLDCHURCH COUNTY HOSPITAL, ROMFORD

Picrotoxin is now accepted as the drug of choice in the treatment of barbiturate poisoning. It is a powerful convulsant which acts mainly on the medullary centres, stimulating in particular the respiratory centre.

Duff and Dille (1939) have proved by animal experiments that picrotoxin rapidly disappears from the blood. Very soon after injection the blood-picrotoxin level falls and becomes steady in about 20 min. After 2 hours the quantity in the blood is negligible as picrotoxin is taken up by the tissues. For this reason the drug should be given either intravenously or intramuscularly in small doses and at short intervals—e.g., 15–30 min. Only in this way can an effective concentration be maintained in the blood.

Overdosage of picrotoxin manifests itself by convulsions, which can be countered by the slow intravenous stage it does not seem likely that such a hidden focus would remain obscure.

On the assumption that the infection was introduced at the time of the penicillin therapy, the incubation period, until clinical manifestations appeared, was about four months.

Our chief reason for publishing the case is to draw attention to this serious complication of penicillin therapy. We appreciate the fact that the probable solution lies in some flaw in the aseptic technique used, though it is possible that the infection gained access to the penicillin during its manufacture. Penicillin is now used so extensively that it is not unlikely that similar cases might occur. Knowledge of the possibility of this happening would lead, we hope, to added care in its administration. It should at least lead to a routine examination of post-penicillin abscesses with a view to excluding tuberculosis.

SUMMARY

A tuberculous abscess developed at the site of intramuscular injections of penicillin.

The *infection took about four months to cause* symptoms.

The source of the infection was in all probability either the penicillin or the apparatus for its administration.

Post-penicillin abscesses should be examined for evidence of tuberculosis.

The importance of aseptic technique in the administration of penicillin is emphasised.

Our thanks are due to Sir Claude Frankau, under whose care the patient was admitted, for permission to publish this case.

LIGHT-WEIGHT OXYGEN MASK OF PLASTIC MATERIAL

BASIL S. KENT
M.B. Lond., D.A.
LATE SQUADRON-LEADER R A.F.V.R.
From the R.A F. Institute of Aviation Medicine, Farnborough, Hants

THE mask to be described was primarily designed as a passengers' disposable oxygen mask for altitude flying in the Royal Air Force, but it should have a wide field of utility in anæsthesia and oxygen therapy.

Various materials were tried, such as rubber, paper (including paper impregnated with resins and plastics), cardboards, papier mâché, fabrics (including plastic-coated and doped fabrics), metals (notably aluminium), and plastics. As a result of these investigations polythene was considered to be the most suitable material. Polyvinyl chloride or cellulose acetate can be used but have some disadvantages.

CHARACTERISTICS OF POLYTHENE

Polythene, an odourless vinyl-type resin and a simple polymer of ethylene, was developed in this country by Imperial Chemical Industries Ltd. and is sold under the trade name of 'Alkathene.' It is a thermoplastic material which readily lends itself to both compression and injection moulding. Despite its delicate appearance and the thinness to which it can be moulded, it is very strong, pliable, and resistant to tearing, though extremely light. Owing to the inert nature of polythene, a mask made of it is virtually non-irritant and does not cause dermatitis, as rubber mouldings sometimes do. Polythene will burn, but less vigorously than rubber. It costs about 1s. 2d. per lb. Since a polythene face-piece weighs about $^1/_2$ oz., the material for each will cost about $^1/_4$d. Polythene is 100% reclaimable—i.e., it can readily be remoulded and used again.

THE MASK

The mask consists of a thin polythene face-piece to cover the nose and mouth, incorporating a gauze-covered ventilation orifice and slots for a single elastic strap, reservoir bag, into which oxygen is delivered throu fine inlet tube, is attached (figs. 1 and 2).

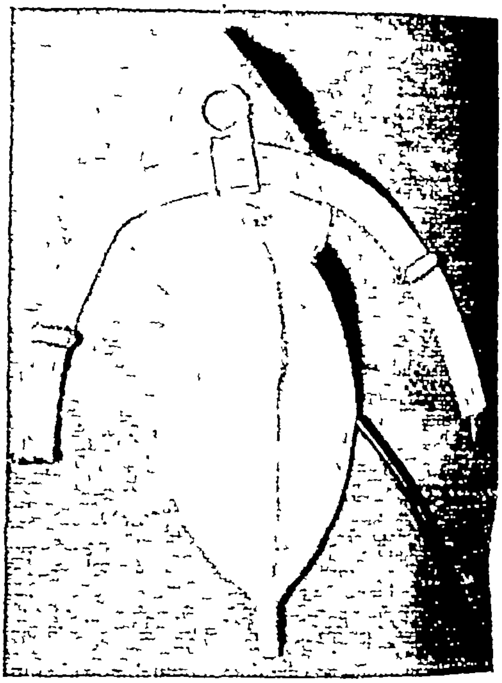


Fig. 1—Polythene mask and latex reservoir bag.

Face-piece.—The oronasal moulding has been to fit on the face and not over the face. The ne for odd appendages has been eliminated, as the operating as *both inlet and outlet valves, the* slot the suspension strap, and the bevelled turret over the reservoir bag is slipped are incorporated in the moulding. The shape gives a reasonably curve tapered bearing surface round the periphery. In a mask to fit the face, the measurement from the of the nose to the tip of the chin (the nasion- is most important; radiography shows (fig. 3) th this axis the bearing points of the face-piece are di over bone—the nasal bone above, and the tip of mandible below—and that the face-piece has shaped to stand well clear of the nasal contour, varies widely from subject to subject. A comfort visual field has been retained, and glasses may be with the mask in position. A suitable dead space— 75 c.cm. on an average face—has been achieved orifice housing, the suspension slots, and the most for point of the bevelled turret are in alignment, so f tating packing and eliminating the projections easily catch in aircraft fittings, bed-clothes, &c. Th type of mask can be made in different sizes to children or adults.

The face-piece is made by injection moulding, liquid polythene being forced into a special mould u high pressure. Advantages of this method are rapidit *output by unskilled labour (about fifty* times as fa rubber moulding), cheapness, uniformity of shape, a very low rejection-rate combined with econom material, since all trimmings and rejects are reclaim

Ventilation Orifice.—A phosphor-bronze gauze (mesh) covering an orifice 11 mm. in diameter act both an inhalation and an exhalation valve. The resist of this arrangement is so low as to be unnoticed even wh no gas is flowing. It will adequately cope with inspiratory and expiratory velocities. The position the orifice does not cause overdilution of the inspi gases. Turbulence created by the gauze mesh advantage at high inspiratory and expiratory flow was much to suggest that the focus he described from primary infection. As Scheel and Heimbeck emphasised in 1928, the problem must be solved repeated examination of individuals with primary tions. In 1938 Malmros and Hedvall had claimed phthisis started in small or moderate-sized cloudy s, which were often multiple and might originate in supraclavicular region and/or in the first intercostal e. In 1944 Frostad had shown that of 135 cases hthisis 48 had developed directly by breakdown from primary focus or its immediate vicinity; in many s he had demonstrated cavitation in the primary ction area. By a series of X-ray examinations, he also shown in 11 cases that the quiescent primary us was reactivated after a long interval, breaking down destructive pulmonary tuberculosis: in others tructive pulmonary tuberculosis developed from an irely new infiltration at another site.

Dr. Ustvedt said that phthisis could develop in the owing ways: (1) direct from the primary lesion or neighbourhood; (2) by reactivation of latent primary i; (3) from metastatic foci of hæmatogenous, lympho- ous, or bronchogenic origin; or (4) through new foci superinfection. It was thus important to detect mary infection, and to observe it carefully for the t few years.

Dr. S. Roodhouse Gloyne (London) asked whether ividual morbidity was related to the typical mortality ves. There was evidence that many primary infec- ns occurred outside childhood. To recall Koch's phe- menon, the most significant part was the necrosis— cardinal sign of the reinfection—and this could be oduced with a large enough dose in the primarily ected guineapig, in which the naturally progressive ease was its own sensitising agent. But had the enomenon any relation to haphazard infection in an? There were two schools of thought. According one, man was infected only once in his lifetime and bsequent tuberculous disease resulted from the main- nance of the original infection. The other held that esh infection was possible, but paid little heed to the e of the all-important original dose.

Precise knowledge of the time-sequence in the "post- imary" phase was lacking. Perifocal satellite lesions ound the primary focus spread to the lymphoid llicles in the walls of the small bronchi. The disease ight then become indolent or quiescent or it might ogress until a small caseous lesion ulcerated into a onchus; this marked the end of the postprimary age and the beginning of the chronic bronchogenic cavating lesion of the adult, of which the outward sign as sputum. On the whole, the evidence for the com- ete healing of the primary complex in childhood was ot conclusive, though abdominal and, still more, cervical imaries tended to heal.

Terplan had shown that age of onset did not neces- rily influence the anatomical appearances of primary fection. He had also collated a series of post-mortem cords in which the first infection was represented by fully calcified complex whilst another complex of a esh infection was also present. He had, moreover, corded cases with primary foci and foci of true exo- nous infection.

The most difficult lesions to assess in the adult were e three types of solitary spherical foci: (1) Assmann's, caseous pneumonic infraclavicular lesion; (2) the rcular focus of Fraenkel confined to no special area of ng; and (3) the pulmonary tuberculoma, probably similar structure to (2). As to the possible causes— etastatic deposits, blocked bronchi, and unusual rimary foci—he had seen lesions which corroborated e last two. but observation had not convinced him at hæmatogenous metastasis was a valid explanation.

The terms "endogenous" and "exogenous" should, e suggested. disappear. Along with the changing inci- ence of the disease and the age of onset, the pathological icture also appeared to be altering. At least five types f lesion could be identified: (1) the childhood primary ocus which heals; (2) the childhood focus which moulders until cavity formation in later life; (3) the hildhood lesion which progresses to bronchopneumonia nd death: (4) the primary focus in a previously tuber- ulin-negative adult; and (5) the healed childhood lesion with adult reinfection of primary type, the latter either also healing or progressing to destructive disease.

Dr. A. Margaret Macpherson (London) described a follow-up of 729 children (over 600 for five or more years), of whom only 7 had developed adult pulmonary tuberculosis. She had been impressed by the number of adolescents with early adult infection, with either a calcified primary lesion or a recent primary focus. Characteristically these patients had no constitutional disturbance, a normal B.S.R. and weight, and a negative family history; glandular enlargement seldom occurred with the lesion, which was in the upper third of the lung and tended to develop into typical pulmonary tuberculosis.

Dr. Walter Pagel (Middlesex) decried the importance of exogenous infection. There were two main types of phthisis, following either (1) immediately after the primary complex, or (2) after an interval. His series suggested that the former accounted for about 25% of cases. On the other hand, he felt that small post-primary foci did not sterilise themselves as easily as the lesions of the primary complex.

Prof. W. H. Tytler (Wales) said that the question would be clarified by large-scale statistical studies; exhaustive pathological investigation restricted the number of cases that could be tackled. The frequency with which primary infection was delayed till young adult life was increasing, but varied in different countries. It appeared that at the Phipps Institute many tuberculin-positives became negative, provided that their original infection had resulted from "no known contact." Did such persons who had lost allergy retain some immunity?

Dr. Ustvedt replied that morbid anatomy was not the most reliable line of approach. The problem of the negative reactor was important, but undoubtedly allergy could be separated from immunity. The form of tuberculosis varied in different countries; in Britain the frequency of calcareous shadows was an impressive feature.

ASSOCIATION OF CLINICAL PATHOLOGISTS

The association's summer meeting at Oxford on July 26 and 27, under the chairmanship of Dr. S. C. Dyke and Dr. A. H. T. Robb-Smith, was opened by Dr. R. Winston Evans (Manchester) with a paper on *Observations on Sickle-cell Anæmia* based on experience in West Africa. Sternal marrow from 20 cases showed that specific changes were not present in the early cells and only occasionally in reticulocytes and normoblasts—i.e., sickling only took place with ease after loss of the nucleus. Sealed, moist preparations typically showed expansion, tenseness, and filamentous extensions 6–8 hours before sickling, and then an explosive onset. Among 600 fit soldiers subjected to routine testing there had been an overall incidence of 19·9%, with the highest—30%—in the Gambians. The clinical findings varied, and might include leg ulceration, which suggested that the sickling was really not the primary lesion but merely superadded to other diseases. Discussion showed general agreement that oxidation-reduction was the important factor. producing sickling in 10–15 minutes, whereas alteration in pH alone had no influence.

Dr. E. Jacobsen (Copenhagen), discussing *Reticulocytes and their Humoral Regulation*, said that if reticulocytes were kept in saline at 40° C there was no drop in their number in 6 hours, whereas when liver was added the reticulocytes ripened very quickly. The liver principle he divided into two parts—a thermolabile fraction absorbed by florodin, and a thermostable fraction not absorbed. The thermolabile portion was a xanthine, of which folic acid was probably a part; stomach tissue also contained a good deal of the thermolabile fraction. Organs of different animals had different amounts of ripening substance, those with few reticulocytes having the highest ripening value while those with many reticulocytes had a low value. He suggested that increased reticulocytosis might therefore not necessarily mean an increased output from the bone-marrow, but might indicate a decrease in the ripening factor.

Dr. S. Wray (Harrogate), in a paper on *Acid Phosphatase* based on 25 cases of prostatic carcinoma, explained the method of estimation and its increase in prostatic carcinoma; it was probable that maintenance doses of administration of a soluble barbiturate. In cases of barbiturate poisoning very large doses of picrotoxin have been administered with success. Kohn et al. (1938) report recovery after 671 mg. of picrotoxin had been administered in four days, and Richards and Menaker (1942) mention recovery after 1944 mg. The largest amount given appears to be 2134 mg. (Rovenstine 1938).

CASE-RECORD

A woman, aged 24, was admitted to hospital at 12.30 A.M. on April 6, 1945, completely unconscious and breathing stertorously. The pupils were of normal size, all the reflexes were absent, and the patient was flaccid. Her mother believed that the patient had taken about 50 pink tablets some $5^1/_2$ hours previously. The patient was last seen going to her room at 7 P.M. and was found at 7.30 P.M. lying unconscious on the floor. Part of a tablet was brought to hospital. It was presumed to be 'Soneryl' and this was later confirmed. Each tablet contained gr. $1^1/_2$ of soneryl. The patient worked as a packer at a nearby drug-manufacturing firm.

A stomach washout was immediately performed, but the fluid returned was clear. Picrotoxin 10 mg. was injected intravenously at once, but with no effect. A large amount of an aqueous solution of picrotoxin was then made up, and about 2 hours after admission intramuscular injections of 5 mg. doses were started. These were continued at 15-minute intervals throughout the days of the 6th, 7th, 8th, and 9th, except for a few short lapses of 2 hours each on the 8th and 9th. Fresh amounts of picrotoxin solution were prepared daily.

At 11.15 P.M. on the 9th the patient became restless and showed signs of returning consciousness. The picrotoxin was therefore discontinued. She relapsed, however, into unconsciousness, and the drug was started again 3 hours later. It was finally discontinued at 5.15 A.M. on the 10th, when she had definitely regained consciousness.

During her unconscious period she was fed nasally with small glucose feeds. The head of the bed was raised. She became febrile and chesty on the 8th. She was therefore put on sulphathiazole in full pneumonia doses, but this had little effect on the temperature, so it was discontinued after 3 days. On her return to consciousness she was found to have a right lower lobar pneumonia. This developed into an empyema. Rib-resection was performed, the empyema cleared up, and the right lung expanded fully. She then developed a left-sided empyema, for which she also had a rib-resection. The patient was discharged from hospital on Sept. 7, 1945, but continued to attend the outpatient department for dressings. She was finally discharged on Feb. 15, 1946. Radiography on that date showed clear lung fields.

She had confessed to taking 100 tablets—i.e., gr. 150—of soneryl on the night of her admission to hospital.

COMMENTS

This patient was unconscious for $4^1/_2$ days, during which time 1745 mg. of picrotoxin was administered by intramuscular injections, except the first dose, which was given intravenously. She appeared to tolerate the drug well, and it did not seem to have any adverse side-effects.

The development of the right-sided pneumonia must have been a consequence of her long period of unconsciousness. The left-sided pneumonia followed the operation for the first rib-resection.

Lumbar puncture with withdrawal of cerebrospinal fluid was not done deliberately, because I wanted to gauge fully the effectiveness of picrotoxin.

POSTSCRIPT

Since the above report was written, I have had to treat another case of gross barbiturate poisoning.

A woman, aged 38, was admitted unconscious to hospital at approximately 2 P.M. on June 17, 1946. The history suggested an overdose of 'Luminal' (phenobarbitone), and she afterwards confessed to having taken 40 luminal tablets, 18 soneryl tablets, and 4 'Nembutal' capsules at about 10 P.M. on the previous night. She had therefore been unconscious for at least 14 hours before admission.

She was deeply comatose and flaccid, and all reflexes were absent, including the pupillary light reflex and the corneal reflex. She was given three ampoules of nikethamide (1·25 g.) intramuscularly and later 10 mg. of picrotoxin intravenously, but did not respond. Regular doses of picrotoxin—5 mg. every fifteen minutes, intramuscularly—were commenced at 4.15 P.M. on June 17 and continued until 5 P.M. on 20th except for short intervals when the patient to be regaining consciousness. On the evening of the she became very restless and was almost fully co All her reflexes were present. Picrotoxin was discontinued. By next day she was fully conscious and able to speak rationally. Nasal feeding was then stopped.

On June 19, while she was still unconscious, she be febrile and "chesty," with bilateral basal crepitations. was put on sulphapyridine in full pneumonia doses by muscular injection. She responded well to this and it stopped on the 25th. Radiography of the chest on the suggested slight consolidation at both bases but on July lung fields were clear. She was then discharged from ho

Throughout her period of unconsciousness she was with the head of the bed raised, and was fed by nasal t

In this case the patient was unconscious for 14 hours before treatment was started, and recei total of 1020 mg. picrotoxin in three days.

My thanks are due to Dr. E. Miles, medical superint for permission to publish these cases, and to Mr. R. E. Fri the hospital pharmacist, for his help in making up the la quantities of picrotoxin solution required.

REFERENCES

Duff, D. M., Dille, J. M. (1939) *J. Pharmacol.* 67, 353.
Kohn, R., Platt, S. S., Saltman, S. Y. (1938) *J. Amer. med. A* 111, 387.
Richards, R. K., Menaker, J. G. (1942) *Anesthesiology*, 3, 37.
Rovenstine, E. A. (1938) *Amer. J. med. Sci.* 196, 46.

Medical Societies

TUBERCULOSIS ASSOCIATION

On July 19, the second day of the association's Ox meeting, with Dr. **Norman Tattersall**, the presid in the chair, a discussion on the

Relationship between Primary and Adult Pulmonary Tuberculosis

was opened by Dr. **Hans Ustvedt** (Norway), who s that the divergent views on the subject were due to national variations in the epidemiological picture The dogma of universal childhood infection had killed by the agreement at the 1937 Lisbon confer that primary infection now occurred chiefly du puberty and early adult life. With good conditions observation it was found that about a third of prim infections were accompanied by demonstrable Differences between children and adults were not gr though there was a *malignant* type, primary infe often had a benign course. On the other hand, destru adult tuberculosis had had a characteristic max between the ages 15 and 30, though this was appar being levelled off throughout adult years. Tubercul dissociated from immediate primary infection origin (apart from the probably few cases of superinfect in reactivated latent foci or in "postprimary" stases from foci in lymph-glands or other organs. interval between primary and postprimary disease in most cases under 5 years, and was often only years. Scandinavian figures, using erythema nod as an index of the start of infection, showed that morbidity curve of serious disease had a high peak in first five years, and especially in the first year. Pleur most often appeared within six months, and there a large concentration of disease in the years immedi following the pleurisy. Norwegian statistics also sho that the steep rise in the morbidity and mortality cur nearly synchronised with the age-group at which number of new infections was greatest and the five- period thereafter.

Theoretically, destructive pulmonary tubercul could develop directly from the primary focus or immediate neighbourhood by breakdown, or it co start from a new focus in another part of the lu Outside Norway much emphasis had been placed the latter method; Radeker's "Frühinfiltrat," wh was usually subclavicular, was not compatible the theories of development from tiny apical and his claim that it was due to superinfection not buttressed by adequate tuberculin testing,

Vitamins in diseases of the mouth

Unhealthy oral conditions may result from dietary deficiencies. Appropriate correction of such deficiencies at an early stage may prevent the development of more serious conditions.

VITAMIN A deficiency

This may cause hyperkeratosis of the gums as well as over-growth of epithelia elsewhere. It causes hypoplasia of the enamel organ in experimental animals and there is evidence that vitamin E deficiency has a somewhat similar effect.

VITAMIN D deficiency

This affects the developing enamel, dentine and alveolar bone. Calcium deficiency aggravates its effects.

VITAMIN B_1 deficiency

Small herpetiform vesicles may appear under the tongue or on the palate. They clear up quickly on vitamin B_1 treatment.

RIBOFLAVIN deficiency

This produces cheilosis and a magenta-coloured glossitis, unaccompanied by gingivitis (unless this arises from other causes).

NICOTINIC ACID deficiency

The specific glossitis is fiery red and painful. Gingivitis characteristically accompanies it (contrast riboflavin deficiency) also generalised symptoms — weakness, lassitude, insomnia, headache.

ASCORBIC ACID deficiency

Hyperæmia occurs with swelling of the interdental and marginal regions of the gums which are tender and bleed easily. The gingivitis though not directly due to the deficiency usually responds to ascorbic acid administration.

Further particulars of the various vitamin products available for the above conditions are obtainable on request from:

VITAMINS LIMITED

(Dept. L.X.G.), Upper Mall, London, W.6.

FERTILOL

(Vitamin E and all the other factors of Wheat Germ Oil)

Used in the treatment of habitual abortion, sterility of dietary origin and certain neuro-muscular degenerations.

Fertilol is a highly active natural and stable source of vitamin E and of the other factors of wheat germ oil. Each 5 minim capsule is standardised to contain 3 mg. *a*-tocopherol.

> *Wheat germ oil has, in some trials,[1] shown properties additional to those of pure a-tocopherol.*
>
> [1] Vogt-Moller, P., Tier. Rund., 1942, 48.

Further particulars from Vitamins Limited, (Dept. L.F.I.), Upper Mall, London, W.6.

Preventing complications of childbirth

Experience shows that pregnancy and labour present fewer untoward incidents when the expectant mother increases her consumption of milk, fresh fruit, salad, vegetables and vitamin B-containing foods, supplemented by vitamins A and D.

In cases where such a protective regime presents difficulties, a multiple supplement is the best safeguard. A course of Pregnavite raises the intake of important vitamins and minerals to the high level required in pregnancy.

★Pregnavite

in recommended doses supplies:—

★

Vitamin A ..	4,000 i.u.	Calcium ..	160 mg.
Vitamin B_1 ..	0.60 mg.	Iron	68 mg.
Vitamin C ..	20.0 mg.	Iodine	Not less than 10 p.p.m.
Vitamin D ..	300 i.u.	Manganese	
Vitamin E ..	1 mg.	Copper	
Nicotinamide..	25 mg.		

Further particulars concerning Pregnative Tablets from Vitamins Ltd. (Dept. L.P.X.), Upper Mall, W.6.

œstrogens would be necessary for the rest of the patient's life.

In a discussion on the *Reliability of Clinical Hæmoglobinometry* Dr. R. G. MACFARLANE (Oxford) showed how in a series of investigations a 20% difference between two examiners had occurred. Eight men and eight women had been chosen—four trained and four untrained men and the same in the women. Heparinised blood was tested by sixteen methods on sixteen samples by sixteen observers. The results showed no real agreement between the different methods and the base line of the National Physical Laboratory, in which iron is estimated by King's method. The conclusions on the significant errors were that differences of 4% were significant with any one observer and 5% with any two observers. Dr. I. D. P. WOOTTON (London) showed that colorimetric methods agreed more closely with iron estimations than did gas analysis; it was suggested that grey wedges should be used, calibrated directly in grammes of hæmoglobin. Dr. MACFARLANE suggested that the original N.P.L. standard of 13·8 g. per cent. was too low and 14·7 g. per cent. should be accepted as the standard hæmoglobin.

Dr. JANET VAUGHAN (Oxford) spoke on the *Inci* *of Homologous Serum Jaundice after Transfusion* observations at the North-west London Transf Depot. Of 2040 patients followed up five months transfusion, only 1084 could be included in the se of these, 77 (7·3%) had developed jaundice. In a trol group no cases of jaundice occurred. The incuba period after transfusion was 50–150 days, with majority between 60 and 100 days. All cases were in contrast to other centres, where several deaths been reported. Fewer cases followed whole-blood tr fusion than plasma or serum, probably because thi pooled. Serum for prophylactic purposes should be pooled, and for transfusion only the smallest should be used; *and all blood products should* an identification number, so that records could easily checked.

Reviews of Books

Control of Pain in Childbirth

(2nd ed.) CLIFFORD B. LULL, M.D., F.A.C.S., clinical professor of obstetrics, Jefferson Medical College; ROBERT A. HINGSON, M.D., surgeon U.S. Public Health Service, director, postgraduate medical course, Philadelphia lying-in unit, Pennsylvania. London: W. Heinemann. Pp. 348. 42*s*.

THIS book could be read with advantage by every obstetrician in this country, and by every anæsthetist who attends obstetric cases. All practitioners who do midwifery would find it helpful. We are a long way behind the United States in obstetric analgesia and anæsthesia, and Professor Lull and Dr. Hingson stimulate us to improve our own well-tried techniques, if not to expand the scope of our obstetric analgesia. They have written a good and comprehensive section on anatomy and physiology, and they review and assess all known methods of anæsthesia and analgesia, using clear and attractive diagrams to illustrate the action of each drug on the various systems. They have a proper bias towards local and caudal anæsthesia, and put in a strong plea for the use of continuous spinal anæsthesia. These methods have much to recommend them; but British obstetricians have never liked them and so get disappointing results. Let them read this book carefully and try again. There are good chapters on analgesia in domiciliary midwifery, neonatal resuscitation, and anæsthesia in cæsarean section. We have no comparable volume by British authors.

A Handbook of Social Psychology

KIMBALL YOUNG, professor of sociology, Queen's College, New York. London: Kegan Paul, Trench, Trubner. Pp. 578. 21*s*.

NOBODY questions the importance of social psychology, but many doubt whether it yet has independent scientific status. Prof. Kimball Young's exposition partly answers such doubts, but contains too much discussion and too little experiment to allay them wholly. In a field which touches daily life so closely, a textbook must do more than state, examine, illustrate, and organise matter which is within everyone's knowledge; and the well-informed reader will require that it should enable him to correct his erroneous beliefs, and to enlarge the stock of facts and generalisations through which he can predict the outcome of known circumstances. This the book does insufficiently, in spite of the author's wide range, critical erudition, and lucid grasp. There are three main divisions: the first deals with basic relations of personality to society and culture, the second with human conflict, and the third with mass behaviour. In the first there are chapters on animal behaviour, drives and emotions, factors in learning, the mechanism of personality, stereotypes, myths and ideologies, and dominance and leadership. Prejudice, revolution, war, and morale are expounded in the section on human conflict; problems of crowd behaviour, fashion, public opinion, propaganda, and power make up the final division of the book.

Cardiovascular Disease in General Practice

(2nd ed.) TERENCE EAST, D.M. Oxfd, F.R.C.P., physic in-charge of cardiological department, King's Col Hospital, London. London: H. K. Lewis. Pp. 198. 12*s*.

UNLIKE most of his fellow authors, Dr. East h succeeded in bringing out a new edition of his bo which is actually shorter than the original. This typical of his approach to his subject: he restricts hi self to aspects of cardiology important to the m in practice. No unnecessary words are used; ind at times the style is almost telegraphic. The teachi is essentially sound, though many will deprecate t choice of cæsarean section for delivery of the mot with heart-failure. Pruning of the section on anæ and heart disease would have left room for fuller exp tion of the important subject of heart disease in old

Howell's Textbook of Physiology

(15th ed.) Editor: JOHN F. FULTON, M.D., Sterling fessor of physiology, Yale University. London: W. Saunders. Pp. 1304. 40*s*.

THE editor of this edition of the well-known originated by Howell has delegated many sectio different writers. In the main, it is a sound exposi of the subject with a strong physical bias; thus, th are good chapters on hæmodynamics, and on mus nerve physiology and electrical changes in the The nervous system is also unusually well treated. the section on the circulation is full of fundame information. Many students will feel the book is w having for these sections, which occupy more than thirds of it. The remainder is also good, but respira metabolism, nutrition, excretion, and reproduction not dealt with in the same detail, and there is no sep section for the endocrine organs. When as many pages are allotted to the electrocardiogram and interpretations, this seems parsimonious. In spite of criticisms, which are chiefly of imbalance—a d almost inseparable from multiple authorship—the reaches the status of a standard work.

Experiments with Mammalian Sarcoma Extract

in regard to cell-free transmission and induced immunity. CARL KREBS, OSKAR THORDAR JOHANNES HARBO, from the Aarhus Kommune Hosp Röntgen and Lysklinik. Translated by Robert Fr Pp. 96.

THESE further studies of the Krebs, Rask-Niel Wagner sarcoma were undertaken to find out if tumour is produced by a virus and is capable of cell transmission, and also in an attempt to increase resistance of mice against inoculation with tumour Neither object has so far been attained, but the valu this work lies in the detailed description of the procedu adopted. Cell-free transmission of mammalian sarco has on occasion been successful, but never repeatable will. It seems therefore that the crucial factor has some neglected trifle or totally unsuspected conditi These authors record one experiment only in wh cell-free transmission may have occurred. They conclu that they have no evidence to support the hypothe that mouse leukosis is caused by a virus.

THE LANCET

LONDON: SATURDAY, SEPT. 14, 1946

B.C.G.: the Next Phase

y his social experience through the centuries, opean man has acquired a fair resistance to rculosis; but until the introduction of B.C.G. ine the bacteriologist had failed to add one cubit ts stature. From the "brownish-clear fluid which lurable in and for itself," which Koch called rculin, to the bacillus which Calmette and rin isolated from "lait du Nocard," the tale of e vaccines is a long one, and it is written in the books for those to read who wish. But most of se vaccines belong to the past; they are dead, h metaphorically and literally, excepting only .G.

ntroduced by Calmette shortly after the first rld war as a means of protecting children born tuberculous households in Paris, B.C.G. vaccine passed through several critical phases. Oral ministration, which was first employed, was too phazard and came to a dramatic end under the probrium of the Lübeck affair, for which it was in fact responsible. Subcutaneous and intra- taneous inoculations followed, but caused many abscesses at the site of inoculation. Quite recently .G. has successfully negotiated the trial of two transcutaneous methods—a scarification and a ltiple-puncture technique. As to its real efficacy, ny international discussions have raised the tem- rature amongst the critics, and no useful purpose uld be served at this late stage by going over all e arguments which concerned the experts in the alth Organisation of the League of Nations. Four ts, however, stand out from the mass of official ports and protocols of experiments: (1) the Cal- ette-Guérin bacillus is harmless to man; (2) culation with it increases resistance to tubercu- sis; (3) the degree and duration of this immunity ve not yet been precisely determined; but (4), like e immunity conferred by other bacterial vaccines, is not permanent.

An impressive array of information collected from rious parts of the world has recently been set forth the European regional office of Unrra[1] and in a morandum, prepared by Prof. W. H. Tytler,[2] ich has been presented to health departments ntly by various tuberculosis organisations.[3] These dies have made it clear that informed opinion is w in favour of a clinical trial of B.C.G. in this untry, and they also advocate a single source of pply under official control. Because of the earlier cteriological reports on the unstable virulence of e bacillus, and because of the Lübeck incident, ess has rightly been laid on the care with which e vaccine should be prepared by the laboratories. When a vaccine is made of living micro-organisms, almost as much concern, however, should be felt about its care when it is no longer under the watchful eye of the bacteriologist who has prepared it.

The subcutaneous and transcutaneous methods of giving B.C.G. have been pioneered chiefly in Scandinavia. The Norwegians began with tuberculin-negative nurses and then went on to immunise groups of the general population. Later B.C.G. was introduced for the Norwegian forces in Britain, and between 3500 and 4000 were inoculated. This group deserves special mention because it is the only large body of persons immunised while living in this country; but so far as we know the results have not yet been published. It has been claimed that the vaccine "gives a standardised innocuous primary infection," but the Unrra bulletin emphasises what is regarded as a contra-indication to its use—namely, a latent allergy in the individual. It points out that

> "In Scandinavia nurses undergoing B.C.G. vaccination are completely segregated; there is an ante-vaccinal period of isolation, during which all the requisite preliminary investigations are made, viz., tuberculin testing, radiography, ascertainment of home conditions to eliminate the possibility of recent infection. Thereafter the vaccination is carried out and, one month later, the individual is tuberculin tested. Should the reaction prove negative, the individual is segregated for another month and again tuberculin tested."

If these difficulties have been overcome in Norway, there is no reason why they should not be tackled here, but with the present shortage of staff they will not be easily surmounted. The memorandum presented to the health departments advocates a trial—purely voluntary—with selected groups of people who are exposed to unusual risks of tuberculous infection. Those who work in hospital—medical students, nurses, and domestics—come to mind at once; and these groups certainly lend themselves to medical supervision, though not all their members are employed very long in one place. In the industries with a high incidence of tuberculosis it might be less easy to arrange appropriate trials; while children in tuberculous households in this country do not in general run such serious risks as they did in Paris when the vaccine was introduced. The primary object of an inquiry should be to determine whether B.C.G. vaccine will give in Britain the satisfactory results claimed for it in Scandinavia, in Canada, and in some other parts of the world. It should be borne in mind that tests on a small scale in New York, where the conditions more closely resemble those of the large British cities, have not been strikingly favourable: moreover, the clinical picture of tuberculosis varies in different countries, racial resistance differs, and neither social circumstances nor anti-tuberculosis measures are the same. Granted therefore that the vaccine is efficacious, it will not necessarily produce dramatic results in this country where infection is already under fair control, and where spontaneous arrest of the disease is very common: it is more likely to do conspicuous good in the devastated and hungry parts of Europe where ordinary precautions have broken down and cannot be restored for a long time; or in the tropics. There are some, indeed, who consider it mere wishful thinking to suppose that prophylactic vaccination will hasten

---

Bulletin of Communicable Diseases and Medical Notes, 1946, 4, 705.

Memorandum on B.C.G. prepared for Tuberculosis Association, Joint Tuberculosis Council, and National Association for the Prevention of Tuberculosis, 1946; see *Lancet*, July 27, p. 138.

See *Lancet*, July 27, p. 125.

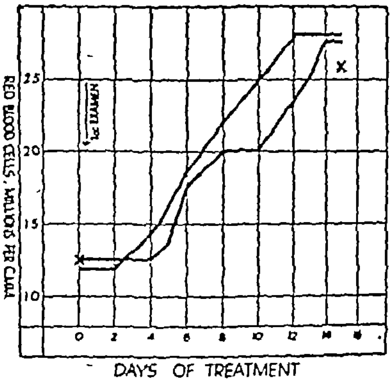
On 1 cc.

The two test cases are typical of many, and fully demonstrate the efficiency of 'Examen.'

Every batch of 'Examen' fulfils in test the criterion of optimum response for one single injection of 1 cc. over 14 days.

This chart shows the required response to treatment for an initial red-cell level of 1.25 million. According to this criterion the final red-cell level must be at least 2.6 million (the crosses indicate the initial and final red-cell levels). The responses obtained in two test cases using 1 cc. of 'Examen' are shown by the continuous lines.

Thus 1 cc. every 14 days is the standard dose in treatment, and 1 cc. every 4 weeks the dose in maintenance.



*Lancet (1942) 2, 275. Brit. med. J. (1945) 1, 75.

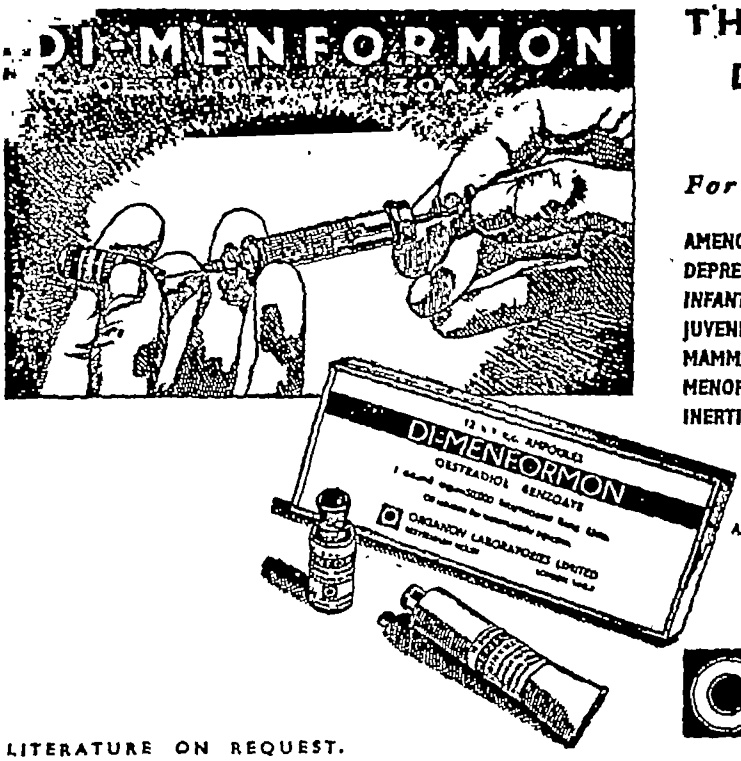
PRODUCT OF THE GLAXO LABORATORIES

EXAMEN

Injectable liver extract

1 cc. boxes of 3 and 6: 5 cc. boxes of 1 and 5.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434



THE DEPENDABLE OESTROGEN

For injection or inunction

AMENORRHŒA · CLIMACTERIC SYNDROME AND DEPRESSION · DYSMENORRHŒA · ENDOMETRITIS INFANTILISM · INHIBITION OF LACTATION JUVENILE MENORRHAGIA . KRAUROSIS VULVAE MAMMARY UNDERDEVELOPMENT · MASTOPATHIA MENOPAUSAL ARTHRITIS · PRIMARY UTERINE INERTIA · STERILITY · UTERINE AND TUBAL HYPOPLASIA

AMPOULES AND VIALS 10,000 AND 50,000 I.B.U./CC.
OINTMENT 20,000 I.B.U./GM.

LITERATURE ON REQUEST.

ORGANON
BRETTENHAM HOUSE, LONDON, W.C.2

TELEPHONE: TEMPLE BAR 6785 *TELEGRAMS: MENFORMON, RAND, LONDON* mediate case-mortality of 38%, and 19 one-stage erations with a mortality of 31%, 22 of the opera- ns being for carcinoma and all deaths occurring this group. Cattell,[9] who favours a two-stage chnique for jaundiced patients, has reported 13 o-stage and 5 one-stage operations with 3 immediate aths—an overall mortality of 17%. It is too early assess the remote results, but, as might be expected, tients with growths of the ampulla seem to do tter than those with growths of the pancreatic head. t least these figures falsify the physician's ancient be that the only effect of surgery in pancreatic rcinoma is to let the patient die a better colour.

It would be idle to pretend that American experience these operations is not greater than ours, but only a erverse and foolish modesty would ignore the work of ritish surgeons. Illingworth,[10] Gordon-Taylor,[11] aingot,[12] and Watson[13] have between them recorded cases with 2 deaths, all the successes being with the o-stage operation. This year d'Offay,[14] in a itherto unpublished address to the Royal Society Medicine, described what appears to be the first ccessful one-stage radical operation in this country, s well as 2 other cases, one of whom died. d'Offay mphasises the accuracy of Courvoisier's law in he differential diagnosis of carcinoma and stone, rovided that the law is applied after actual inspection f the gall-bladder through a peritoneoscope rather han by abdominal palpation. Pannett[15] has lso reported 2 successful one-stage operations. he history of the radical operation for pancreatic arcinoma shows that bold thinking has once more onfounded those who contend that surgical technique as reached its zenith.

Efficacy of the Penicillins

It has been known for some time[16] that there are everal chemically different penicillins whose strucures have a common nucleus, but differ in the nature f a side-chain R. So far five different penicillins have een isolated in the crystalline state from culture nedia of moulds. Four of these, which have been tudied in greater detail than the fifth, are now called enicillins F, G, X, and K in the United States, vhereas in Britain they are known as penicillins I, I, III, and IV, according to the historical sequence f their discovery; it is hoped that this confusing omenclature will soon be replaced by a more conruous chemical terminology. The side-chains R of he different penicillins have the following chemical tructures:

For penicillin I (F) C_5H_9 (2-pentenyl)
" " II (G) $C_6H_5CH_2$ (benzyl)
" " III (X) $OH . C_6H_4 . CH_2$ (*p*-hydroxybenzyl)
" " IV (K) C_8H_{17} (*n*-heptyl)

The four different penicillins affect the same range f bacteria, but differ quantitatively in their antiacterial power in vitro. Thus, if we assign a value of 00 to the antibacterial activity in vitro of penicillin I (G), the relative values for penicillins I (F), II (G), II (X), and IV (K) are 90, 100, 55, and 140 against the strain of *Staphylococcus aureus* used for routine assays of penicillin (in international units per mg. the figures are 1550, 1667, 900, and 2300); against a strain of hæmolytic streptococcus the values are 82, 100, 140, and 120, and against a cultured strain of *Spirochæta pallida* Reiter 53, 100, 50, and 75.[17] The chemotherapeutic efficacy of the penicillins, however, like that of all other chemotherapeutic agents, depends not only on their activity in vitro but on a series of other factors, such as absorption, excretion, destruction in the body, &c. It is therefore not possible to predict their effectiveness in vivo solely on the basis of the figures for their antibacterial activity in vitro. Recent evidence shows that penicillin IV (K), notwithstanding its high antibacterial action in vitro, is much less efficacious in vivo than penicillin II (G). Thus, in the treatment of *Streptococcus pyogenes* infections in mice, penicillin IV (K) was only 1/11th as effective as penicillin II (G) and only 1/30th as effective as penicillin III (X), and in the treatment of pneumococcus type I infections in mice penicillin IV (K) was only about 1/6th as effective as penicillin II (G) and 1/8th as effective as penicillin III (X).[17] Similar results were obtained in the treatment of experimental syphilis in rabbits. Here various independent investigators[18] found penicillin IV (K) to be only about 1/10th as effective as penicillin II (G). The explanation seems to be that penicillin IV (K) is subject to greater destruction in the body than the other penicillins. This conclusion must be drawn from the fact that after intravenous or intramuscular injection the blood-levels with penicillin IV (K) drop more rapidly than with the other penicillins, while the proportion of the injected penicillin that is recoverable from the urine is much lower with IV (K) than with the other penicillins,[17, 19] the figures being about 30% and 80%.

The finding that penicillin IV (K) is less efficacious chemotherapeutically than the other penicillins is of considerable practical importance since commercial penicillin is a mixture of different penicillins with an undefined proportion of penicillin IV (K). The amounts of the different penicillins in the commercial products depend on the strain of mould used in production and on the composition of the culture medium. Strains used by manufacturers up to 1944 yielded predominantly penicillin II (G), but since 1944 a change has taken place in the commercial penicillin preparations, leading to a fall in their content of II (G) and a rise in IV (K). Strain Q176, which is now used by most penicillin manufacturers because it gives the highest penicillin yield, is known to produce under certain conditions a considerable proportion of IV (K). A statistical comparison has shown that the results of treatment in early syphilis with penicillin preparations manufactured before 1944 were decidedly better than those obtained with penicillin manufactured in 1944–46. There may be other causes for this than simply a change in the proportion of penicillin IV (K). Since 1944 the purity of the commercial penicillin preparations has increased considerably. Dunham and Rake[20] have produced evidence to show that

---

9. Cattell, R. B. *New Engl. J. med.* 1945, 232, 521.
0. Illingworth, C. F. W. *Edinb. med. J.* 1939, 46, 331.
1. Gordon-Taylor, G. *Brit. med. J.* 1942, ii, 119.
2. Maingot, R. *Lancet*, 1941, ii, 798.
3. Watson, K. *Brit. J. Surg.* 1944, 31, 368.
4. d'Offay, T. M. J. Address to Royal Society of Medicine, April 3, 1946.
5. Pannett, C. A. *Brit. J. Surg.* 1946, 34, 84.
6. See Leading Article, *Lancet*, 1946, i, 539.

17. Eagle, H., Musselman, A. *Science*, 1946, 103, 618.
18. Committee on Medical Research, the U.S. Public Health Service, and the Food and Drug Administration. *J. Amer. med. Ass.* 1946, 131, 271.
19. Coghill, R. D., Osterberg, A. E., Hazel, G. R. *Science*, 1946, 103, 709.
20. Dunham, W. B., Rake, G. *Amer. J. Syph.* 1945, 29, 214.

the slow disappearance of tuberculosis from our midst, and even fear that it may deflect us from more fundamental efforts at eradication. As Prof. Arnold Rich *has pointed out*, however, a disease which still kills twice as many individuals as any other during the productive period of life cannot be regarded as nearly defeated. There is as yet no easy way to victory over so inveterate an enemy, but it is not too much to hope that immunisation, if wisely handled, will prove a useful weapon.

The clinical trial of B.C.G. which we hope soon to see in this country should be placed in the hands of *a body such as the Medical Research Council* which has the experience, equipment, and personnel for work on a sufficient scale. Only the most carefully compiled figures in significant quantity will satisfy the statisticians. The question also arises whether it should be confined to B.C.G. The vole bacillus discovered by A. Q. Wells shortly before the war[4] *is running the Calmette-Guérin organism very close*, and Birkhaug's latest experiments suggest that in animals its immunising properties are as high.[5]

Excision of the Head of the Pancreas

Hopes of a radical treatment for carcinoma of the pancreas were first raised in 1899 when Halsted excised a segment of the duodenum and part of the pancreas for an ampullary growth; but progress was sporadic until, in 1935, Whipple, Parsons, and Mullins[6] initiated a systematic study. Since then reports of excision of the duodenum and pancreatic head for carcinoma have become almost commonplace in America.

Apart from the rare islet-cell tumour, malignant *growths of the head of the pancreas may be classified* according to their site in two main varieties: carcinoma of the ampulla of Vater or its immediate tributaries grows slowly and gives rise to early jaundice, whereas carcinoma of the head of the pancreas proper is more common, more malignant, and gives rise to jaundice somewhat later. A radical resection of either type necessitates removal not only of the pancreatic head but also of the duodenum, because the lymphatic and blood supplies of the two organs are inseparable. So bold an extirpation (involving as it does the division and repair of the intestinal, biliary, and pancreatic tracts) would scarcely be possible without the recent advances in chemotherapy, the discovery of vitamin K, and the excellence of resuscitative and anæsthetic techniques. The problems of the actual excision are anatomical and are largely concerned with avoiding damage to blood-vessels essential to life. The repair *which follows has its special difficulties. The thorniest* is the treatment of the pancreatic stump; this continues to secrete the most powerful proteolytic enzyme in the body, and mere closure of the cut end has led, through sloughing and digestion of damaged tissues and sutures, to external fistulæ and—still worse—to internal leaking. What remains of the pancreas must therefore be anastomosed to the jejunum, into which it can secrete. The new anastomoses of the biliary and pancreatic tract the intestine have no sphincters, and their ostia therefore be kept away from the main stream digesting food; unless this is contrived, by admi bile and pancreatic juice to the jejunum pro to the gastric opening, ascending cholangitis pancreatitis will result from reflux of food up respective channels and the proximal jejunum be denied the protection from the gastric provided by an alkaline flow from above. Op differs as to whether radical [illegible] should be done in one or two stages. The advo of the *one-stage operation argue that the d* risk of two operations is avoided, that [illegible] adhesions at the second and more difficult are sidestepped, and that the patients, though de jaundiced, can be carried safely through by suffic preparation, particularly with vitamin K. The t stage protagonists hold that these patients are *ill to stand a major procedure without preliminar* biliary decompression; they do not find [illegible] a problem at the second stage if the gall-bladd is anastomosed to the jejunum.

Whipple,[7] doyen of pancreatic surgeons a an advocate of the one-stage operation, has late distilled his wisdom in a formula for the operati *For an ampullary growth the abdomen* is through a right rectus incision from the costal mar to the umbilicus. After a general survey, the pe toneum is incised to the right of the duoden which is elevated to determine the mobility of pancreatic head, and the configuration of the unci process is studied. If the growth appears oper the common bile-duct is divided behind the duoden The stomach is transected proximal to the pylor and the origin of the gastroduodenal artery fro the hepatic artery revealed, ligated, and cut. duodenum is divided proximal to the duodenoje flexure (this stage must be modified if the unci process encircles the superior mesenteric vess and the *inferior pancreaticoduodenal* artery is secur The pancreas is cut across at the junction of head and the body, and the splenic vessels, p vein, and superior mesenteric vessels are dissec off, drawing the pancreatic head to the right. pylorus, duodenum, *lower end of common* bile-d and head of pancreas are now removed en A loop of jejunum is brought up and anastom to the stomach, pancreatic stump, and cut end of bile-duct, from below upwards, so that gastric opening is the most distal in the jejun It seems easier than might be supposed to insert small rubber tube into the pancreatic duct which dilated from obstruction, and to thrust the through a small hole into the lumen of the jejun the cut edge of pancreas is then sutured to the je wall. A drain is inserted and the abdomen clo Whipple attaches great importance to the use silk throughout the operation, because catgut readily digested by any escaping trypsin; and thinks that the gall-bladder should never be to anastomose the biliary tract to the intestin an unavoidable expedient in the two-stage operati

What are the results? Whipple in 1945[8] repor *that he had done 8 two-stage operations* with iile some obstetricians have hailed Read's work as ›neering service to obstetrics, others have decried a new flight of psychiatric fancy. His method has employed in the U.S.A. by Blackwell Sawyer,[2] personally delivered 168 women in a small general ital without the assistance of a resident. His material sted of 62 primiparæ and 106 multiparæ. He had tal death (a premature infant dying twelve hours delivery) and he used forceps 9 times—for occipito- :rior position and deep transverse arrest 4 times for a big head (low forceps) 5 times. He had 1 set wins, and 1 breech and 1 face presentation. In r words, his obstetrical material was fairly repre- ıtive. The women with malpresentations suffered most pain, but of the 106 multiparæ, 90 said that were helped greatly by the method, that they had no during the first stage, and that they concluded the nd stage in two to five expulsive efforts. They were ›ffered ether as an anæsthetic but only 4 accepted There was no hysteria or uncontrollable crying or ıming. They were prepared to go through their ur again, conducted in the same manner: some of women were astonished at the smoothness of their ery. Of the 62 primiparæ, apart from malpresenta- s and forceps for big heads there were 53 cases, of m 5 were frightened, groaning, and complaining ıen all through their delivery and were written off omplete failures. Among the remaining 48 little pain experienced. In 10 of these pethidine was used in s of 50–100 mg., one or at most two injections being n; this "took the edge off the pain" and enabled patients to coöperate. In all primiparæ the perineum injected with procaine and a small episiotomy ormed. Patients with whom the technique was :essful were calm and cheerful.

---

[4] Wells, A. Q. *Lancet*, 1937, i, 1221, 1333.
[5] Birkhaug, K. *Amer. Rev. Tuberc.* 1946, 53, 411; see *Lancet*, July 6, p. 17.
[6] Whipple, A. O., Parsons, W. B., Mullins, C. R. *Ann. Surg.* 1935, 102, 763.
[7] Whipple, A. O. *Surg. Gynec. Obstet.* 1945, 82, 623.
[8] Whipple, A. O. *Ann. Surg.* 1945, 121, 847.

ıwyer's conclusion is that the method when carefully lied is valuable in relieving the pain of normal dbirth in 90% of cases. The extent of relief varies, it is a positive phenomenon, complete in some and ial in others with whom the minimal use of analgesic gs as an adjuvant will have an added effect. The great wback to the method is that it is very time-consuming, there cannot be many obstetricians in this under- tored country who will have time to apply it properly. t is at least abundantly clear that fear should be ished from the expectant mother, and that if she has confidence in her attendants and the arrangements le for her confinement (and this confidence is the ural corollary of decent and efficient antenatal super- on) then she will have an easier, safer, and speedier our.

THE SICK FAMILY

OCIALLY troublesome families, such as a number of lical officers of health have been investigating in country,[3] were recognised in Holland to be a social blem during the period following the first world war. 1926 a compound or colony was created by the city ncil of Amsterdam on a peninsula between two canals the edge of the city. It consisted of 52 bungalows quately equipped and associated with a kinder- ten, clubroom, and other amenities. Social assistance supervision were arranged, and much effort was put › the scheme. But in the course of years it became lent that it had utterly failed to restore these families ı satisfactory independent way of life: "the village ame a collection of social curiosities and freaks; r the evacuation of the compound these families lived, live, in almost indescribable squalor in the poorer rters of the town." Dr. Arie Querido,[4] who has reported on the matter, draws the picture so familiar in every description of such families—dirt, disorder, fecklessness, neglect, and misery. "Whatever is the prevailing social problem, these families express it in its most acute form. In times of prosperity they are the parasites and petty criminals; when it is difficult to obtain work, they are the first and longest out of a job; when there is a shortage of houses, they are roofless; if there is a shortage of food, they are the first to go hungry."

Dr. Querido, in his capacity as director of the municipal department of mental hygiene in Amsterdam, was asked to look into this question because of the presumed importance of mental abnormality as a cause of the social failure. He was able to classify the families into three groups. In the first the social problem disappeared if certain adverse conditions of health and work could be remedied; the second group of families could never keep its head above water unless it had external help; but the third group was certain to fail no matter what social assistance was provided in the hope of remedying or averting its deterioration. Querido therefore came to regard the severe "social problem" family as a diseased biological unit, of which social deterioration was the chief symptom; he compares the measures that one takes to treat an individual patient who has mental disorder with those which are necessary for the disordered family, and finds them very similar. He is opposed to any such drastic solution as disrupting the family by withdrawal of the children: he compares it to killing a patient and then saying that the problem of his disease is solved. When he calls the social problem family a unit, he evidently means what he says.

To treat the family, two conditions, he insists, must be fulfilled—there must be means of treatment, and power to make these means effective. A committee which has considered the question has put before the Dutch government proposals to this end. A person who is apparently unable, by reason of mental disease or other mental failings, to fulfil his material and moral obligations towards himself and those who are dependent on him, can be placed under legal supervision by order of a judge. When one or both parents are thus dealt with, the supervisor (who is an expert in psychiatric or social work) establishes contact with the family, who must follow his instructions. He will be the guardian of their children, the parents being reduced to the legal status of minors. If attempts to improve the situation fail then the family can be placed, on the supervisor's recommendation, in an institution or camp for a period of a year (which can be prolonged by judicial decision). So far as the means of treatment are concerned, in the first instance the whole family would be placed in an observation camp where thorough psychiatric, medical, and social investigation would be carried out; thereafter the family would be placed in one of the "education camps," providing for about 15 families. While living in this camp the children would go to the ordinary school in the neighbourhood, and the members of the family would work in the ordinary farms and industries of the locality. Social assistance would be at hand for building up the household again. After a successful stay in the camp the family would return to its original locality, but would remain under supervision until the court brings it to an end.

These proposals are drastic and could only be warranted if the problem family presented as serious a menace to society as criminals or dangerous lunatics. Querido maintains that it does: "the course proposed involves a serious infringement of personal liberty and offers possibilities of abuse. On the other hand, the problem family offers serious dangers, is an infectional focus to society and presents an intolerable state of human indignity, so that strong measures are justified."

---

[2] awyer, B. *Amer. J. Obstet. Gynec.* 1946, 51, 852.
[3] avage, S. W. *Brit. med. J.* 1946, i, 86. Brockington, C. F. *Lancet*, 1946, i, 933. Wofinden, R. C. *Publ. Hlth, Lond.* 1944, 57, 136. Stallybrass, C. O. *Med. Offr*, 1946, 75, 89. Martin, A. E. *Publ. Administration*, 1944, 22, 105.
[4] uerido, A. *Med. Offr*, 1946, 75, 193.

impure penicillin preparations are more efficacious than crystalline preparations in the prophylaxis of experimental syphilis. It is conceivable—though by no means proved—that during the far-reaching purification of penicillin now carried out an impurity is removed which exerts a synergistic effect on the treponemicidal action of penicillin. In any case it is desirable to keep down the proportion of penicillin IV (K) in commercial preparations to a minimum. Fortunately it appears to be possible to influence the course of penicillin fermentation induced by the strain Q176 in favour of the production of penicillin II (G) by the addition of specific precursors. In future, producers will have to adopt more comprehensive methods of assay. The usual biological method of assaying penicillin preparations, based on their in-vitro activity against *Staph. aureus*, is, in conjunction with toxicity tests, the only criterion now commonly used for their clinical value. This will have to be supplemented by an analytical method which will reveal their quantitative content of the different penicillins.

Annotations

TWELVE-AND-SIX A HEAD

THE controversy between the Ministry of Health and the Insurance Acts Committee over the current N.H.I. capitation fee, on which we commented in our issue of August 3 (p. 166), has been carried some important steps farther. Despite repeated representations by the committee, the Minister has persisted in his view that the adjustment of the current capitation fee and the assessment of the proper mode and amount of remuneration in the new National Health Service are questions which interlock so closely that they cannot be considered separately. The committee, neither accepting this view nor being empowered to take any part in negotiations for the future service, found itself unable to meet the Minister for the discussions for which he asked, and, in default of negotiation, the Minister has now made his proposed award of an increase of 2*s.* in the capitation fee, to 12*s.* 6*d.*, with retrospective effect from Jan. 1, 1946. This he announced in the public press on August 24.

The Insurance Acts Committee met on Sept. 5 to reconsider its position, and it has decided that it can regard this award only as an interim payment and in no way as a final settlement of the long-standing claim of the panel doctor for higher remuneration. It reaffirms its view that the fee of 12*s.* 6*d.* is gravely inadequate, and regrets that the Minister is unwilling to implement now the report of the Spens Committee, whose findings it had been promised would be applicable to National Health Insurance "irrespective of the institution of any National Health Service." It believes further action should be taken, but before doing anything more it has decided to consult the panel committees, and through them the individual panel doctors. It has accordingly submitted the following recommendation for immediate consideration by the panel committees and their constituents, and for subsequent discussion at the Panel Conference due to be held late in October.

> That, in view of the Minister's failure properly to apply the report of the Spens Committee to the current capitation fee—despite explicit Government promises that this would be done—and in view of the grave inadequacy of 12*s.* 6*d.* as remuneration for assuming medical responsibility for an insured person for a year, it be recommended to all insurance practitioners in England and Wales, Scotland, and Northern Ireland to place their resignations from the National Health Insurance Service in the hands of the Insurance Acts Committee and to authorise that committee at its discretion to put in such resignations to insurance committees unless the Minister is willing fully to apply the Spens Report to the current capitation fee with effect at least from Jan. 1, 1946, or, failing agreement, to refer to the Spens Committee or a representative section of that committee or other agreed independent body the interpretation of the Spens Committee Report in relation to the current capitation fee, both parties agreeing in advance to accept the findings of such body.

There is much justice in the contention of the Insurance Acts Committee that the assessment of a just capitation fee for the present service could and should be separately undertaken now. The offer to submit to the judgment of "the Spens Committee or a representative section of the committee or other agreed independent body" is an offer free from intransigeance which makes an agreed settlement still attainable. But even if the Minister will not favourably consider any of these proposals, the frustration of this controversy must not be allowed to delay or obscure decisions which are even more important. Next month the National Health Bill may become law. As soon as it does, the Minister will be empowered to draft regulations of the gravest importance to the future of medicine. The British Medical Association has promised the doctors the opportunity of deciding by plebiscite whether the profession, through its negotiators, shall participate in the drafting of these regulations. The time remaining for the effective taking of this plebiscite grows short and must not be wasted.

PSYCHOGENIC PAIN IN LABOUR

IN the early nineteen-thirties Grantly Dick Read[1] postulated that the pains of labour are caused by fear and that the proper relaxation of the cervix is under the control of the autonomic system, which is connected with the thalamus—the seat of all primitive emotions and notably of fear. Corticothalamic impulses may inhibit the cervix via the sympathetic nerves and set up a state of primary uterine inertia. The uterus may be regarded as a hollow viscus with a detrusor and a sphincter muscle, and it may reasonably be supposed that the action of these two muscles, though primarily antagonistic, is in labour synergistic. The normal polarity between the sphincter and detrusor muscles may be disturbed by impulses from higher centres, and every obstetrician knows that a nervous woman having her first baby, surrounded by solicitous relatives, is a candidate for primary uterine inertia. Read therefore emphasises the importance of reassuring the expectant mother and of engendering such a confidence in her obstetrician, midwife, and institution that she faces labour with a mind calm and relaxed and a body in which the sympathetic nervous system has not got the upper hand of the parasympathetic. Having been instructed in the nature and function of labour she knows what sensations to expect, and does not panic when, for instance, the head distends the perineum. Many women so fortified and instructed can complete their labour without an anæsthetic or with only a minimal amount during the conclusion of the second stage. For such a technique of psychological anæsthesia to be effective the woman must be schooled from her first antenatal visit, and this, of course, demands time and patience on the part of her obstetrician. Read advises that she should be taught how to relax, and instructed to practise relaxation every day. The woman is also shown, by anatomical diagrams, exactly what happens in labour; discussion about the baby is encouraged and the woman's mind is focused on the child and away from herself. It is impressed on her that labour is a great event and a memorable occasion culminating in the lusty cry of a healthy child which it is her great feminine privilege to have borne.

---

1. Read, G. D. Natural Childbirth, London, 1933; *see also* Revelation of Childbirth, London, 1943.

ıe plankton, of which there are three groups— ucers, consumers, and reducers. The producers prise largely the chlorophyll-bearing diatoms and , which by solar energy build up organic matter ı inorganic nutrients in the water. The consumers ooplankton feed on the living or dead matter of this toplankton or its metabolic products, and are in turn sumed by such fish as herring, pilchards, sprats, kerel, and, curiously enough, one of the world's est mammals—the rorqual whale. Much of the ng or dead plankton falls to the sea floor, where it is en by the bottom fauna, including worms and shell- , which in their turn form the food of the bottom- ng fish. The amount of plankton is very large, being ecially rich in some Polar areas, but varies from one ion to another; it has been estimated that in the glish Channel alone the annual crop of phytoplankton ounts to 3600 tons per square mile. Suggestions that plankton might be used directly as human food re revived during the late war after a German report ıt the zooplankton had a nutritive value equal to ıt of the best meat, and the phytoplankton to that rye flour. Investigation showed, however, that ı probable yield from our seas did not warrant the ablishment of a special fishery.

The reducers, the sea's bacteria, are particularly portant to the marine life-cycle. As ZoBell has cently indicated,[1] only a very small part (0·1%) of e primary production of organic matter in the world's eans is removed each year in the form of fish, commer- al algæ, &c.; the remaining residues and waste products plants and animals undergo bacterial decomposition d return in mineralised forms to the sea and atmo- here, where they supply the phytoplankton with the ements, such as nitrogen, phosphorus, and carbon, om which its cell substance is synthesised. Without ıese bacteria the sea floor would soon be cluttered up ith a mass of dead plant and animal remains, and lant life, denied its essential elements, would cease. further important function of aquatic bacteria is the onversion of dissolved organic matter into particulate rganic matter (bacterial cell substance), which animals an utilise. ZoBell himself has found that, given suitable onditions, bacteria can mineralise roughly 70% of the rganic content of sea water and convert 30% into acterial cell substance or intermediate products. It is ebatable, as he points out, whether bacteria are suffi- iently abundant in sea water to constitute an appreciable em in the diet of marine animals, but cumulatively hey are clearly important to the food cycles of both nimals and plants.

A COMPASSIONATE RELEASE

IN July several newspapers reported the case of a oung officer of the Royal Army Medical Corps who vas released from the Service soon after the death of ıis father, with whom he was in partnership. The press eports made it appear that his release was the result of ressure by a Member of Parliament to whom 400 atients were said to have written; and the patients eemed to have been actuated by a belief that this doctor vas the only man who understood a method of treatment ractised by his late father. As may well be supposed, these newspaper reports have caused indignation, especially among those whose tenure of one-man practices did not prevent their acceptance for service during the war. We understand, however, that this officer was not in fact released on the ground that he is professionally indispensable at home: indeed, the local medical war committee, which judges such matters, decided that he was not. The War Office granted him compassionate release, obtainable in extreme cases of individual hardship of financial or domestic nature. Although there has been some relaxation since the end of the war in regard to one-man businesses (and practices) the number of Army medical officers granted compassionate release has been very small—less than 40 out of a total of over 8000 releases.

HOKEY-POKEY PENNY A LUMP

THE present outbreaks of enteric fever recall the profession's ancient quarrel with the uncontrolled sale of ice-cream. It is 67 years since a *Lancet* commission drew attention to the appallingly filthy conditions in which ice-cream was made in the Italian quarter of London.[1] Gone are the days of "penny a lump," but "hokey-pokey" (the Cockney's rendering of the Italian *ecco poco* or "here's a bit") and the outbreaks are still with us. In the interval ice-cream has been credited with ptomaine poisoning, carbolic-acid poisoning, zinc poisoning, and scarlet fever, as well as recurrent outbreaks of enteric. An outbreak of unspecified diarrhœa in Lancashire was traced to premises with "two vessels containing ice-cream in process of manufacture . . . within a yard of a pail-closet; and the fine strainer used for straining the milk and cornflour after boiling was within about four inches of a dolly tub in which were babies' napkins soiled with diarrhœal excreta."[2] Advances in bacteriology served to underline the extent of the scandal. Thus in 1894 the medical officer of health for Islington found in specimens of ice-cream "almost uncountable colonies of *Bact. coli*"[3]; and in 1897 the M.O.H. of Liverpool was impressed with "the marked similarity between plate cultivations of the ice-creams . . . and those of sewage."[4] Only fourteen years ago bacterial counts were found to range from 625,000 to 265,000,000 per c.cm.[5]

In the nineties some local authorities and the larger manufacturers were pressing for regulation of manufacture and distribution, but it was not until the enactment of the London County Council (General Powers) Act of 1902 that the first specific control was imposed. "It is difficult to believe that such categorical exposure of a foul danger to public health should not have been followed by reform until more than twenty years have passed."[6] In 1927 the Ice-Cream Association of Great Britain and Ireland invited the Minister of Health to propose a legal definition of ice-cream and to enforce the licensing by local authorities of all makers and vendors, whose premises should be inspected[7]; but no action was taken. Since then some authorities, and notably Hove, which provisionally adopted the same standard as for pasteurised milk,[8] have shown themselves increasingly alive to the risks. Last year a Ministry of Food order prohibited the admixture, except by licence, of dried eggs, since these may contain salmonella organisms; under the licence makers must pasteurise the mix within two hours of manufacture, and must observe certain other precautions. Otherwise, "it is only when conditions of manufacture are grossly insanitary that the Food and Drugs Act, 1938, is called in to protect the public."[9] Most of us will therefore agree wholeheartedly with the resolution passed by the conference of sanitary inspectors at Westminster on Sept. 5 calling for the compulsory registration of all ice-cream vendors. Until this step is taken no comprehensive plan of control is possible.

THE annual Harveian oration will be delivered at the Royal College of Physicians by Sir Maurice Cassidy on Friday, Oct. 18, at 3 P.M. His subject will be Coronary Disease.

---

[1] Marine Microbiology. Claude E. ZoBell, PH.D., associate professor of marine microbiology, Scripps Institute of Oceanography, University of California. Waltham, Mass.: Chronica Botanica Co. (in London from Wm. Dawson and Sons Ltd.). Pp. 240. $5.

---

1 *Lancet*, 1879, ii, 590. 2. *Ibid*, 1900, ii, 1149. 3. *Ibid*, 1894, ii, 862.
4. *Ibid*, 1897, ii, 1458. 5. *Ibid*, 1932, ii, 1230. 6. *Ibid*, 1902, ii, 998.
7. *Ibid*, 1927, ii, 896. 8. *Ibid*, 1938, ii, 1084. 9. *Ibid*, 1945, ii, 214.

WAR AND THE PUBLIC HEALTH

THIS week the Ministry of Health published a report by Sir Wilson Jameson, the chief medical officer, "*On the State of the Public Health During Six Years of War.*"[1] The enemies facing the public-health services—epidemic disease, malnutrition, and mental stress—were, as the history of 1918 suggested, potentially more menacing than the more usual hazards of battle. The same standard of planning was required to face both these threats to the nation's welfare, and the medical preparations for war were important threads in the larger pattern of national defence. Traditionally this country is supposed to "muddle through" its difficulties, but there are no signs that this was the way at the Ministry of Health. The menace of death in all its forms was faced, an intelligent appreciation reached, and a plan framed which was bold in conception, careful in detail, and yet elastic enough to meet the changing needs and fortunes of war. When it was put to the test there were of course failures and mistakes, but all in all the offensive-defensive campaigns waged by the Ministry and its satellites in town and country were as successful as those of the fighting Services.

It was soon realised that intelligence, in the military sense, was a first essential. Even before September, 1939, an intelligence section was established at the Ministry to provide information not only for the civil population but also for the military Services. During the war itself, field investigations on epidemic illness and sample surveys of patients in the E.M.S. hospitals and of minor sickness among the civil population kept the Ministry staff well informed. Gloomy if reasoned forecasts of casualties evoked a major effort in building up the staff, equipment, and organisation of the Emergency Medical Service. With the number of injured mercifully less than had been anticipated, the switch of the service to the less dramatic but none the less useful forms of medical care was rapid and effective. Experience in the blitz with the nation-wide civilian defence casualty organisation, and in particular the ambulance service, showed the advantages of large-scale administration in this field. Into the fight were called the auxiliary services of the laboratory. Blood-transfusion was widely used, and, as the report says, its practice "has increased prodigiously and will increase still further. Transfusion is a procedure directed to the treatment of disorders of the circulation. There is little in medicine on which the study of the circulation does not impinge and it is for this reason that the advances stimulated by the war in this field have had, and are likely to have more, profound repercussions in many fields of civilian medical practice." The Emergency Public Health Laboratory Service spread a net of laboratories, well-staffed and adequately equipped, over the whole country. These undertook not only routine diagnostic and public-health work but also valuable field researches on epidemic diseases.

While the responsibility for feeding the people lay elsewhere, the Ministry of Health busied itself with surveys of the essential foods. Insufficient diet, particularly when combined with overwork and overcrowding, brings in its train the risk of an increasing incidence of tuberculosis, and the preventive efforts of local-government doctors were redoubled. The hardships of war bear most heavily on expectant mothers and young children; their defences were strengthened by dietary supplements. The traditional association of Mars and Venus brought a rising incidence of venereal diseases, leading the Ministry to discard its last Victorian inhibitions and to embark on a virile and aggressive publicity campaign. Another enemy, insidious but disabling, was the anxiety and fear engendered by the onslaught on the civil population; it was countered by the ps logical selection tests and welfare work in industry, psychiatric treatment in special E.M.S. clinics.

What were the results of this campaign? The ulti arbiter must be the account of the nation's heal the vital statistics of the war years, for "facts are that winna ding." The infant and child mort rates are particularly sensitive indicators of social being; despite the loss, by enemy action, of the of 7000 children under the age of 15, and an increa accident deaths through war conditions, the mean death-rates in the three five-year groups under 15 below the rates for any year before 1939. New re for the second and third years of life were set up in 19 and new low levels for neonatal, infant, and mortality in the first ten years of life were attained 1944. The stillbirth-rate declined continuously th out the war, while successively lower records for mortality were established in 1940, 1942, 1943, and 1 Another index to national health is the tubercul death-rate. After a disquieting rise in 1939–41, t pre-war downward trend was resumed, to reach a ne low-level record in 1944. In the field of epidemic di the major triumph was the immunisation camp against diphtheria; in 1944, deaths were less than one third of the pre-war average, although this essentially preventable disease still caused more deaths than enemy bombs. Diseases such as typhoid fever, which have been expected to spread in the disturbances an dirt of bombed cities, were held in check, but there w an increase in scabies, food poisoning, and dysentery due, no doubt, to the difficulties of personal and culinary hygiene. Field research, stimulated by an awaken of the community's social conscience, uncovered t importance, as causes of disability, of rheumat anæmia, and accidents in the home; and the need special care for the aged. These are not new proble but their extent was highlighted by the statistics wh these studies produced.

The advantages of nation-wide organisation in preven tive medicine have been fully demonstrated. In the Health Service these advances can be consolidated administrative efficiency is tempered with humanity.

FOOD FROM THE SEA

IN normal times about thirteen million tons of is removed from the oceans of the world every Of this catch some is consumed directly, either fr preserved, or canned; but a large part goes to the ma of over a million tons of fish meal, which contribute indirectly to human diet through the nourishment farm animals and poultry; and the Antarctic whal industry produces upwards of half a million tons of of which a quarter of a million tons is converted eating. In the years before the war the average ann consumption of fish in this country was 16½ lb. per hea this was two or three times the consumption in France Germany, or the U.S.A., but only half that in Jap and possibly a tenth that in Norway. Measured by labou fish are a cheap source of first-class protein. There is wide variety of edible species, all highly nutritive a rich in minerals—the iodine content, for example, 50–200 times as great as that in any other food, wh that of calcium and phosphorus is as high as in bee Moreover, fish are available all the year round, and ne techniques of freezing enable such fatty fish as th herring, which vary with the seasons, to be distributed at their best throughout the year. Perhaps we do n benefit fully from the bounties of the sea. Certainl long usage has clouded our appreciation of this uniq harvest for which no field must be ploughed or cultivated, no seed sown, and no stocks tended.

As on land, animal life in the sea depends either directly or indirectly on plant life. This is found mainly

---

1. On the State of the Public Health During Six Years of War, 1939–45. Ministry of Health. H.M. Stationery Office, 1946. 5s.

e plankton, of which there are three groups— cers, consumers, and reducers. The producers rise largely the chlorophyll-bearing diatoms and which by solar energy build up organic matter inorganic nutrients in the water. The consumers oplankton feed on the living or dead matter of this plankton or its metabolic products, and are in turn umed by such fish as herring, pilchards, sprats, erel, and, curiously enough, one of the world's st mammals—the rorqual whale. Much of the g or dead plankton falls to the sea floor, where it is by the bottom fauna, including worms and shell- which in their turn form the food of the bottom- g fish. The amount of plankton is very large, being ially rich in some Polar areas, but varies from one n to another; it has been estimated that in the ish Channel alone the annual crop of phytoplankton unts to 3600 tons per square mile. Suggestions that plankton might be used directly as human food revived during the late war after a German report the zooplankton had a nutritive value equal to of the best meat, and the phytoplankton to that ye flour. Investigation showed, however, that probable yield from our seas did not warrant the blishment of a special fishery.

he reducers, the sea's bacteria, are particularly ortant to the marine life-cycle. As ZoBell has ntly indicated,[1] only a very small part (0·1%) of primary production of organic matter in the world's ns is removed each year in the form of fish, commer- algæ, &c.; the remaining residues and waste products lants and animals undergo bacterial decomposition return in mineralised forms to the sea and atmo- ere, where they supply the phytoplankton with the nents, such as nitrogen, phosphorus, and carbon, n which its cell substance is synthesised. Without se bacteria the sea floor would soon be cluttered up h a mass of dead plant and animal remains. and nt life, denied its essential elements, would cease. urther important function of aquatic bacteria is the version of dissolved organic matter into particulate anic matter (bacterial cell substance), which animals utilise. ZoBell himself has found that, given suitable ditions, bacteria can mineralise roughly 70% of the anic content of sea water and convert 30% into terial cell substance or intermediate products. It is atable, as he points out, whether bacteria are suffi- ntly abundant in sea water to constitute an appreciable n in the diet of marine animals, but cumulatively y are clearly important to the food cycles of both mals and plants.

A COMPASSIONATE RELEASE

N July several newspapers reported the case of a ng officer of the Royal Army Medical Corps who s released from the Service soon after the death of father, with whom he was in partnership. The press orts made it appear that his release was the result of ssure by a Member of Parliament to whom 400 tients were said to have written; and the patients med to have been actuated by a belief that this doctor s the only man who understood a method of treatment ctised by his late father. As may well be supposed, se newspaper reports have caused indignation, ecially among those whose tenure of one-man prac- es did not prevent their acceptance for service during war. We understand, however, that this officer s not in fact released on the ground that he is profes- nally indispensable at home: indeed, the local medical r committee, which judges such matters, decided that he was not. The War Office granted him compassionate release, obtainable in extreme cases of individual hardship of financial or domestic nature. Although there has been some relaxation since the end of the war in regard to one-man businesses (and practices) the number of Army medical officers granted compassionate release has been very small—less than 40 out of a total of over 8000 releases.

HOKEY-POKEY PENNY A LUMP

THE present outbreaks of enteric fever recall the profession's ancient quarrel with the uncontrolled sale of ice-cream. It is 67 years since a *Lancet* commission drew attention to the appallingly filthy conditions in which ice-cream was made in the Italian quarter of London.[1] Gone are the days of "penny a lump," but "hokey-pokey" (the Cockney's rendering of the Italian *ecco poco* or "here's a bit") and the outbreaks are still with us. In the interval ice-cream has been credited with ptomaine poisoning, carbolic-acid poisoning, zinc poisoning, and scarlet fever, as well as recurrent outbreaks of enteric. An outbreak of unspecified diarrhœa in Lancashire was traced to premises with "two vessels containing ice-cream in process of manufacture . . . within a yard of a pail-closet; and the fine strainer used for straining the milk and cornflour after boiling was within about four inches of a dolly tub in which were babies' napkins soiled with diarrhœal excreta."[2] Advances in bacteriology served to underline the extent of the scandal. Thus in 1894 the medical officer of health for Islington found in specimens of ice-cream "almost uncountable colonies of *Bact. coli*"[3]; and in 1897 the M.O.H. of Liverpool was impressed with "the marked similarity between plate cultivations of the ice-creams . . . and those of sewage."[4] Only fourteen years ago bacterial counts were found to range from 625,000 to 265,000,000 per c.cm.[5]

In the nineties some local authorities and the larger manufacturers were pressing for regulation of manufacture and distribution, but it was not until the enactment of the London County Council (General Powers) Act of 1902 that the first specific control was imposed. "It is difficult to believe that such categorical exposure of a foul danger to public health should not have been followed by reform until more than twenty years have passed."[6] In 1927 the Ice-Cream Association of Great Britain and Ireland invited the Minister of Health to propose a legal definition of ice-cream and to enforce the licensing by local authorities of all makers and vendors, whose premises should be inspected[7]; but no action was taken. Since then some authorities, and notably Hove, which provisionally adopted the same standard as for pasteurised milk,[8] have shown themselves increasingly alive to the risks. Last year a Ministry of Food order prohibited the admixture, except by licence, of dried eggs, since these may contain salmonella organisms; under the licence makers must pasteurise the mix within two hours of manufacture. and must observe certain other precautions. Otherwise, "it is only when conditions of manufacture are grossly insanitary that the Food and Drugs Act, 1938, is called in to protect the public."[9] Most of us will therefore agree wholeheartedly with the resolution passed by the conference of sanitary inspectors at Westminster on Sept. 5 calling for the compulsory registration of all ice-cream vendors. Until this step is taken no comprehensive plan of control is possible.

THE annual Harveian oration will be delivered at the Royal College of Physicians by Sir Maurice Cassidy on Friday, Oct. 18, at 3 P.M. His subject will be Coronary Disease.

Marine Microbiology. Claude E. ZoBell, PH.D., associate professor of marine microbiology, Scripps Institute of Oceanography, University of California. Waltham, Mass.: Chronica Botanica Co. (in London from Wm. Dawson and Sons Ltd.). Pp. 240. $5.

1 *Lancet*, 1879, ii, 590. 2. *Ibid*, 1900, ii, 1149. 3. *Ibid*, 1894, ii, 862.
4. *Ibid*, 1897, ii, 1458. 5. *Ibid*, 1932, ii, 1230. 6. *Ibid*, 1902, ii, 998.
7. *Ibid*, 1927, ii, 896. 8. *Ibid*, 1938, ii, 1084. 9. *Ibid*, 1945, ii, 214.

Special Articles

LENGTH OF STAY IN HOSPITAL

Frances Gardner * L. J. Witts
M.D. Lond., M.R.C.P. M.D. Manc., F.R.C.P.
From the Nuffield Department of Clinical Medicine, Radcliffe Infirmary, Oxford

It has recently been suggested that the need for hospital beds could be diminished by the provision of better facilities for outpatients or by the building of hostels for patients who require only one or two nights' accommodation for investigation or other purposes (*Lancet* 1943, Lister 1945, Morgan 1945, Nelson-Jones 1946). Others have urged the creation of special wards or hospitals for illnesses which cannot be classed as incurable but nevertheless require protracted or specialised treatment; rheumatoid arthritis, peptic ulcer, ulcerative colitis, and nephritis have been put in this category.

With these suggestions in mind, we have recently analysed a year's admissions to a medical ward of 21 beds, 10 male and 11 female. The ward is essentially a diagnostic and research unit. There was great pressure on our beds during the year under review, as the Radcliffe Infirmary, which serves a population of 250,000, had at that time only 80 general medical beds, and there were no other medical beds in the area except in cottage hospitals or hospitals of the poor-law type. The ward was protected from the full pressure of the competition for beds by the fact that it was " on take " on only one day a week. In other words, though containing one-quarter of the medical beds, it admitted only one-seventh of the emergencies which came into the medical side of the hospital. In spite of this, over 30% of the admissions were emergencies.

During the period under review 180 men and 175 women were admitted to the ward. Though the total number of patients was 355, the total number of admissions was 440, because 28 patients were readmitted on one or more occasions during the year. The average proportion of occupied beds was 19 out of 21; 626 (8%) of the available bed-days were wasted. This wastage was partly due to temporary war-time conditions —beds had to be kept empty and available for D-day casualties—but it was also an inevitable result of the system of emergency admissions. All emergency cases must be admitted on the day of "take." It therefore behoves the house-officer to arrange the discharge of patients so that some beds are empty on the appropriate day, and it is impossible to estimate with accuracy the number of beds required.

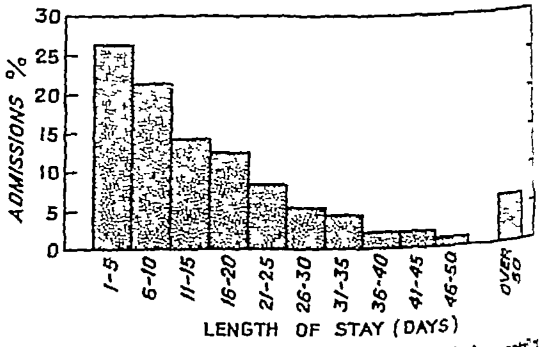
The average duration of stay in hospital was about 16 days, but the accompanying figure shows that this average figure is somewhat misleading. The largest fraction of patients stays the shortest time in hospital, and the proportion of patients remaining in hospital steadily declines as the period of treatment increases. The length of stay in 26% of admissions was less than six days, and in nearly 50% of cases the patient was discharged within eleven days of entering hospital. At the other extreme is the group of 24 patients who were in hospital for more than fifty days. They accounted for 1772 bed-days, which may be roughly expressed by saying that 5% of the admissions accounted for 25% of the bed-days. An analysis of the whole series of patients will be published by us elsewhere, and we deal below only with the two extremes of short and long admissions.

SHORT ADMISSIONS

The reasons for inpatient treatment of the patients who stayed less than six days are shown in table I: 66 patients in this group were responsible for 113 sions; 27 were admitted as emergencies for the tre of acute illness, and 10 of these died shortly admission, the remainder being either discharged transferred to other hospitals within a few days. the other patients were admitted from the waiting- 17 patients were admitted for follow-up examinat coming either from other areas or from remote p of the surrounding counties; 11 patients unde treatment with thiouracil were repeatedly adm for estimation of basal metabolic rate, a for 54 short admissions; 3 patients were res sible for 5 admissions for blood-transfusions; the remaining 8 patients were admitted for investigations.

In all, 39 patients from the waiting-list were respo for 86 admissions and 151 (2%) of the bed-days. stays in hospital of this kind undoubtedly give ris some administrative problems. They tend to smooth routine in a busy medical ward. Most of patients are in fair health and often in full employme and they may resent the small restrictions which must imposed in a hospital ward. Moreover, the amount nursing time devoted to them seems out of p to their needs. These are the considerations have led to the suggestion that patients of type might equally well be treated in the outpatie department.

It is possible to divide the short-stay patients admitt from the waiting-list into two groups. The first those who require a bed overnight, either because examination, such as cholecystogram or basal metabol is to be carried out fasting, or because the patient li too far away to travel to and from hospital in one d Admissions of this kind can be arranged to suit t convenience of the patient and the hospital, and pati should rarely need to stay more than one night. other group is constituted by patients who come i a short treatment, such as transfusion or paracent and require a bed for about twenty-four hours. admissions can also be planned ahead, though not so f ahead as the first group, and the patients are more li to overstay the expected time because things go wro The division is not hard and fast, for some investigatio such as lumbar puncture and gastroscopy, entail a reco period. Follow-up patients come into both grou Indeed, it is only necessary to make an analysis of t kind to realise that the antithesis between outpatie and inpatients is false; rather should we think of t key hospital as a centre for diagnosis and special trea ment, which may or may not require the patient admission.



Frequency histogram to show the percentage of admissions ent different lengths of stay in hospital.

The need for short stays in hospital grows steadi with advances in diagnosis and treatment. Period transfusions for refractory anæmia, estimation of the metabolism of patients receiving thiouracil, and desensitisation to liver of patients with pernicio

---

* With a grant from the Medical Research Council.

I—REASONS FOR ADMISSION OF PATIENTS WHO STAYED IN HOSPITAL LESS THAN SIX DAYS

Reason for admission	Patients	Admissions
e illness—		
ed	10	10
r diagnosis and treatment	17	17
›w-up examination and investigation	17	18
nation of basal metabolic rate	11	54
d-transfusion	3	5
roscopy	2	2
nal puncture	2	2
ıbar puncture	1	1
ıcentesis of abdomen	1	2
iography	1	1
ellaneous	1	1
Total	66	113

ıia are examples of recent additions to the list. sport to and from hospital inevitably presents derable difficulties in a rural area, and often stigations arranged for outpatients would be more ditiously and conveniently completed if a night's ng could be provided. Far from using outpatient ties inadequately, we believe we are using them cess. It would be kinder to admit to hospital some e patients who now undergo tedious and exhausting stigations as outpatients, but shortage of beds made it impossible. It is probably true that when possible to consider the comfort of the patient more ly the demand for short-term accommodation will tly increase.

LONG ADMISSIONS

he reasons for prolonged inpatient treatment in the atients who were in hospital longer than fifty days shown in table II. Many of them were gravely ill, and them had died by the time of the follow-up, from one wo years later. The largest fraction was made up 4 patients who underwent surgical treatment after ical investigation; 2 patients were kept in hospital ıuse they were the subjects of research, and 2 others ıuse it was difficult to find accommodation for them where—a woman needing special X-ray therapy, a boy dying of lymphosarcoma. The remaining re a heterogeneous group who had in common only fact that they required prolonged medical treatıt. In retrospect it appears that only 3 of these patients (rheumatoid arthritis, nephritis, and ulcerative tis), accounting for 260 (less than 4%) of the available l-days, could have been referred to a long-stay hosıl, if such had been available.

LE II—REASONS FOR STAY IN HOSPITAL LONGER THAN 50 DAYS

	Cases		Cases
ical intervention	14	*Long-term treatment*	6
plenectomy	5	Pituitary cachexia	1
astric surgery	3	Puerperal fever	1
holecystectomy	2	Rheumatoid arthritis	1
ephrectomy	1	Subacute nephritis	1
iscellaneous	3	Thyrotoxicosis	1
ulty in obtaining institional care	2	Ulcerative colitis	1
ymphosarcoma	1		
eticulosis	1	*Research*	2

A different picture was obtained when we inquired into fate of some of the patients with chronic diseases who yed in hospital less than fifty days. In table III have summarised the data for all cases of peptic ulcer, umatoid arthritis, ulcerative colitis, and nephritis this group. Many of these patients had been incapacitated for more than a year before admission to hospital. They remained in hospital only three weeks on the average and then were discharged home, sometimes with a short interval in a convalescent home or cottage hospital. The results of treatment have been strikingly unsuccessful: 8 of the 12 patients have required readmission, and only 6 of them are back at work, from one to two years later. Therapeutic failure may be inherent in the nature of these diseases, though one would not judge so from reading textbooks of medicine and treatment. A more justifiable comment would be that the diagnostic hospital is not adapted to the treatment of subacute and chronic illness. Patients with peptic ulcer and similar diseases are not admitted unless there is some complication, such as vomiting, hæmorrhage, or intractable pain; and, when they are admitted, they are often discharged before treatment could be effective. This is largely the result of shortage of beds, but there are also reasons which must be included under the heading of psychological attitudes and motivation. Both diagnostic and teaching hospitals are driven to regard themselves as sorting- and clearing-houses, and the tempo is too swift for great interest to be taken in protracted therapeutic procedures.

DISCUSSION

Short-stay admissions are important because of their increasing frequency, long-stay admissions because they account for a relatively high proportion of occupied beds. Both are of particular interest to the outpatient physician, who has the hard task of selecting patients for admission. We do not find that patients who could be dealt with as outpatients are being admitted to hospital unnecessarily. On the contrary, the work of the outpatient department would be easier if some of the patients now investigated there were admitted to hospital for one or two nights. We therefore agree with Rock Carling and Power (1943), who pointed out that the existence of a highly organised and efficient outpatient service is likely to increase rather than diminish the demand for beds. Our main criticism of the present arrangements for admission is that too much responsibility is left with house-officers and administrative staff, and that more care might still be taken in selecting patients from the waiting-list and in correlating the outpatient and inpatient work of the unit. The rival claims of medical urgency, social stress, and efficient employment of the ward need balancing, and doctor, secretary, and almoner should combine in the task. Whenever a patient fails to enter hospital when written for, an inquiry should be made by the almoner.

Our review has less bearing on the problem of long-stay hospitals. There is little doubt that the potential demand for accommodation for long-stay cases is very

TABLE III—ANALYSIS OF PATIENTS WITH CHRONIC ILLNESS WHO STAYED IN HOSPITAL LESS THAN 50 DAYS

Disease	Patients	Average duration of stay in hospital (days)	Average duration of incapacity (months)		Patients readmitted
			Before discharge	After discharge	
Peptic ulcer	7	18	24	12	4
Rheumatoid arthritis	3	22	14	13	2
Ulcerative colitis	1	44	30	24	1
Nephritis	1	18	None	22	1
Total	12	21	12*	14	8

* This figure represents the mode or usual duration of incapacity, and not the average, which is distorted by a few very chronic cases.

great. It could be better assessed from an analysis of the records of outpatient clinics and X-ray departments than from a study of this kind. With the present shortage of beds, the physician seeing outpatients rarely attempts to secure admission for cases of peptic ulceration and rheumatoid arthritis; and, when such patients are admitted, they are referred within a few weeks for treatment in convalescent hospitals, their own homes, or the outpatient department. All that we can say is that provision of hospitals for prolonged treatment of these patients would not greatly relieve the pressure on beds required for purposes of diagnosis. By the same logic it should not reduce the variety of clinical material in the teaching hospitals. Any measure which entirely removed chronic illness from the teaching hospitals would have a lamentable effect on the training of nurses and students and on the advancement of knowledge.

The present tendency to specialisation in medicine, both by individuals and by departments, is continuously raising obstacles to the communication of ideas and to the integration of treatment. Sickness is not just a production job which can be broken down into separate elements and treated by the methods of modern mass manufacture. It is a personal and individual problem, and the operative proverb is "too many cooks spoil the broth," and not "many hands make light work." In a previous paper from this department, the need for continuity in treatment was heavily underlined (Brown and Carling 1945). The community hospital has a corporate spirit, which might be weakened by overelaboration of function and loss of adaptability. What is required today is not a further specialisation of purpose but an internal reconstruction. At present the medical beds in hospitals in this country are usually divided into a series of separate units or firms which work more or less independently and whose chiefs have a great sense of pride and property in their charge. This traditional arrangement is steadily becoming less adapted to the needs of the patient and the medical student. It is suggested that the time has come for a division on more functional lines.

If we think in terms of patients, we find that we have to deal with emergency admissions, usually of acutely ill patients; short-stay admissions from the waiting-list of patients who are not ill and do not require much nursing; and medium- and long-stay admissions. If we translate these demands into bricks and mortar, we shall design a medical unit which consists of three sections: (1) the diagnostic and treatment unit, which would correspond very closely with our present ward; (2) the short-stay ward or hostel, which would cost half as much per bed-week; and (3) the long-stay ward, where the emphasis would be on treatment and research. All these three adjoining sections would be the field of work of one team of nurses, technicians, assistants, and physicians, whose outpatient department would be on the same floor or at least connected by direct lift. The optimal size of a unit of this kind would probably be about 75 to 100 beds. With less beds than this the subsections for the two sexes would become too small for effective working, whereas a larger number of beds would be too many for an integrated unit with a life and personality of its own.

For several reasons we are opposed to the suggestion that special hostels should be provided for short-term admissions of every kind, and that these hostels should be separate from the wards of the hospital. The clinical field is already divided into too many separate compartments, and we do not want to split it up further. Most of our short-term patients enter for follow-up or for special treatment, and they like to come back to the ward where treatment was started and where they feel that their case is understood. The introduction of hostels would be only too likely to bring its own crop of psychological and administrative problems. Even the recurrent type of admission is sometimes inadequ supervised, as the period of observation extends several generations of house-officers. Lack of supervision is obviously undesirable, and it may dangerous in protracted treatment with thiour sulphonamide drugs. Recurrent admissions are essent part of the follow-up work of the ward. Evidence the value of following up all patients who have admitted to hospital has been published from this dep ment (Brown and Carling 1945). We believe that follow-up should be separated from the diagnostic of the outpatient department, and that it should be out in close proximity to the ward. The same tea senior medical officer, secretary, and almoner shoul responsible not only for the selection of cases waiting-list but also for the general follow-up and supervision of recurrent admissions.

SUMMARY

We have analysed 440 consecutive admissions medical ward which is essentially a diagnostic research unit.

Short-stay cases form a high proportion of the ad sions, but there is no evidence that the number coul have been reduced without detriment to the p by provision of better outpatient facilities.

Patients who were in hospital for more than fifty account for only 5% of the admissions but 25% of bed-days. More than half of them were patients eventually required surgical treatment. Only 3 pati in this group, accounting for less than 4% of the days, could have been referred to a long-stay hos or a centre for special treatment.

Special accommodation for short-stay and long cases would have released only 6% of the bed-days, therefore would not have relieved to any great ex pressure on the beds required for diagnostic purpos

Patients who might be expected to need pro treatment seem to have been admitted to hospital wi some reluctance owing to shortage of beds, and were often discharged prematurely. The results treatment in this group were strikingly unsucc The need for long-stay accommodation could be estimated from an analysis of outpatient and X-ray re than from a study of this kind. It is undoubtedly gr

The common practice of splitting the medical be a hospital into small autonomous units does not ideal. They should be arranged in functional grou to meet the needs of the different types of admiss

We are indebted to Miss I. F. Beck for much help in tr patients and analysing the data. For suggestions for ho design we have obviously borrowed from the ideas of Sir Rock Carling.

REFERENCES

Brown, M., Carling, F. C. (1945) *Brit. med. J.* i, 478.
Carling, E. R., Power, C. M. (1943) *Lancet*, ii, 619.
Lancet (1943) ii, 545.
Lister, W. A. (1945) *Lancet*, ii, 757.
Morgan, D. G. (1945) *Ibid*, p. 795.
Nelson-Jones, A. (1946) *Ibid*, i, 70.

"Medical schools are charged with the responsibility admitting not those who say, however earnestly, that want to study medicine, but those judged to have the vation, industry and ability for the pursuit of a profes involving the health and the lives of the people who seek medical aid in the years to come. The admissio students lacking the qualifications for a medical car wasteful and harmful no matter how much the student thinks he would like such a career. The cost of failure medical school, in money and time and work and disapp ment, is so great that extreme care must be exercised the selection of students, even if enrolments decrease. Fr man enrolments in 1946 will exceed 5500 mainly becaus the many veterans admitted . . . about 60% will be in category. . . . About 12% are women."—*J. Amer.* *Ass.* August 17, p. 1355.

A NEW HEALTH SERVICE

THE DESIGN IN SOUTHERN RHODESIA

rksome and circuitous as the methods of democracy seem to harassed administrators, in the long run the ts are more stable and permanent. Progress in public h must be built increasingly on the basis of an informed ic opinion and intelligent public coöperation. There a democratic country no short cut."

ɔn this principle the commission which has been ing into the health services of Southern Rhodesia [1] m to affirm that the colony has now passed the r stage and must therefore proceed by democratic ıds. In its recommendations it has sought to freedom of action and choice for doctor and patient to free the citizen from the fear of financial rassment through ill health, while yet leaving him oulder some responsibility; and to intervene to le services only where they are not already being ntly provided at a reasonable cost.

introduce a national health service in Southern esia may be at once more difficult and easier than s country, for in the colony there is already a govern- medical service and all the European hospitals t one are government hospitals. Some of the more us administrative snags are thus absent. But ıern Rhodesia has the heavy responsibility of a large npoverished African population, who will be able to ibute only a small part of what must be spent on . The commission firmly opposes any attempt to expenditure on African health to African revenue.

e commission is equally convinced that health prob- are indivisible, and that, though methods of dealing each section of the population may vary, a national ce must cover everybody. It therefore proposes for all races hospital treatment, maternity and X-ray ment, and laboratory services should be provided by State. And though the individual is to be left to for his general practitioner, his dentist, his surgical ance, and his drugs, his burden is to be adjusted to nancial strength: the maximum he will be asked to for these services in any one year will range from £2 me of £100) to £55 (income £2000). All amounts e this will be met from a national medical fund on uction of the doctor's receipted account. The imum covers the doctor's bill for a whole family, h means that married men with children will probably heavier claims on the fund than bachelors or less couples. No contributions have to be paid, t of course from general taxation. Patients who do wish to accept the salaried consultant staff at the itals must pay the full rates at the hospitals as well heir private doctor's fee. A medical committee of rol, on which laymen as well as doctors would be esented, will be set up to investigate cases in which ssive visiting or excessive prescribing is suspected.

ıe commission recommends the creation of a separate ırtment of health directly responsible to the minister ıealth. It also proposes the establishment of a ɔnal health board and the division of the colony into regions with further subdivisions of areas which ld approximate to the present native districts. The d would have nine members, including representatives he regions, the secretaries for health and native rs, and two doctors. Its functions would be advisory policy-making and it would have the duty of drawing national health plan from the plans submitted by the ɔns. Each of the regions would in turn have its ıcil, again an advisory and planning body, and in region and area there would be a medical officer of th in charge of the State health services.

ssuming that right of private practice will be with- vn, the following salaries are suggested for doctors in new service: secretary for health, £2250; consultants,)0–£2500; directors of public health or research,)0–£2000; regional M.O.H.S, £1500–£1750; area H.S. £750–£1500. The general scale for government ical officers (£750–£50–£1500) will, it is felt, not attract doctors into the service but retain them in it.

The larger local authorities which are able and willing to carry out environmental services should continue to do so and should be given financial help to expand them. But in general the smaller municipalities should look towards further expansion of their health services as integral parts of their areas. Similarly, though the State will assume responsibility for the treatment and prevention of venereal diseases and institutional maternity work, municipalities and voluntary organisations will be encouraged and helped to continue any clinics which they are running. The mines and mission hospitals for natives will also be subsidised.

The commission also open the way to a great expansion of the preventive services of the colony with proposals that a nutrition council and a research council should be set up. The members included Prof. C. F. M. Saint, M.S. (chairman), and Dr. T. G. Burnett.

---

[1] eport of the Commission presented to the Legislative Assembly, June, 1946. Government Stationery Office, Salisbury, Southern Rhodesia, 1946. Pp. 124.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED AUGUST 31

Notifications.—Smallpox, 0; scarlet fever, 744; whooping-cough, 1976; diphtheria, 262; paratyphoid, 44; typhoid, 27; measles (excluding rubella), 1565; pneumonia (primary or influenzal), 279; cerebrospinal fever, 41; poliomyelitis, 21; polio-encephalitis, 4; encephalitis lethargica, 0; dysentery, 74; puerperal pyrexia, 131; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on August 28 was 854. During the previous week the following cases were admitted: scarlet fever, 46; diphtheria, 17; measles, 42; whooping-cough, 43.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from enteric fever, 2 (0) from measles, 9 (0) from whooping-cough, 5 (0) from diphtheria, 31 (5) from diarrhœa and enteritis under two years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

Halifax reported the fatal case of an enteric fever.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 31 per thousand total births), including 40 in London.

On Active Service

CASUALTIES

KILLED

Lieut.-Colonel Andrew Robert Fausset Clarke, M.C., M.B. Edin., R.A.M.C.
Major C. L. Lewis, R.A.M.C.
Captain Roylance Lynton Parkinson, M.R.C.S., R.A.M.C.
Lieutenant Geoffrey Rogers, M.R.C.S., R.A.M.C.
Captain John Varley Schofield, M.B. Leeds, R.A.M.C.
Lieutenant William Frederick Jayne Weston, M.R.C.S., R.A.M.C.

PREVIOUSLY REPORTED PRISONER-OF-WAR, NOW REPORTED DIED AS P.O.W.

Lieut.-Colonel Cyril Armstrong, M.B.E., M.D. Durh., R.A.M.C.
Captain Henry Alexander Deverell, M.B. Edin., R.A.M.C.
Captain Alfred Kenneth Eastwood, M.R.C.S., R.A.M.C.
Captain Basil Frederick Benbow Gulliver, M.C., M.B. Lond., R.A.M.C.

DIED

Captain James Lavington Ashley, M.B. Brist., R.A.M.C.
Captain James Raymond Dunn, M.R.C.S., R.A.M.C.
Captain Paul Verrier Isaac, M.B. Lond., R.A.M.C.
Captain Archibald David Morrison King, M.B. Edin., R.A.M.C.
Colonel Sidney John Liddon Lindeman, O.B.E., M.C., M.R.C.S., R.A.M.C.
Captain Wilfred Kendrick Lloyd, M.B. Birm., R.A.M.C.
Captain M. M. Loughnan, R.A.M.C.
Major Ewen Arthur Elson Palmer, M.B. Camb., R.A.M.C.
Colonel Michael James Whelton, M.D. N.U.I., R.A.M.C.
Major Edmund Hugh Lewis Wigram, M.B. Camb., R.A.M.C.

WOUNDED

Captain J. K. A. Burn, M.B. Aberd., R.A.M.C.

In England Now

A Running Commentary by Peripatetic Correspondents

"OF course," said the German Mayor, "we quite understand that at the end of an unexpectedly victorious war you must be a little disorganised and that your Military Government is a temporary affair, but when is the real government coming out?" This was said some four months after the end of the war. Nobody would think of saying it now, I fancy, but with the Dodo in *Alice* might talk about the Caucus-race. You remember?

"What is a Caucus-race?" said Alice. "Why," said the Dodo, "the best way to explain it is to do it." First it marked out a race-course in a sort of a circle; then the party were placed along the course here and there. They began running when they liked, and left off when they liked, so that it was not easy to know when the race was over. . . . Then the Dodo suddenly called out "The race is over, everybody has won, and everybody must have prizes." Unfortunately for us the prizes on this occasion are given jointly by the British taxpayer and the German population. Since the German population is already subsidised by the taxpayer to the tune of eighty million a year, our administration of Germany bids well to become the most expensive that bureaucracy has ever succeeded in foisting on any people. Not that there are not many well-qualified and devoted administrators in the service; there are. To them the restrictions inevitably imposed by the uncertainty of international affairs, limiting as it does their planning and organisation, must be irksome. There are however far too many to whom the service means a cushy job at a big salary without expenses. To these must be added the large group of people, unsettled by the non-recurring opportunities of the war, who are unable to reseat themselves in normal civilian life but find a haven in the peculiar conditions that obtain in Germany.

It is a little galling to find that a Control Commission driver gets (I do not say earns) a bigger salary than a captain, R.A.M.C., and that an ex-corporal can return to an almost non-existent job at a salary of eight to ten pounds a week with negligible expenses.

There are welcome signs that Authority is not unaware of all this and is taking steps to remedy the defects. Much harm has already been done to our prestige over here, and it is high time to restore it to the position it held at the end of the fighting.

It is perhaps unfortunate that this period should coincide with the arrival of the first families who will absorb a great deal of accommodation sadly needed by the Germans themselves. This new influx is perhaps the most unpopular measure that we have yet conceived. Touching, as it does, only a fragment of the army out here it is debatable whether the atmosphere of artificial comfort provided for the families will do anything but estrange both the Germans and a large number of British as well. What we are seeing in Germany is not what we mean by the "British Way of Life." It is to be hoped that those wives who do come out will realise how important it is that they should bring with them the influences that go to make a British home.

The Control Commission has to face difficulties as great as any that have faced our colonial administrations. In the past, selection for the Colonial Services has been stringent, and the results usually good. Should not the same principle be applied to this, the newest of all our administrative services?

* * *

Mumpsimus, "a traditional custom obstinately adhered to however unreasonable it may be." Woe is me! My conscience pricks badly. Every day I meet a myth or a mumpsimus about the hospital and do nothing about it: it does no harm, I murmur, and let it pass. What of the nursing woman-hours wasted; what of discomfort and indignity endured in vain?

I speak here with added authority. Only last week I myself was sigmoidoscoped. The appointment was for 11 A.M. At 5 A.M. I was rudely awakened by the clank of the loaded trolley and my opening eyes beheld a gallon-measure full of soapy water and a large bucket full of mackintoshes. The actual washout was only slightly uncomfortable, the fluid gravitating in and in and out of my empty rectum without let or hindr when it was over I fell asleep again. At 8.30 I ate a b breakfast, at 9 allowed my lower bowel to empty a its wont, then wrote letters till my hour was come.

Now why, oh why that eerie ceremony at dawn? the nursing staff feel they ought to prepare their pat for parade? Must the rectal mucosa have its wash- brush-up, spit-and-polish? Should we not declare mumpsimus, reasoning that in six hours anything happen, and it doesn't really matter if it does?

* * *

Some griefs are med'cinable, quotes an advertiser discussing the troubles which cause nervous indi and the merits of a dietary product in its relief. very true, no doubt, but why press Cymbeline into vice? Medicinable means medicinal, capable of he and not medicable, capable of being healed. And w possesses this power of healing? Clearly grief, or s griefs. Grief is the healer, not the to-be-healed. W we wait for Belarius to make this abundantly clear?

Great griefs, I see, medicine the less; for Cloten
Is quite forgot. (IV, ii, 244.)

But let Imogen speak for herself. On receiving h husband's letter, she exclaims:

You good gods,
Let what is here contain'd relish of love,
Of my lord's health, of his content,—yet not
That we two are asunder; (let that grieve him:
Some griefs are med'cinable; that is one of them,
For it doth physic love)—of his content,
All but in that! (III, ii, 28.)

No other play has all these three: medicinable, a the verbs to medicine and to physic. To medicine occ only once more, in Iago's terrible boast:

Not poppy, nor mandragora,
Nor all the drowsy syrups of the world,
Shall ever medicine thee to that sweet sleep
Which thou owedst yesterday. (III, iii, 330.)

Some griefs, we learn, are medicinable; Othello's not one of them:

Fell sorrow's tooth doth never rankle more
Than when it bites, but lanceth not the sore.
(Richard II, I, iii, 297

* * *

The psychiatrist went as a bicycle to the ship's fa dress dance, the surgeon as Ohm's law, and I— everyone said that I, complete with stomacher a periwig, looked the living image of Archimedes imm diately before attaining notoriety in the first M.B. T is everyone except the capstan-minder's mate, who f some reason was judging the competition.

He had not liked me from the day I had pointed o to the captain that the sprockets were rusty. I sh here explain that the Sea Salt's Code shows clearly t simply the inevitable consequences of rusty sprock Just as Q.E.D. ends all theorems everywhere, whe anything has been proved or not, so the rule that o rusty sprocket equals three small keelhauls—"sma indicating that the thin end of the boat be used for t operation—holds on all ships, on all the ponds of t earth. The capstan-minder's mate, one might say, h out-sprocketed himself, in that not only were t 15 sprockets rusty, but 7 more were so sclerosed as to b useless. I am surely not to blame because the wretch fellow was under water for most of the time between t equator and latitude 754. This should be no reason f deliberately mistaking me for a hors-d'œuvre var and giving the prize to the psychiatrist, whose ty were not even pumped up.

* * *

It was Sunday morning and I had to visit an outly hospital. My daughter, aged eight, came along and s she had become rather bored during the car ride I to her in to see the children's ward. While I stood talki to sister one of the nurses showed her around. ". . . a this little boy fell off a ladder. . . . This little girl has a ver bad cough." And then my daughter, wanting to sho an intelligent interest, was heard to say: "I wonder— have any of them got V.D.?" I understand that the poster showing a bereaved widow was withdraw because it depressed people. On my part, I should to raise an embarrassed voice to ask the Ministry o Health to stop *their* poster campaign!

Letters to the Editor

ALMROTH WRIGHT AND ANTI-TYPHOID INOCULATION

ı,—Sir Almroth Wright has just passed his eighty- birthday and the *Times* has reminded us that this is also the fiftieth anniversary of the beginning of vork on prophylactic inoculation against typhoid . That work was an outstanding landmark in the ry of medicine, not only because of its immense tical results but because it demonstrated the possi- of evaluating the changes in an inoculated person's d which result from successful immunisation. From time immunisation ceased to be a hit-and-miss edure.

right himself, in his first paper on the subject, was ful to point out that the idea of using prophylactic unisation against typhoid fever (and also the use of n-living vaccine for the purpose) had come to him ı Haffkine who had applied a similar procedure in bating cholera in India. It is, however, beyond ot that the whole credit for working out anti-typhoid unisation, and for getting it adopted in the British y in spite of considerable opposition from some in places, belongs to Wright.

ı view of this it is surprising to read in Dr. Guthrie's at *History of Medicine* that

> "During the South African War of 1899–1902 typhoid ver was a more formidable foe than the enemy and counted for twice as many deaths as his weapons. In e Great War typhoid fever was relatively rare and, even in e most unhealthy centre, that of Gallipoli, the incidence as very small, and the enormous improvement was most entirely due to the success of anti-typhoid inocula- on. This happy result may be traced to the labours of ıe man—Sir William Boog Leishman (1865–1926), a edical graduate of Glasgow.[3]"

, in a later sentence:

> "Along with Sir Almroth Wright, who preceded him as rofessor of Pathology in the Army Medical College at etley, and whose name is closely linked with the discovery vaccine therapy, Leishman set himself to devise a system inoculation against typhoid. . . ."

he reference given in the above quotation is to e 1058 of Sir Harold Scott's *History of Tropical licine*, but it is difficult to see how the relevant ence on that page can support Dr. Guthrie's state- ıt. It reads as follows:

> "In 1897 he (Leishman) returned to England and was osted to the Victoria Hospital, Netley, as Medical Officer. etley was at that time the headquarters of the Army edical School, later transferred to Millbank as the Royal rmy Medical College. Dr. (later Sir) Almroth Wright as then Professor of Pathology and Leishman gained sperience under him and together they inaugurated oculation against typhoid fever. He also assisted Wright ı his work on anti-typhoid inoculation in the South frican War and in opsonic investigations of the staphylo- occus and brucella melitensis."

another page Sir Harold Scott refers to "Sir Almroth ght's anti-typhoid vaccine."

t is to be noted that Wright's anti-typhoid work an in the summer of 1896 (see *Lancet* of Sept. 19, 6, p. 807); whereas, according to Sir Harold Scott's ement, Leishman was posted to Netley in 1897 as lical officer. It is also noteworthy that Leishman's ıe appears as joint author of only one of the series five important papers on anti-typhoid inoculation lished by Wright between 1897 and 1901, the one earing on Jan. 20, 1900, in the *British Medical rnal*—that is, 3½ years after the beginning of the work. o check my memory (not at first hand) of these nts, I recently wrote to one who was a pupil of ght's at Netley and himself took part in the early k on anti-typhoid inoculation. He replied that, in view, "Wright and Wright alone was the originator nti-typhoid inoculation with killed vaccine"; and ıdds that Leishman was not even on the laboratory f at that time. "He had nothing to do with the oduction of anti-typhoid vaccine."

It would seem, then, that Dr. Guthrie has in some way been misinformed on this matter. I hope that, in honour of the greatest figure in English bacteriology, this mistaken attribution of credit may be put right before it gets copied into other books.

Birmingham Accident Hospital.   LEONARD COLEBROOK.

MYTH AND MUMPSIMUS

SIR,—The author of your opening article of August 31 must surely be a young man who delights in pulling the legs of the elderly, but even the presbyopic must see that he is erecting Aunt Sallies for the simple pleasure of knocking them down. On the high spirits and harmless games of youth it would be ungracious to frown, but some of his statements require modification.

1. Dr. Forbes lumps together phlebotomy and exorcism and consigns them both to Limbo. But exorcism was surely always a priestly performance, and phlebotomy properly practised is as useful today as it was in the years before its very success led to its disastrous excess.
2. He appears to approve of increasing the fluid intake if large doses of sulphonamides are given, but he scorns any other reason for promoting diuresis. Are there no other drugs whose concentrated presence may damage the kidneys?
3. He scoffs at diaphoresis and hot baths, but has he never known their benison after a long day in the saddle? Is there no physiological explanation for tired and stiff muscles and have we not in steam a proper therapy?
4. The next time he has to cope with an outbreak of gastro-enteritis, I will wager my old Culpeper to his new Martindale that he will achieve far quicker healing if he will give his patients an ounce of castor oil before he starts them on sulphaguanidine. He writes: "*horribile dictu.*" I reply: "*experto crede.*"
5. Dr. Forbes's fundamental conclusions about enemata and his rejection of all solutions except normal saline may appeal to the youth who has never known the agony of rectal ballooning, but these conclusions will annoy the clinician who has seen what relief a turpentine enema can produce when all the normal saline in the ward has failed to charm forth any scybalæ. He states that "the complete efficacy of normal saline was proved long ago." By whom and where and when?
6. Dr. Forbes then pens the following sentence: "The adolescent girl who is pale, who will not eat, and who faints easily is in all probability working *too hard* at school and pining with unrequited love for her form mistress." This he calls a psychological upset. Has he never seen a case of chlorosis?
7. He says, "leeching and blistering which survived and were universally practised for centuries and yet have now been totally discarded." Have they? If "'tis true 'tis pity," or so it would seem to those of us who have watched the painful pericarditis or pleurisy relieved by leeches.

I am no *laudator temporis acti* but I wish to protest emphatically against throwing away the baby with the bath water.

London, W.1.   CHRISTOPHER HOWARD.

SIR,—In his delightful paper Dr. Forbes makes an earnest plea for definition of terms, with which many of us must be in full sympathy. To show my appreciation in a practical manner, I should like to set the ball rolling towards elucidation of the (now fashionable) term "psychosomatic." Others can then kick it about and eventually it may reach its goal. Meanwhile a good time will be had by all.

It is easier to give a concept of this term than actually to pin it down by a *definition*. My own tentative conception is that it is analogous to the term "electro-magnetic." In an electromagnetic system it is impossible to alter the flow of electricity without altering the magnetic field. Conversely any variation in the magnetic field is at once reflected in the electrical potential. The two are as inseparable as the heads and tails on a coin, being merely different observable aspects of the same phenomenon. In the same way every alteration in the psyche affects the soma, and vice versa, because (and this is the important and difficult point to grasp) they are different but interdependent aspects of the same phenomenon—a living individual. There is no question of mind over matter or matter over mind. Mind and body, psyche and soma, are as inseparable as inside and outside.

It would therefore appear meaningless to refer to "psychosomatic disorders" as though they were certain recognisable diseases in a class of their own, distinct from other diseases. The phrase "psychosomatic medicine" does, however, suggest to me a certain approach to disease and health. It suggests investigating the patient as a whole, accepting the idea that in every condition of life both psyche and soma are affected, and (in practice) treating whichever is handier.

There is nothing new in this. General practitioners have been doing it for centuries. But with the advent of every new specific drug, serum, vaccine, and operation, the emphasis is shifting more and more towards soma and farther from psyche. General medicine (and surgery in particular) is concerning itself increasingly with ridding a patient of the physical handicap of his illness and getting him back to work. Sometimes this is rather like performing highly skilled running repairs on the car, when really it may be the driver who needs attention. Psychosomatic medicine, studying the patient as a whole, would seek to make it unnecessary for him to break down.

Such is my conception, and I am only too eager to revise it if it be found wide of the mark by my betters.

Mundesley. GEORGE DAY.

SIR,—May I congratulate Dr. J. R. Forbes on his paper of August 31? With the possible exception of those relating to fluid-intake, I feel each one of his remarks is most sane and timely. Of paramount importance are his references to the medically induced neurosis. The abysmal ignorance, exhibited by general practitioners and general consultants alike, concerning the ætiology, prevention, and treatment (usually so simple and straightforward) of the common neuroses is one of the most depressing and deplorable aspects of modern medicine. This lack of simple knowledge, fostered and perpetuated as it is by a mental attitude of derision, means that, for every patient cured by the exhibition of one of medicine's modern therapeutic triumphs, at least one (probably more nearly half a dozen) is allowed to sink irretrievably into chronic invalidism and the misery of a life of medically induced or medically perpetuated neurosis.

Port Talbot. R. J. T. WOODLAND.

SIR,—Dr. Forbes has handled a very awkward subject and presented it in a most acceptable and entertaining manner. It has long been my ambition to write a paper on the same subject.

During nine years in charge of the diphtheria wards of a fever hospital I could never convince any of the sisters that lying flat on a hard mattress without a pillow was most uncomfortable, and therefore not restful. I was looked on with horror and told that every school of nursing insisted on cases of diphtheria being kept flat without a pillow for at least three weeks. They simply would not accept the fact that the same absolute rest could be attained more effectively if the patient had a pillow for his head instead of rolling it from side to side on a hard mattress. Yet all the sisters slept with a pillow or two under their heads.

Manchester. J. EGAN.

PENICILLIN BY INHALATION

SIR,—The papers by Dr. Humphrey and Dr. Joules (p. 221), and Dr. Southwell (p. 225) in your issue of August 17, tempt me to record my own short series of observations.

I used a Collison's inhaler and gave five minutes' inhalation every hour from 6 A.M. to 10 P.M. of a solution of penicillin containing 5000 units to the c.cm. Three cases of postoperative bronchopneumonia and 4 of postoperative bronchitis responded most satisfactorily. The bronchopneumonia cases presented dullness and impaired breath sounds with radiological opacities, but had not progressed to the stage of bronchial breathing and bronchophony. A case of postoperative confluent *Staphylococcus aureus* pneumonia did not respond at all, though relieved promptly by parenteral penicillin. I have not cared to try this form of therapy in any other lobar or confluent bronchopneumonia. Four of chronic bronchitis and a comparatively mild bronchiectasis improved in that the sputum from mucopurulent to mucoid and lessened in am though an appreciable quantity remained. A ca postinfluenzal bronchitis and one of a low-grade influenzal bronchopneumonia with mucopurulent sp. believed due to secondary bacterial infection respo promptly and completely; the latter had *not* respo to parenteral penicillin. On the other hand, 2 cas atypical pneumonia considered of virus origin, with serum cold-agglutination titres and plentiful purulent sputum, improved hardly at all. I interested in Humphrey and Joules' observation *Bact. coli* appeared during treatment, as the same occurred in several of my cases.

I have formed the impression that penicillin inhal has a definite rôle to play in the treatment of acce bacterial infection with organisms susceptible to p cillin, with or without underlying pathological condit Underlying conditions such as chronic bronch bronchiectasis, or a still active virus disease re unaffected. I suspect that consolidated lung is inacc sible to penicillin by inhalation.

I am indebted to Air Vice-Marshal A. F. Rook, con in medicine to the R.A.F.M.S., for encouragement assistance in this investigation.

Ely. D. FERRIMAN.

SUPRAPUBIC PROSTATECTOMY

SIR,—In suprapubic prostatectomy with closure, commonly performed, a catheter is passed from t external meatus, through the urethra, into the bladd and then fixed in place. It is a common experi that it often tends to stick in the cavity which has been occupied by the enucleated "prostate." Even india-rubber coudé catheter may so stick. During t last couple of weeks, by borrowing a tip from M McGill, we seem to have overcome this difficulty. McGill's intratracheal tubes were originally made himself from ordinary tubing and given their requ curve by storing the tubes in round tins. We underst they are still so stored. By sterilising catheters, kno as whistle-tipped in England and as McCarthy ela tomes in America, in 2-oz. tobacco tins and leaving th in the tins for a couple of days they acquire a cu which seems to permit them to ride smoothly into t bladder. The 2-oz. tobacco tin can accommodate th 22F catheters.

This procedure is so simple that it is unlikely to original, but it has proved so useful that this note help those who have not heard of it.

Dublin. T. J. D. LANE

FUNICULITIS

SIR,—With reference to Lieut.-Colonel Power's inter ing paper on funiculitis in British troops in Cey (April 20), may I draw his attention to a paper by m published in THE LANCET many years ago (August, 1 on the disease I called "endemic funiculitis"? A fu complete description of it with four illustrations m found in Castellani and Chalmers *Manual of Tr Medicine* (3rd ed., p. 1939), in which, in addition t acute type, mention is made of a mild form with thr bosis of the veins, without suppuration. To this la type, I feel, belong Lieut.-Colonel Power's cases.

What is the ætiology of endemic funiculitis? In my Ceylon cases I found a virulent streptococcus; some of them there was also a filarial infection. I believe that the streptococcus plays by far the important ætiological rôle, and that the condition arise also when there is no concomitant filarial infecti At any rate even if the syndrome should be consid of filarial origin, it is clinically so characteristic that deserves being given a full description and not dismis in a few words, as is done in so many books on trop medicine. It must be kept in mind that the acute is a very serious disease and is of great practi importance, since often, if the correct diagnosis is made in time and the appropriate treatment not gi immediately, a general streptococcal infection devel with grave risk to the patient's life.

Sintra, Portugal.

ILDREN WHO SPEND TOO LONG IN BED

r,—Dr. McCluskie's stimulating article of August 31 welcome addition to the growing body of common- advice about infant and child care. Hardly a e criticism he has made could not be illustrated from y cases known to any G.P. Most illustrative, aps. of a typically "successful" parental domination ie child of 3 that "lay from 6 A.M. until 8 A.M. wet bed playing with the blankets." It is this rmination to "train" the unfortunate babe, from moment of its arrival, for the convenience of its nts' pre-existing habits that has such lamentable hological results. Instead of making an attempt ompromise, the parents endeavour (fortunately often out success) to mould the child hourly into their own t groove.

hus, many modern maternity nurses teach mothers eave their baby to cry, whatever their maternal incts. between the rigidly set feeding times: how h this tends to destroy the rapport between mother child is clear to see. I have known mothers to sit nised, in obedience to this teaching, watching the k creep round from 5.15 to 5.30, 5.45, before guiltily ing up the baby ten minutes early for its 6 o'clock , for a little overdue mother-love.

ne could cite such things ad nauseam—the rigidly sured feeds. to be taken each time. never an ounce e left, nor an ounce extra given: the agony of the kly weight figures if there is a week's stasis: the iety if an 18-monther soils his trousers. In brief. the lern mother is invited to consider her baby as nothing e than a machine, requiring mathematical precision reatment and nothing else.

great deal of the fashionable "training" seems to essentially at ensuring the minimal disturbance of t domestic routine which existed before the arrival he first child. without due regard for the child itself. o main themes of our instruction to mothers should ely be these: (1) A frank admission that parenthood ans unselfishness and "giving out." especially of e and individual understanding; at the least striking air balance between needs of parent and child. and her erring on the side of "putting the children first" unfashionable phrase today) than dominating them parental convenience. (2) While setting out the essary feeding time-table, principles of child care and nagement, &c.. we should insist that the mother ognises that they are *only for guidance*. and not to slavishly adhered to like a railway time-table or legal le. Child psychologists would find their work lightened the parents could be educated to ignore the "baby a machine" school of management, and to rely on eir own instincts and judgment in solving individual blems.

reenhithe, Kent. G. F. TRIPP.

SIR,—My article—which incidentally is quite unworthy the publicity it has received—does not describe a ime-table" for infants and toddlers but a "plan" on ich to base a time-table. It states quite plainly that each child as he develops will soon give his mother an lication of how much day-sleep he requires" if the an is followed. Rigid time-tables create an obsessive nd in both the mother and the child. and too much phasis cannot be laid on the part played by mother- e in the successful handling of a child.

The individual variation suggested by me is not 30 nutes but an hour, or more. or less. (Approximately minutes is the time named. but some mothers may d it necessary to add; others to subtract.) Neverthe- s. having regard to Professor Bühler's table of actual servations, which were timed not to the nearest half- ur but to the nearest second. this variation may be large. I understand some American physicians are rrying out stop-watch nursery recordings and I await eir results with interest.

Between the fifth and the tenth months an infant o sleeps too long in the mornings becomes cross in the ernoons because he cannot sleep. It is easy for a other to prevent an infant sleeping too long in the orning and so gain the benefit of the afternoon rest d no crossness.

From years of experience with children I find that the lthy child of three years at home begins to prefer all his sleep in one dose. But there is no harm in routine day-sleep above this age provided always (*a*) the length of the day-sleep is related to and not in competition with the night-sleep, and (*b*) that it is the child's physiology and not the teacher's boredom that calls for it. Where there are two or more children who can play outside, day-sleeps can be tiring and exhausting for the mother. because they involve undressing. re-dressing. and remaking of beds. (The practice of putting children to bed during the day with their clothes on is a bad one because it causes overheating of the skin and sometimes sweating.)

"Rounds of pottings," indeed! I have 3 children under six years who have never had a routine "round of potting" in their lives because they go to bed to sleep, not to be taught bad habits.

There is too little respect for genuine motherhood in Britain and too much kow-towing to a nation-strangling matriarchy.

Westcliff-on-Sea. JOHN A. MCCLUSKIE.

FAVUS IN DEVON

SIR,—Whether it be due to an influx from elsewhere or to an indigenous source of infection, there is some evidence of an outbreak of favus in North Devon. Scutula are not always easy to find, nor are the nails often affected, but with Wood's glass, a hand lens, and a microscope the infected hairs on the scalp, tiny crusts surrounding hairs, and incipient bald patches can be noted. Ringed lesions. from which the crusts have been removed by treatment, have led to the diagnosis of "ringworm" of the glabrous skin.

Exeter. H. W. ALLEN.

EFFECT OF PHOSPHATE ON CARBOHYDRATE ABSORPTION IN SPRUE

SIR,—In our preliminary communication (*Lancet*, 1945, ii. 635) we reported experimental evidence that in active sprue there may be "a failure of the phosphorylation of glucose at the time of its absorption." It was our intention to continue our researches and publish the results in detail later, but unfortunately (or fortunately?) the cases suitable for experiment have been too few to provide anything more than indications of the direction in which future research should be developed. For the benefit of others who are more favourably placed for doing experimental work, it seems worth while recording our results of the effects of adding phosphate to carbohydrate solutions administered to cases of active sprue.

In our first experiment a case of active sprue with characteristic history of loss of weight, flatulent dyspepsia, and glossitis was selected and placed on a simple milk diet. An oral sucrose-tolerance test was carried out and the usual flat glucose and normal fructose absorption curves obtained. To confirm that the flat glucose curve did not arise from hold up of the sugar in the stomach, the test was repeated, the sugar solution being injected by tube direct into the duodenum. The resulting glucose-absorption curve was again flat and the fructose normal. Glucose was next injected intravenously, and. as Fairley has found in other cases of sprue, the curve of disappearance of the sugar from the blood was within normal limits.

It was clear that in this case the flat glucose curve was due neither to delayed stomach emptying nor to rapid removal of the sugar from the blood. and was therefore presumably due to failure of absorption. We decided to investigate this failure of absorption by studying the points at which the complicated process of phosphorylation might fail. The accessibility of the phosphate ion was investigated first. We argued that if the phosphate were unavailable because it was absent (which was unlikely on a milk diet) or because it was present in some inaccessible form, then phosphorylation should be restored by the exhibition of the phosphate ion. We therefore repeated the sucrose-tolerance test, administering the sugar (100 g.) direct into the duodenum and adding to it 8 g. of a mixture of potassium acid phosphate and disodium phosphate buffered at pH 7·0. The result was startling. The glucose curve was now normal. the fructose curve remaining unchanged. A week later the sucrose test was repeated without phosphate and the resulting glucose curve was again characteristically flat, the fructose remaining normal. Some time later the sucrose test plus phosphate was repeated by mouth and again a normal glucose curve was obtained. The relevant figures obtained in these experiments are given below:

DUODENAL ADMINISTRATION OF SUCROSE (100 G.)

Time (hr.)	Dec. 12, 1945 (no phosphate) Glucose	Dec. 12, 1945 (no phosphate) Fructose	Dec. 19, 1945 (8 g. phosphate mixture) Glucose	Dec. 19, 1945 (8 g. phosphate mixture) Fructose
	mg. per 100 c.cm.		mg. per 100 c.cm.	
0	90	0	60	0
$^1/_2$	70	15·3	153	7·0
1	76	15·7	114	10·0
$1^1/_2$	70	10·3	55	7·9
2	82	8·4	51	7·0
$2^1/_2$	80	6·0	62	5·2

We have repeated these experiments in a modified way on 3 other cases of sprue, none of which was, however, in a very active stage of the disease. In 2 of these cases the phosphate appeared to assist the absorption of glucose; in 1 it had no effect.

These results are offered in letter form because they are so incomplete and because we are unable to go on with the work owing to lack of cases. I think the results show that in some cases of sprue at any rate the failure of absorption of glucose is connected with failure of phosphorylation of the hexose arising from an apparent inaccessibility of the phosphate ion. In other cases the complicated mechanism of phosphorylation may have broken down elsewhere.

In cases in which the absorption of glucose is restored to normal in the presence of the phosphate ion, the latter might prove a valuable therapeutic agent.

School of Tropical Medicine, University of Liverpool. BRIAN MAEGRAITH.

PERSISTENT ENURESIS

SIR,—Neither Stalker and Band's paper[1] nor your annotation on it (August 17, p. 243) mentions the possibility of endocrine treatment of enuresis, although evidence is available that points to a definite influence of the sex hormones on the urinary system and also, to some extent, on disorders of micturition.

The close developmental and anatomical connexion between the genital and the urinary system provides a basis for understanding a possible action of the sex hormones on the urinary tract. Œstrogens in large doses have occasionally produced bladder distension and hydronephrosis in male and female mice.[2] There is reason to assume that the ureteral dilatation which frequently occurs in women during early pregnancy is due to œstrogenic action and not to mechanical obstruction, for which no evidence exists. Urinary symptoms, such as frequency, urgency, and incontinence, are often encountered in menopausal women and respond remarkably well to œstrogen treatment.[3]

Androgens produce hypertrophy of the urethra in males and females and possess nephrotrophic properties; testosterone produces a true parenchymatous hypertrophy, principally of the cells of the renal tubules. This hormone has also been shown to increase the tonus of the bladder. *Intravesical pressure after introduction of* increasing amounts of fluid is higher after treatment; the maximal pressure which can be tolerated without pain and the pressure at which desire to urinate is experienced are increased.[4] Everybody who has used androgens in the treatment of prostatism knows that, though it is without influence on prostatic enlargement, the distressing symptoms associated with micturition improve. The size of the urinary stream increases, and the tonus of the detrusor and probably of the sphincter muscles is augmented (cf. Egger[5]). Greenblatt[6] treated 34 women suffering from nocturia, frequency, and incontinence with testosterone parenterally, by mouth, and by pellet implantation. His results were good, in cases with fibroids where orthodox teaching t attribute nocturia to mechanical pressure. St Band have stressed the point that nocturnal and d frequency, urgency, and sometimes diurnal enuresis be associated with enuresis nocturna.

Enuresis in children has been treated by Hoff with urinary gonadotrophins, and he claimed suc Testosterone propionate was used by Zehn,[8] who in 5 mg. for a short period daily, then every third or f day, and claimed excellent results. Schlutz and A son[9] treated 50 children, 36 boys and 14 girls, bet the ages of $3^1/_2$ and 14 years with daily injections 25 mg.), inunction, or oral application of male hor 54% were cured, 34% much improved, 12% rem unaffected within 2 months. The authors think failures were partly due to irregular medication. In cases the effect was dramatic but one case required ment for a year. No undesirable effects were prod relapses occurred but resumption of treatment w followed by response. Treatment was combined fluid restriction, high salt intake, and getting the up once in the early part of the night. Most cases on this management for some time but did not impr before hormone treatment was instituted.

I have treated a small number of cases with testosterone in doses of 5–10 mg. per day, some comb with inunction of testosterone ointment on the part of the abdomen. The number is too small to all conclusions but all seemed to respond. One boy 14 years has been symptom-free for the last 9 mont In all cases treatment had to be continued for sev months; larger doses or parenteral application mi have produced results in a shorter time. No untow side-effects were encountered. It may be mentioned th two of the children had radiological abnormalities the first sacral vertebra.

Without underrating the complexity of the pr of enuresis, I believe that androgen treatment is enough to be tried on a larger scale, and that, on t strength of the published data and my own observat results may be expected in a certain proportion of c To establish the value of this therapy definitely an eliminate psychological factors which may easily in the response to any treatment in enuresis, control c will be needed who are treated with an inert subst

London, W.1. H. Uc

SUPPLEMENTARY FOOD FOR PREMATURE INFANTS

SIR,—Many will have read with interest the ar by Jorpes, Magnusson, and Wretlind (August 17), s forth the results they obtained by giving pr infants breast milk supplemented with casein hy lysate and glucose. I hope the writers will give us further details. For example, did the control ba who had breast milk only receive the same total ca intake as the "treated" infants, or was the amo glucose given as an extra? Have they evidence the effect of giving hydrolysate on neonatal mort or on the development of infants by, say, 6 mo of age?

If I am correct in understanding that the amino glucose was an extra, it would seem that the contro on breast milk alone, received at first "minimal requirements for life," and later an average of calories per kg. (45 calories per lb.), daily, whereas infants with the supplement received over and ab this allowance nearly 20 calories per kg. extra. If t were so, might not the improved gains of babies recei the hydrolysate be due simply to their improved ca intake? Since a casein supplement might be po tolerated by a premature infant, the deficient incre in weight in the group given casein would not dispr this suggestion. The increases in weight of Pro Magnusson's controls, on breast milk alone, are le than those I am in the habit of seeing among premat infants born and supervised in a maternity hosp and given a more liberal calorie intake (*Arch. Dis. Chi* 1941, 16, 166). These babies are fed on breast mil

---

[1] Stalker, H., Band, D. *J. ment. Sci.* 1946, **92**, 324.
[2] Lacassagne, A. *C.R. Soc. Biol. Paris*, 1933, **113**, 590.
[3] Salmon, U. J., Walters, R. I., Geist, S. H. *Amer. J. Obstet. Gynec.* 1941, **42**, 845.
[4] Muellner, S. R., Hamilton, J. B. *J. Urol.* 1944, **52**, 139.
[5] Egger, K. *Schweiz. med. Wschr.* 1944, **74**, 676.
[6] Greenblatt, R. B. Office Endocrinology, Springfield, Ill. 1944, p. 68.
[7] Hoffmann, F. *Arch. Gynäk.* 1938, **166** 240.
[8] Zehn, P. *Dtsch. med. Wschr.* 1939, **65**, 1831.
[9] Schlutz, F. W., Anderson, C. B. *J. clin. Endocrin.* 1943, **3**,

possible, supplemented as necessary, when this
hort, with half-cream dried milk and sugar, or with
nsed milk. They usually gain weight at a rate
ferior to their full-term fellows—i.e., about 5–7 oz.
y or 25 g. daily after the first week of life, which was
ximately the rate of gain of the babies given
sol. There are undoubtedly wide differences of
n as to the level of calorie intake conducing to
owest mortality-rates among young premature
s, but there is no doubt that gains are likely to be
vely small if the daily calorie intake is kept as low
calories per lb. body-weight.

e Swedish workers comment that doses of hydro-
e larger than those they advocate often caused
ting or regurgitation of food—and I too have
ntered difficulties when giving casein hydrolysate—
at it behoves those who try this supplement to use
h caution. If it should turn out that the important
of the hydrolysate supplement was that it provided
calories, then an increase in the breast-milk
ance may still prove preferable. Perhaps Professor
usson can clear up some of these points and correct
I have misunderstood.

don, N.W.3. HELEN M. M. MACKAY.

A SYNDROME SIMULATING ACUTE ABDOMINAL DISEASE

,—When I read the interesting description of their
rome by Mr. Goldstone and Dr. Le Marquand
ust 24) I was puzzled by the omission of Bornholm
se from the differential diagnosis. Neither does
ram mention it in his letter of Sept. 7.

attention was first drawn to this disease some years
by Dr. W. N. Pickles but I saw no examples of it
I was posted to Naples last May. Reference to these
nts has been made in your columns by Reynell
ect, 1946, i, 977) following Scadding's description of
s in the Middle East (*Ibid*, p. 763). Meyer also wrote
t cases in C.M.F. (*Ibid*, p. 902), while Martindale
ribed an outbreak on a frigate in the Indian ocean
l, p. 834).

oldstone and Le Marquand ask three questions:
"Why does it develop on the right side only?"
lemic diaphragmatic myalgia occurs on either side,
the authors discuss the condition in reference to the
ute abdomen," and, as Scadding points out, abdo-
al signs are predominantly right-sided. The pain
ally is often central or bilateral, but abdominal
lerness is usually only found under the right costal
gin. Pressure there may produce in addition pain
e shoulder or neck. Presumably the upward pressure
he liver is transmitted to the diaphragm. Further-
e, on seeing a patient with pain on the left side, one's
ntion does not immediately descend to the appendix
gall-bladder, as it naturally does when pain is on the
t. The picture with involvement of the left side
e resembles that of acute dry pleurisy, and does not
eadily attract surgical attention.

"Why does it develop so often in West Africa,
rarely in U.K.?" This is an epidemic condition.
may wait for years without seeing it, in the U.K.,
taly, or in W. Africa, and then suddenly it is common.

"Might the syndrome be due to an unusual type
epidemic?" Speaking from the armchair, my
er is "yes."

he authors suggest that the cause may be perinephric
hylococcal infection. Four of the thirteen patients
had boils. Is this surprising in European Servicemen
. Africa? Four had preliminary periods of malaise.
his unusual in patients admitted with other acute
sses? One of the authors' patients developed a right
nephric abscess. One of mine had a right apical
erculous cavity but this does not make the rest
erculous.

r. Oram suggests that latent or subclinical infective
atitis may possibly produce such symptoms. I do
think so, for I saw a lot of infective hepatitis in Africa
Italy from 1942 to 1946, but did not see patients with
e devil's grip" until this year. There was none in
n while I was there; a few days later I saw examples
aples; yet infective hepatitis was common in both
es.

ckfield, Sussex. PHILIP EVANS.

NUTRITIONAL OPTIC NEUROPATHY

SIR,—The article by Dr. Fitzgerald Moore in your issue of August 17 is of such interest to me that I would like to make some observations on it.

The first real recognition of the syndrome of epithelial and nervous lesions complicated by nutritional optic neuropathy was by H. Strachan,[1] in 1897; I referred to his work in my privately printed paper[2] which Moore mentions.

Strachan in 1888 drew attention to a form of multiple neuritis prevalent in the West Indies. By 1897 he was convinced he was seeing an unrecorded form of neuritis, and stated that its chief features were: "(1) A more or less widespread neuritis, involving some of the nerves of special sense, especially the optic nerve. (2) The occurrence of trophic changes in the skin along the distribution of the nerve terminations, in the muscles, in the mucocutaneous lines, and occasionally in the cornea. (3) The rare but still to be noted occurrence of monoplegias. (4) The fact that the disease may be very severe, lasting for many months or even years. (5) The fact that recovery is the rule and a fatal termination very rare. (6) That it attacks many hundreds of persons, at least in Jamaica, the great majority of these being black or coloured inhabitants, who constitute the bulk of the population, though the white residents are not exempt by any means."

Strachan next detailed some of the most important signs and symptoms and described paræsthesias and gradually increasing impairment of vision, but noted that recovery of sight was the rule and optic atrophy never resulted. He also referred to "the condition of the mucocutaneous orifices" and said: "This demands some little notice as redness and irritation of the eyelids and lips are often the first signs noticed. It soon passes into a slight eczematous condition, especially at the corners of the mouth and round the margin of the nostrils, with fine branny desquamation. A similar condition in the mucocutaneous line in the prepuce is not uncommon. More rarely there is a similar condition of vulva and anus. The lips and inside of the mouth are hyperæmic and there may be much loss of surface epithelium on the tongue."

It is of great interest that Strachan recorded pigmentation of the palms of the hands and soles of the feet. Sensation was blunted and in grave cases involvement of the innervation of the heart and diaphragm led to death. He saw mental involvement only in two or three cases but said such cases could be found in asylums. There is little doubt that he was seeing cases of beriberi and pellagra as well as the syndrome under discussion, but his treatment was nevertheless correct, and consisted in rest in bed and nourishing food gradually increasing in quantity and variety throughout the early and acute stages. Medicinal treatment was given for the malaria believed to be present, and iodides to promote absorption of the inflammatory material in the affected nerves.

Moore says the condition I described in 1928[3] was identical with that described by Stannus. This is not so. I found defective vision a cause of constant complaint, whereas Stannus[4] records finding only 5 patients with defective vision out of a total of 131, which means there is no conclusive evidence of defective vision in his report. Moore still makes it appear that I first attributed the Sierra Leone disease to avitaminosis in 1930; but it was in 1927 that I attributed it to A and B deficiency[5] and it was then that I introduced the "active treatment" with yeast and cod-liver oil.

Recently Hobbs and Forbes[6] referred to the prophylactic value of first-class protein in nutritional visual defects, and it is interesting to recall that Clark,[7] who investigated the syndrome of epithelial and nervous lesions in Nigeria, concluded that cyanogenic foodstuffs,

---

1. Strachan, H. *Practitioner*, 1897, 59, 477.
2. Wright, E. J. The A and B Avitaminosis of Sierra Leone. Reprinted from J. N. Leitch's Dietetics in Warm Climates, London, 1930.
3. Wright, E. J. *West Afr. med. J.* 1928, 2, 127.
4. Stannus, H. S. *Trans. R. Soc. trop. Med. Hyg.* 1913, 7, 32.
5. Wright, E. J. Ann. Medical and Sanitary Report for Sierra Leone, 1927, p. 29.
6. Hobbs, H. E., Forbes, F. A. *Lancet*, August 3, 1946, p. 149.
7. Clark, A. *J. trop. Med. Hyg.* 1936, 39, 269.

Medical Women's Federation

The London Association of the federation is to hold an evening reception for the council and delegates of the Medical Women's International Association, which is meeting in London this month; the reception will be held at the London School of Medicine for Women, 8, Hunter Street, W.C.1, on Thursday, Sept. 19, from 8 to 10 P.M. The London Association's annual general meeting will be held at B.M.A. House, Tavistock Square, W.C.1, on Tuesday, Sept. 24, at 8.30 P.M.; Dr. Henriette A. Lohr (Amsterdam) will speak on Medicine in Holland under German Occupation.

Lectures on Child Development

The Provisional National Council for Mental Health is holding ten weekly lectures on this subject, beginning on Wednesday, Oct. 9. The lectures are intended for school medical officers; the first will be given by Dr. Kenneth Soddy, director of the council, and the others by Miss R. Thomas, educational psychologist. They will be held at 39, Queen Anne Street, London, W.1, and further particulars may be had from the educational secretary of the council at that address.

Iraq Appointment

Lieut.-Colonel W. R. M. Drew has been appointed professor of medicine at the Royal College of Medicine, Bagdad, in succession to Sir Harry Sinderson.

Lieut.-Colonel Drew, who is 38 years of age, graduated B.SC. at Sydney in 1929 and M.B. in 1930. He joined the R.A.M.C. in 1931, and served in India from 1932 to 1937, except for a period as house-physician at the British Postgraduate Medical School in 1935. In 1938 he became a M.R.C.P., and in 1939 obtained the D.T.M. & H. He returned to the Postgraduate Medical School as clinical tutor, but on the outbreak of war joined the B.E.F., being awarded the O.B.E. after the evacuation from Dunkirk. Since 1942 he has been *responsible for the teaching of tropical medicine at the Royal Army* Medical College, Millbank, and for the last two years he has been joint hon. secretary (with Dr. N. Hamilton Fairley, F.R.S.) of the Royal Society of Tropical Medicine and Hygiene. He was elected F.R.C.P. in 1945. His published work includes studies of primary atypical pneumonia, the toxicity of mepacrine, and sprue.

Royal Sanitary Institute

Dr. F. T. H. Wood, medical officer of health for Bootle, has been elected chairman of the council of the institute.

Births, Marriages, and Deaths

BIRTHS

AHERN.—On August 5, at Graz, Austria, the wife of Colonel T. M. Ahern, O.B.E., R.A.M.C.—a daughter.

BARNSLEY.—On Sept. 1, at Shorncliffe, Kent, the wife of Dr. Alan Barnsley—a son.

CHILD.—On Sept. 5, at Oxford, the wife of Dr. J. P. Child—a son.

DOVE.—On Sept. 3, at Liverpool, the wife of Dr. W. L. Dove—a son.

FLACK.—On Sept. 5, the wife of Dr. I. Harvey Flack—a son.

GOULSTON.—On Sept. 3, in London, the wife of Dr. S. J. M. Goulston, M.C., M.R.C.P., of Sydney—a daughter.

HAYWARD.—On August 31, at Cardiff, the wife of Dr. J. J. Hayward—a daughter.

LEITH.—On Sept. 1, the wife of Dr. W. F. Leith—a daughter.

MACLURE.—On Sept. 4, at Kamakwie, Sierra Leone, the wife of Dr. H. L. Maclure—a son.

NORMAN.—On Sept. 4, at Llandrindod Wells, the wife of Lieutenant Thomas Norman, R.A.M.C.—a son.

PARSONS-SMITH.—On August 31, at Caterham, the wife of Dr. Gerald Parsons-Smith—a son.

PICKARD.—On August 31, the wife of Dr. H. M. Pickard, of Endeleigh Court, London, W.C.1—a daughter.

SAUNDERS.—On August 30, at Barnstaple, the wife of Mr. K. G. W. Saunders, O.B.E., F.R.C.S.E.—a son.

SCOTT.—On Sept. 2, at Malvern, the wife of Dr. G. S. Scott—a son.

STANLEY.—On Sept. 5, at Portsmouth, the wife of Mr. B. E. C. Stanley, F.R.C.S.—a daughter.

WATSON.—On Sept. 5, the wife of Dr. G. I. Watson, of Vachery Shere—a son.

MARRIAGES

BRAINES—STONE.—On August 26, in Guernsey, Frederick Morley Braines, M.B. Lond., to Beryl Winifred Stone.

HODGKIN—CANDLER.—On Sept. 4, at Clyst St. George, Devon, George Keith Hodgkin, B.M., to Rosemary Candler.

MACALEVEY—ALLPORT.—On July 20, at Singapore, Gerald Esmond MacAlevey, C.B.E., D.S.O., M.C., *brigadier* R.A.M.C., *to* Hilda Mary Allport, Q.A.I.M.N.S.R.

TAYLOR—LYNE.—On Sept. 6, in London, John Henry Taylor, M.R.C.S., to Joyce Winefred Lyne.

TOW—CARROTT.—On Sept. 5, Peter Macdonald Tow, M.B., of Wickford, Essex, to Evelyn Mary Carrott.

WILSON—IVOR EVANS.—On Sept. 4, at Swansea, Peter Remington Wilson, M.R.C.S., to Joan Ivor Evans.

DEATHS

BENNETT.—On Sept. 2, in Manchester, Christopher Henry Wentworth Bennett, M.R.C.S., of Sandbach.

BETTS.—On Sept. 1, at Kingsdown, Deal, Alfred John Vernon Betts, M.B. Lond., *lieut.-colonel* I.M.S., aged 72.

MACPHERSON.—On Sept. 5, at Oxford, Alexander Hill Macpherson, L.R.C.P.E.

Medical Diary

SEPT. 15 TO 21

Monday, 16th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. J. Kirk: Anterior Abdominal Wall.
5 P.M. Dr. David Slome: Water Balance in Health and D

Tuesday, 17th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. J. Kirk: Posterior Abdominal Wall.
5 P.M. Dr. David Slome: Water Balance in Health and D

Wednesday, 18th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. J. Kirk: Pelvic Wall.
5 P.M. Dr. E. P. Sharpey-Schafer: Hæmorrhage.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. W. O. G. T Ætiology and Treatment of Paralytic Squint.

Thursday, 19th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Davies: Conducting System of the Hear
5 P.M. Prof. Samson Wright: Physiological Neuronograp
EDINBURGH POSTGRADUATE LECTURES
4.30 P.M. (*Royal Infirmary.*) *Dr. H. L. Wallace: Care o* Small Premature Infant.

Friday, 20th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Wood Jones: Development and Structu the Palate.
5 P.M. Prof. Samson Wright: Physiological Neuronography
TUBERCULOSIS ASSOCIATION, 26 Portland Place, W.1
3.15 P.M. Dr. Honor Smith: Clinical and Pathological A of Tuberculosis of the C.N.S.
5 P.M. Dr. G. B. Dowling: Treatment of Lupus Vul *Dr. D. E. Macrae: Use of Calciferol in* Tuberc Conditions.

Appointments

ADKINS, G. E., M.B. Camb.: tuberculosis officer, Exeter Di Devon.

DARLOW, A. R., M.R.C.S.: M.O., Uganda (colonial service).

EASTON, I. D., O.B.E., M.B. Edin., F.R.C.P.E.: specialist cons physician, Perth Royal Infirmary.

HORNE, W. A., M.D. Glasg., D.P.H.: senior deputy M.O.H., Gl

ROBERTS, LLYWELYN, M.D.(Hyg.) Lond., M.R.C.P., D.P.H.: M.O.H., Sheffield.

RUSSELL, P. M. G., M.B. Lond., F.R.C.S., M.R.C.O.G.: surg charge of obstetric gynæcological dept., Royal Devon and E Hospital.

SEARLE, P. W. J., M.B. Brist.: M.O., Fiji (colonial service).

Glasgow Royal Infirmary:

BEATTIE, WILLIAM, M.B. Glasg., F.R.F.P.S.: asst. surgeon.
FLEMING, CHRISTIAN M., M.D. Glasg., F.R.F.P.S.: asst. phy
IMRIE, A. H., M.B. Glasg., M.R.C.P., F.R.F.P.S.: asst. physic
INNES, A. J., M.B. Edin., F.R.C.S.: asst. surgeon, orthopædic
JARVIE, JAMES, M.B. Glasg., F.R.F.P.S.: asst. surgeon.
McDOUGALL, ARCHIBALD, M.B. Glasg., F.R.F.P.S.: asst. sur orthopædic dept.
RAESIDE, DAVID, M.B. Glasg., D.M.R.: third asst. radiologi
SHORT, D. W., M.B. Glasg.: asst. surgeon, orthopædic dept.
YOUNG, STEPHEN, M.B. Glasg.: surgeon, E.N.T. dept.

Royal Infirmary, Bradford:

Full-time—
CAMPBELL, R. J. C., M.B. Edin., D.M.R.: radiologist.
CARR, R. J., M.D. Durh., D.M.R.: radiologist.
KELLETT, H. S., M.B. Camb., D.C.P.: pathologist.
LEWIS, R. I., M.D. Lond., D.M.R.E.: radiologist.
Visiting—
BENSON, JOHN, M.B. Leeds, F.R.C.S.E.: ophthalmologist.
DAVIDSON, C. L., M.D., B.CH.D. Leeds, M.R.C.P., D.C.H.: physician.
DAVIDSON, J. S., M.B. Edin., F.R.C.S.E.: asst. surgeon.
DAWSON, JAMES, M.B. Glasg., F.R.C.S.: surgeon.
DICK, I. L., M.D. Edin., F.R.C.S.E.: orthopædic surgeon.
LANGLEY, R. L., M.D. Edin., M.R.C.P.E.: pædiatrician.
LLOYD, R. I. T., M.B. Leeds, F.R.C.S.: ophthalmologist.
MARTIN, F. R. R., M.B. Camb., F.R.C.S.: asst. surgeon.
NAYLOR, ARTHUR, CH.M. Sheff., F.R.C.S.: orthopædic surge
OTTY, J. H., M.B. Aberd., F.R.C.S.E., D.L.O.: E.N.T. surgeon.
PRICE, J. A., M.D. Belf., M.R.C.P.: physician.
SMITH, L. W., M.B. Camb., M.R.C.P.: asst. physician.
WATSON, G. W., M.B. Edin., F.R.C.S.E.: surgeon.

Examining Surgeons under Factories Act, 1937:

BYRNE, P. S., M.B. Lpool: Milnthorpe, Westmorland.
CARAHER, F. A., L.R.C.P.I.: Carnforth, Lancaster.
HEAP, G. M., M.R.C.S.: Rochdale, Lancaster.
WEBSTER, F. J. D., M.B. Leeds: Bridlington, York.
WHITE, J. A., M.B. Glasg.: Saltcoats, Ayr.

THE Central Medical War Committee announces that following have resumed civilian practice:

Mr. BRYAN MURLESS, F.R.C.S., M.R.C.O.G., 808, Acutts Ar Durban, S. Africa.

Mr. R. W. NEVIN, F.R.C.S., 53, *Harley Street, W.1.* (Tel. Lan 1077.)

ENICILLIN IN WOUND EXUDATES

I. E. FLOREY
M.B. Adelaide
CH CLINICAL ASSISTANT

E. C. TURTON
M.B. Lond., M.R.C.P.
REGISTRAR

CLIFFE PENICILLIN UNIT OF THE MEDICAL RESEARCH COUNCIL

E. S. DUTHIE*
M.B. Dubl.
NSTRATOR IN PATHOLOGY, UNIVERSITY OF OXFORD,
AT SIR WILLIAM DUNN SCHOOL OF PATHOLOGY

: routine prophylactic use, in severe battle
lties, of intramuscular doses of penicillin prompted
vestigation into the penicillin content of wound
tes after 100,000 units, the recommended initial
It was hoped to determine whether such a dose
l be followed by exudation of the drug into a wound,
vhether it would remain longer there than in the
-stream, thus exercising a protective effect during
periods in transit, in which no injections were
. When this time-limit was found, the same
vas placed locally in the wounds, and the duration
rotective concentration in blood and wound exudate
ing each method of administration was compared.

METHODS

udates were first collected from 22 lacerated wounds
rborne battle casualties at the first removal of
ngs in the Radcliffe Penicillin Unit, and at different
rals following the immediate administration of
00 units of penicillin.

ing to circumstances over which the Unit had no
ol, the supply of fresh cases ceased after three
hs, and so, as the experiments continued and the
wounds had to be used, the age of the latter
ased until the last one was 67 days old. The
diate effects of trauma, therefore, could only have
ed an influence on the earlier results. Intramuscular
nistration was investigated before local when
itions more nearly approached those for which this
od of prophylaxis had in fact been used.

llection was usually by means of a Pasteur pipette,
a rubber drainage-tube was used on one occasion
glass tube on five occasions. When collection took
than a few minutes, the collecting vessel was
unded with ice.

says of blood and urine were also carried out to
tain if there was any correlation between penicillin
entration in the three fluids.

e method of assay used for low concentrations either
e blood-stream or wound exudate was Heatley's
-on-slide method (Garrod and Heatley 1944). For
and wound exudate, when enough was collected
when the presence of more than 0·1 unit per c.cm.
l be expected, the cylinder-plate method (Heatley
) was used. To make the test more delicate, the
s were seeded with a 1 : 1000 dilution of broth culture
e test staphylococcus (N.C.T.C. no. 6571).

ntrols were obtained for wound-exudate samples
e addition of penicillinase or by using those collected
ng after the last administration that they were free
nicillin.

fficulties in Interpretation.—The reading of slide
was made difficult in centrifuged exudates by the
ent presence of contaminating bacteria. To exclude
readings from inhibition of the test staphylococcus
e contaminants, a series of tests was set up in which
n was inoculated with the test staphylococcus and
one of six varieties of gram-negative bacteria
red from the wounds. Various dilutions of
nsions of the contaminants were used for inocula-
Though they prevented the typical appearance of discrete colonies, microscopical examination always revealed a free though more diffuse growth of staphylococci in the presence of *Ps. pyocyanea* and *Bact. coli*. In the presence of proteus, growth though less abundant took place in every concentration used.

The greatest problem to be overcome, however, was the presence of some inhibitory factor, or factors, other than penicillin in the exudate. Nine wound exudates inhibited the test staphylococcus even when incubated with penicillinase; so their assays are excluded from the tables. Considerable efforts were made to eliminate this factor and to find its source. It was not produced by the gram-negative bacteria infesting nearly all the wounds, nor was it associated with rubber tubing or its preservative. Moreover, it appeared in a sterile serous exudate after it had been incubated for three hours.

Extraction.—Eventually a method of extraction was developed which ensured that penicillin alone was assayed. It depended on the use of ammonium sulphate, of high pH, to precipitate the globulins, and of amyl acetate and phosphate buffer for the actual extraction. To reduce penicillin loss, samples were kept, from the time of collection till the final extraction, in a beaker containing ice, only being removed when centrifuged or shaken. The method was as follows:

(1) The samples were centrifuged until a comparatively clear supernatant fluid appeared.
(2) This was removed with a pipette and diluted if necessary with saline, to make a minimum of 0·4 c.cm.
(3) Ammonium sulphate, equal by weight in grammes to half the volume in c.cm. of the sample from (2), was added and the mixture well shaken.
(4) It was centrifuged at 4500 rev. per min. for about 20 min.—i.e., until there was a sufficiency of clear supernatant fluid to use in the next steps.
(5) A volume of amyl acetate equal to that of an aliquot of the supernatant fluid was added.
(6) During gradual acidification to pH 2·0 with N/3 HCl † persistent shaking was carried out to prevent destruction by the acid before extraction had taken place.
(7) The supernatant amyl acetate was separated and removed.
(8) An equal volume of M/15 sterile phosphate buffer at pH 7 was added to the amyl acetate and shaken well.
(9) After centrifuging, the phosphate layer was removed for penicillin assay.

When slide tests were used, twofold dilutions were made with sterile serum. A fraction of serum was added to the first undiluted drop, as staphylococci did not grow in the phosphate buffer solution only. The lowest reading was equivalent to a little over 0·02 unit per c.cm. In the cylinder-plate test, undiluted buffer solution and tenfold dilutions were set up, so that, with the plates seeded with a 1/1000 dilution of the test culture, the lowest reading obtainable was 0·1 unit.

PENICILLIN LEVELS FOLLOWING INTRAMUSCULAR INJECTION OF 100,000 UNITS

All cases had received some kind of prophylactic penicillin therapy in transit, but none had been given any in the 24 hours preceding each experiment, nor was the last dose greater than 50,000 units. In eight instances the assays were done on patients within the first week of wounding, but the wounds of the remainder were considerably older.

The results in 11 cases are recorded in table I. Though cases whose wound-exudate controls did not conform to the standard mentioned earlier are excluded, their blood and urinary assays served to confirm the findings in those described. It will be seen that, irrespective of the age, types of bacteria, or pH of the wound, in every case there was a detectable amount of penicillin in the exudate up to 8 hours after injection, which ranged, at the end of this time, from 0·02–0·32 unit per c.cm.

---

a personal grant from the Nuffield Provincial Hospitals Trust.
'1

† An excess of phosphoric acid would probably have been better.

After 12 hours it was still present in 50% of the exudates tested, but beyond this time there was considerable variability between results in different cases. It was noted that, though there were greater variation and prolongation in the duration of demonstrable inhibition in the blood-stream than has been commonly met with in cases treated with this dose (compare Fleming et al. 1944, McAdam et al. 1944, Child et al. 1945), there was a definite correlation between concentrations in the two fluids. Blood- and exudate-penicillin levels were similar at the end of the first hour after injection, but after this the blood-penicillin level fell more rapidly than the exudate-penicillin level—apart from one exception (case 1) there was no instance in which the blood-penicillin level after this time was higher than the exudate-penicillin level. Further, where an inhibitory concentration was prolonged in the blood, it was also prolonged in the exudate.

Urinary excretion of penicillin ranged from 30–50 units per c.cm. during the first 4 hours to 0·0–1·5 units per c.cm. by the end of 24 hours. The 4-hour concentrations were associated with penicillin levels of 0·04–0·08 unit per c.cm. in the blood-stream and 0·16–0·32 unit per c.cm. in the wound exudate. It therefore seems that the penicillin disappears from body fluids after intramuscular injection in the following chronological order: blood, wound exudate, urine.

Possible Factors Influencing Penicillin Assay.—These are discussed here as they apply more particularly to the intramuscular series, for spilling was a larger factor in the local series than any other.

(1) *Blood-urea* estimations were made in each case within 24–48 hours of the assay experiment. In one case (case 2), with a clostridial infection in which inhibition persisted for 24 hours in the exudate and for 12 in the blood, the reading was 360 mg. per 100 c.cm. In the only other case (case 4) in the intramuscular series whose blood-urea could be considered high there was no prolongation of inhibition in the wound beyond 8 hours or in the blood-stream beyond 4. In this case, however, the blood-urea only reached 40 mg. per 100 c.cm. Reduced excretion, as indicated by retention of metabolic products, may have played a part in retaining penicillin in these particular cases but does not appear t affected the others.

(2) The *pH* of the exudates was tested in four of th and in nine of those treated by local instillation. In these it was 8·0–8·4 (case 1). This was one of the c (cases 1 and 5) in which the serous character of the might have influenced the penicillin content (Bigger Inhibition was recorded in the undiluted exudate aft 8 hours in spite of the fact that the blood continued inhibition at a dilution of 1 in 4 at this period. The ing exudates were mainly thin, turbid, and darkly stain blood, with various amounts of deposit, only two purulent, and the eleven tested were within a pH of 6 Destruction of penicillin from this cause therefore have been minimal.

(3) *Bacteria* were looked for in all the wounds. I intramuscular series gram-negative organisms were p in eight and coliforms in five. Four exudates which c coliforms, besides proteus and clostridia, *Staph. alb* non-hæmolytic streptococci in one or another, were at various intervals after known amounts of [illegible] added to them in vitro. One, containing initially 1·0 u c.cm. and assayed by the cylinder-plate test, sustain loss at room temperature of 0·25 unit per c.cm. in an hour of the whole penicillin content after 9 hours. At 3 the penicillin completely disappeared within 4 hours. others had lost more than 0·3 of their original 0·4 c.cm. within 15 min. at room temperature, and the assayed by the slide test and containing initially 0· per c.cm., within 2 hours had lost 0·03 unit per c.cm. at and 0·16 unit per c.cm. at 37° C. Thus, these exudates, contained various organisms—the one in common *Bact. coli*—showed a considerable and rapid loss of pen As a control, a sterile serous wound exudate with a centration of 0·02 unit per c.cm. was set up. It l activity when kept for 24 hours at 4° C, but, on incu at 37° C without penicillin, it produced another inhi factor thus vitiating the comparison.

(4) *Effect of Extraction.*—Eight experiments were either by adding known amounts of penicillin in vitr injection into patients and comparing the assays of the centrifuged and the extracted exudates by cylinder slide test. They showed that little penicillin was lost the extraction, and that in some cases an extract would a value when the merely centrifuged exudate gave an erroneous one or none at all.

TABLE I—PENICILLIN LEVELS AFTER INTRAMUSCULAR INJECTION OF 100,000 UNITS IN 11 WOUNDS

Wound no.	Age of wound (days)	Bacteria in wound						pH	Wound exudate (slide tests)														Urine (cylinder plate tests)		
		Bact. coli	*Ps. pyocyanea*	Proteus	*Staph. aureus*	Streptococcus	Clostridium		Controls' inhibition		Units per c.cm. at hours after injection														
									Before injection	With penicillinase	1*	2	3	4	5	6	7	8	12	16	20	24	12	20	24
1 (C)	4	−	−	−	−	−	−	8·4	0	0	+	+	+	0·16	+	+	+	0·02	0	0	0	0	7	4	0·
2 (C)	6	+	−	−	−	−	+	..	..	0	2·56	+	+	+	+	+	0·32	+	+	+	0·02	0·02	..	..	..
3 (C)	6	+	−	−	−	Vir	+	..	..	0	0·32	+	+	0·32	+	0·16	+	0·32	+	0·08	..	..	..	..	..
4 (C)	6	−	−	−	+	−	−	..	..	0	+	+	+	0 02	+	+	+	0·02	..	..	..	..	..	>1	>1
5 (C)	7	−	−	−	−	Vir	+	..	..	0	>0·64	+	+	0·16	+	+	+	0·16	..	..	0†	−	..	..	..
6 (C)	8	−	+	−	+	−	+	7·5	0·02	0	+	+	>0·04	+	+	+	+	0·16	0·16	0·08	0·04	0·02	25	..	0
7 (C)	20	?	..	+	−	−	−	..	..	0	+	+	0·32	+	+	0·16	..	..	0†	−	−	0†	..	..	..
8 (E)	11	+	+	+	−	−	+	6·0	0	..	+	+	+	+	+	+	+	0·02	0·02	0	0	−	>1	0 02	0
9 (E)	40	−	+	+	−	−	−	..	0	..	+	+	+	+	+	+	+	0·04	0	−	−	−	..	..	..
10 (E)	40	±	−	+	+	NH	−	..	0	0	+	+	+	+	+	0 08	+	+	0·04	0·02	..	0	..	..	..
10 (E)	61	+	+	+	−	−	−	6·0	..	..	0·04	+	0·64	+	+	0·16	..	..	0	−	−	−	..	..	..
11 (C)	32	+	+	−	−	NH	−	..	0·02	0	+	+	0 08	+	+	0·08	..	..	..	..	..	..	1·4	+	0·4

For purposes of comparison with table II, inhibition is recorded in units on the assumption that complete inhibition in undiluted ex =0·02 unit per c.cm. In tables I and II, + or − in assay columns indicates the presumed presence or absence of inhibitio

(C), exudate centrifuged only.
(E), exudate extracted.
Vir, *viridans*.

NH, non-hæmolytic.
* Samples taken at any time within the first hour.
† 0 at dilution of 1 in 2.

TABLE II—PENICILLIN LEVELS AFTER LOCAL INSTILLATION OF 100,000 UNITS IN 8 WOUNDS

Age of wound (days)	Bacteria in wound							pH	Cubic capacity of wound (c.cm.)	Control before instillation (units/c.cm.)	Wound exudate (cylinder-plate tests)						Urine (cylinder-plate tests)					Blood
											Units per c.cm. at hours after instillation											Duration of inhibition (slide cell) (hr.)
	Bact. coli	*Ps. pyocyanea*	Proteus	Staphylococcus	Streptococcus	Clostridium	Others				0*	18	24	48	60	72	18	24	48	60	72	
9	+	+	−	−	−	+	−	..	5	<0 5	20,000	+	+	500	..	..	..	..	0	..	..	5
11	+	+	−	−	NH	−	−	5 S	5	..	20,000	+	+	+	+	2000	+	+	+	+	0·25	..
12	+	+	−	−	NH	−	−	6 S	3	..	33,000	..	..	..	..	..	+	2 0	..	..	..	4
13	..	..	..	..	..	..	..	6 4	5	..	20,000	+	+	+	100	..	+	+	+	0·25	..	..
16	..	..	..	..	..	..	..	..	5	..	20,000	+	+	+	+	500	..	..	..	..	0	..
17	+	+	−	−	−	−	−	..	6	0	16,600	+	10	..	..	..	+	2 0	..	..	..	0†
18	+	+	+	−	−	−	−	6·4	5	..	20,000	+	100	..	..	..	+	0·5	..	..	..	8
19	..	..	..	..	..	..	..	..	..	..	20,000	+	+	+	1	..	..	..	0	0	..	..
23	..	..	..	..	..	..	..	..	..	..	20,000	..	..	..	..	0	..	..	..	..	0	..
22	+	−	−	−	−	−	−	6 S	6	..	16,600	+	10	..	..	..	+	1·5	..	..	..	9
23	..	..	..	..	..	..	..	6·2	..	..	..	..	..	..	0	—	..	..	..	0	..	..
27	−	+	+	−	NH	NH	−	6 6	5	<0 5	20,000	+	+	1·5	..	..	+	+	1	..	..	7
52	−	+	+	..	NH	..	Mes	..	3	..	33,300	>1000	..	..	..	..	10	..	..	..	..	..
56	−	+	−	−	−	−	Mes	6·7	1·5	0	66,600	+	>1000	>10	..	..	+	0·5	..	..	..	>6
67	+	+	+	−	−	NH	−	6·6	1	0·25	66,600‡	+	+	..	..	0	..	..	..	..	0	5
68	+	+	+	−	NH	−	−	..	6	..	16,600	..	..	..	..	..	1·0	0·8	..	..	..	9

(E), exudate extracted.
(C), exudate centrifuged only.
NH, non-hæmolytic.
Mes, *B. mesentericus*.

* Units per c.cm. before instillation.
† On another occasion inhibition present for 5 hours.
‡ Only 66,000 units retained in wound.

NICILLIN LEVELS AFTER LOCAL INSTILLATION OF 100,000 UNITS

periments were made on eight separate wounds, less than 9 days old, and seven infected with *coli*. A mild pyrexia was present in five cases, all ad previous courses of intramuscular penicillin, and whose control exudates showed a small ring of tion had had local applications 24–48 hours pre-ly. The wound was first cleaned with saline, and a solution of penicillin was inserted, the amount ng with the cubic capacity of the wound. Spilling eakage was inevitable in open wounds during the quent period of observation, thus explaining varia-n results in the same wound. Assays were made by linder-plate method (table II). The extraction method sed in seven cases. Only one reading was taken h experiment, as the quantity of fluid required for est necessitated the emptying of the wound when sample was taken. A fresh instillation of penicillin ch assay was consequently required. As it was n that the original content of the wound was of the of 25,000 units per c.cm., the cubic capacity of the ls being 6 c.cm. or less, it was not considered ary to make early assays. The duration of a able concentration of penicillin was the main at issue, and it will be seen that in all cases this was blood at least 4 hours, for the urine 24, and for the te 48 hours. In 50% of cases tested the duration tended to 6, 48, and 60–72 hours respectively.

s, in this series, the inhibition in the wound out- that in the urine by about 24 hours. These results rrespective of the bacterial flora and the age of the l after 9 days; the pH should not have affected nicillin content; and in no patient was the blood- ver 53 mg. per 100 c.cm. A comparison of the on of inhibitory levels of penicillin by the two ds of administration are set out in table III. It that, though there is very little difference in the on of a detectable amount of penicillin in the blood-, the enormously higher local concentrations from tion into the wound led to a very much greater on of inhibition in both urine and wound exudate.

n attempt to find the amount and frequency of necessary to ensure continuous bacteriostasis in the blood-stream, smaller doses were placed in what suitable wounds still remained to us. Even 33,000 units produced a demonstrable though not necessarily complete inhibitory level in the blood for 5–9 hours. Using this as a basis it should be possible to maintain a constant inhibitory level in the blood by regular instillations of 33,000 units or more.

DISCUSSION AND CLINICAL APPLICATION

The study of these exudates demonstrates the difficulty of reliable assay of penicillin in such fluids. The presence of natural inhibitory factors in pus was demonstrated by Wright et al. (1918). Inhibition has been found by us also in infected pleural exudates and in one instance in a sterile wound exudate after incubation, and by McAdam et al. (1945) in cerebrospinal, peritoneal, and joint fluids. Therefore, before an attempt is made to assay any type of effusion or to estimate its content of penicillin, this source of confusion must be excluded. Extraction provides the best method of doing this, but it lengthens the process of assay considerably. Perhaps the most practicable method would be to control every assay of an exudate by setting up another with penicillinase, and to adopt the more tedious process only if the control shows inhibition.

TABLE III—COMPARISON OF INHIBITION AFTER INTRAMUSCULAR AND LOCAL ADMINISTRATION OF 100,000 UNITS OF PENICILLIN

Source of samples		Minimal duration of detectable penicillin (hr.)	
		Intramuscular	Local
Blood	In all cases tested ..	4	4
	„ 50% „ „ ..	7	6
Urine	In all cases tested ..	20	24
	„ 50% „ „ ..	24	48
Wound exudate	In all cases tested ..	8	48
	„ 50% „ „ .	12	60–72
Range of concentrations detected in wound exudates (units per c.cm.)		2·56–0·02	2000–1·0*

* All at 18 hours or more from instillation.

The most curious anomaly in dealing with these infected exudates was the apparently rapid destruction of penicillin when added to them in vitro and yet its long persistence in the wounds. Possibly in the case of intramuscular injection a continual leakage into the wound from the surrounding tissues might explain its presence, whereas the enormous concentrations used in local instillations would not be significantly reduced by the destruction of several units per hour. Further possibilities are that the rate of destruction varies with the concentration of penicillin, or that adsorption takes place when penicillin is first added to an exudate, with the result that its presence is not demonstrated by the cylinder-plate test. The fact that some penicillin persisted (as shown by the controls) even after an intramuscular course, or the usual local applications of 250 units per c.cm., had been discontinued 24 hours previously, showed its ability to withstand total destruction. Whatever the explanation, the assays appear to be an answer to the fears expressed by some—e.g., Meleney et al. (1946)—that penicillinase-producing bacteria would neutralise the effect of the drug in a wound.

A concentration of 0·02 unit per c.cm. was adopted as the lowest protective concentration; but, though adequate against most staphylococcal and streptococcal invasions, it might be low for clostridial infection. If, however, as Ross (1946) has noted, inhibition of relatively resistant strains depends on the size of the inoculum, then, at an early stage after wounding, when multiplication of bacteria cannot have progressed far, such a concentration should have some effect, for, according to his slide-cell tests, this concentration in circulating serum led to partial inhibition of *Cl. welchii*. Intramuscular injections of 100,000 units produced higher concentrations and complete inhibition for $1^1/_2$–3 hours, depending on the strain used. It can therefore be stated that intramuscular injection of 100,000 units leads to the exudation of a useful level of penicillin into the wound which is reabsorbed more slowly so that protection lasts several hours longer than is indicated by the level of circulating penicillin. Though the results recorded here indicate that, with the dose used, reliance could not be placed on a longer period of inhibition than 8 hours, yet none of these cases was examined during the first 24 hours of wounding, when metabolic disturbances and diminished urinary excretion following severe trauma would favour the retention of the drug within the body. Case 2, with fractures of femur, tibia, and fibula, with much laceration of muscles of the leg and back, *Cl. welchii* in his wounds, a blood-urea of 360 mg. per 100 c.cm., and no excision of his leg wound for 9 days, should have produced very favourable conditions for the development of gas gangrene. Yet inhibition and therefore protection in his case was more prolonged both in blood and wound than in any less severely injured case.

Further application to therapeutic fields may be permissible. If the prolonged presence of penicillin in wound exudates indicates its presence in any inflammatory tissue exudation, a ready explanation is found of the remarkably good results obtained by a course of once-daily injections of aqueous solutions in early syphilis (Jones et al. 1946), and of twice-daily injections in acute inflammatory conditions (Bedford 1946) and in gonorrhœa (Cohen and Grover 1945). It may therefore be feasible to treat purely focal infections by a reduced number of injections per 24 hours—e.g., once or twice—while increasing each individual dose to 100,000 units or more without recourse to vehicles, such as beeswax and peanut-oil, which delay absorption (Romansky and Rittman 1945). Certainly the fears expressed by Rammelkamp and Kirby (1945) of the danger of this type of treatment do not appear to have experimental foundation.

In wounds treated locally, not only the duration of protection but also the concentrations of penicillin make a striking contrast to those treated by intramuscular injection. It might be argued that the assay fluid in these wounds was not a true index of th centration in the tissues of their walls; but, as concentrations were detected in the circulating bl as long as after intramuscular injection, and in the for at least twice as long, clear proof was giv absorption took place. The necessity of coll sufficient amount of exudate for each assay imp use of a solution, but for practical purposes it is that, failing complete suture, full retention of preparation would always be problematical. Thi advantage can be largely overcome by using preparation—powder or tablet. The extraordinar bility and absorbability of penicillin by body renders it an ideal local chemotherapeutic agent. who have used penicillin powder, unmingled with phonamide, in wounds know how rapidly it is and absorbed, though some exudation invariably panies its insertion. So small an area as 1 sq. in absorb 1 g. within a few minutes. Wherever h stasis can be secured, there is no question therefore local implantation of the drug in a wound will surer protection than any practicable intramuscular

One other point of clinical application emerges this study. After intramuscular injection the disap ance of penicillin from the urine succeeded its disapp ance from the exudate, but in the case of local app tion it preceded it. Where wounds need to be enc in plaster, tests of the urine will indicate the presen penicillin placed in the wounds, with a 24-hour mar safety.

The recommendation of intramuscular treatm the routine method of administration of the dr battle casualties, together with the ample supp penicillin available between D-day and the end of th seems to have encouraged the idea among surgeon this is the route of choice for administration. discipline of troops has enabled this method of trea to be carried out effectively and often for a long Though the findings in this paper or the use of ve delaying absorption may enable fewer injections t used, and though oral administration may become p able (Finland et al. 1945, Ross et al. 1945), yet t methods cannot produce concentrations of the comparable with those of local administration focus of infection. To those who have practis seen the results of local administration, only us intramuscular route when inaccessibility of the necessitates it, it has long been obvious that advisedly and repeated at suitable intervals, it n avoids the very undesirable effects of discomfort pain to the patient and disturbance of his rest, b it can accomplish the desired results, both loc systemic, wherever a wound can be so sufficiently either by suture or dressings as to retain the dru

SUMMARY

A method for preparing wound exudates for as their penicillin content is described.

Sources of error from other inhibitory factors and contaminating bacteria are thereby eliminated.

A dose of 100,000 units given intramuscula severely injured battle casualties whose wound 4–61 days old invariably produced inhibition for in the wounds tested, and for 12 hours in 50% of

A dose of 100,000 units given locally into wound days old invariably produced inhibition for 48 ho the wounds tested, and for 60–72 hours in 50% of

These time-limits were irrespective of the age, ba flora, pH, or consistence of the wound exudates.

Blood and urine assays were correlated with findings and served to confirm them.

A possible application of these findings to the t ment of focal infections is mentioned.

advantages of local over intramuscular administra- . prophylaxis and treatment are also discussed.

are particularly indebted to Dr. N. G. Heatley for ıble advice throughout and for carrying out some nents; Dr. J. Humphrey for suggesting the use of nium sulphate in the process of extraction; Lieut.- l J. S. Jeffrey for allowing us to do the work on his Private P. Bowdery for technical assistance; and W. N. L. Ross for some final blood assays.

REFERENCES

d, P. D. (1946) *Lancet*, i, 977.
. J. W. (1944) *Ibid*, ii, 400.
R. F. M., Hughes, K. E. A., Evans, R. W. (1945) in Penicillin ıerapy and Control in 21 Army Group, London, p. 237.
. D. L., Grover, M. L. (1945) *J. Urol.* 53, 812.
d, M., Meads, M., Ory, E. M. (1945) *J. Amer. med. Ass.* 129, 315.
g, A., Young, M. Y., Suchet, J., Rowe, A. J. E. (1944) *Lancet*, 621.
l, L. P., Heatley, N. G. (1944) *Brit. J. Surg.* 32, 117.
y, N. G. (1944) *Biochem. J.* 38, 61.
T. R. L., Allen, S. J., Donaldson, E. M. (1946) *Brit. med. J.* 567.
m, I. W. J., Duguid, J. P., Challinor, S. W. (1944) *Lancet*, ii, 36.
— — McCall, A. (1945) *Ibid*, ii, 843.
y, F. L., Johnson, B. A., Pulaski, E. J., Colonna, F. (1946) *Amer. med. Ass.* 130, 121.
elkamp, C. H., Kirby, W. M. M. (1945) *Bull. N.Y. Acad. Med.* , 656.
sky, M. J., Rittman, G. E. (1945) *New Engl. J. Med.* 233, 577.
R. W. N. L. (1946) *J. Path. Bact.* 58, 441.
S., Burke, F. G., McLendon, P. A. (1945) *J. Amer. med. Ass.* 29, 327.
t, A. E., Fleming, A., Colebrook, L. (1918) *Lancet*, i, 831.

ORONARY OCCLUSION IN YOUNG ADULTS

REVIEW OF FIFTY CASES IN THE SERVICES

MAURICE NEWMAN
M.D. Lpool, M.R.C.P.
PRINCIPAL MEDICAL OFFICER, MINISTRY OF PENSIONS

THOUGH the last twenty years have seen a rapid lopment in the clinical diagnosis of coronary ısion, it is still considered to be very rare in young ts. A considerable number of cases in patients r the age of forty years have been recorded in the ıture, although most of the authors describe only 2 such cases individually.

uith and Bartels (1932), in reporting 2 cases in patients thirty-five and thirty-six, state that they were able ıd in the literature up to 1932 only 20 proved cases of ıary thrombosis affecting patients under forty years e. Since then many more cases have been recorded. ırant (1937) reports 7 cases in patients aged thirty-five ; or under observed in a clinic in four years. e most extensive series of cases has been recorded by dy et al. (1937), who reported 100 patients under forty s of age, collected from several hospitals and clinics in three ; of these only 8, however, were under thirty years of age. ench and Dock (1944) analysed the clinical and patho- al features of 80 cases of coronary disease in American ers aged from twenty to thirty-six from data received ıe American Army Medical Museum since the beginning ıe recent war. The striking clinical feature was over- ht (in 73 cases), and in every case arteriosclerosis was basic lesion.

ı view therefore of the apparent rarity of coronary mbosis in young people, I have gone through the rds of the Service men and women who have been lided with, or died from, coronary occlusion or mbosis, and collected the records of those up to the of thirty-five for analysis. A careful attempt has ı made to select only those cases where the diagnosis beyond doubt—i.e., either proved by necropsy or re the electrocardiogram shows the characteristic ıges of coronary occlusion in support of the clinical nosis. All doubtful cases have been excluded. ve collected records of 50 such cases which occurred ng the recent war. The youngest patient was . twenty, and no less than 22 of the 50 patients were in their twenties, although as shown below the frequency increases with age, as in the older age-groups:

Age in years	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
No. of cases	1	2	3	1	3	1	1	3	5	2	4	3	6	7	1	7
	7				8				14				21			
	15								35							

These figures show that coronary thrombosis in the young is not so uncommon as was formerly thought, and that it may occur at an early age. Of the 50 cases of coronary thrombosis the diagnosis was established clinically in 11 and by necropsy in 39.

SCOPE OF PRESENT STUDY

I have extracted from the Service documents all the available data that might have a bearing on the ætiology. None of the cases have been seen by me personally. Unfortunately all the information that one would have appreciated—such as family history, ancestral longevity, and habits, including tobacco consumption, &c.—was not recorded. On the other hand, every case was examined on entry into the Service, and in many cases several times subsequently; hence we have a record in every case of the subject's physical condition before the onset of the catastrophe. The occupation before entry into the Service has also been noted. The past illnesses, if any, and conditions of service are usually recorded; and the relation of physical stress to the onset can thus be deduced. The height and weight of the individual on entry is also usually recorded; hence the relation of body-build may also be considered.

CLINICAL FEATURES

Sex-incidence.—Coronary disease at the usual older periods is recognised as being more common in males; in the young age-group of Glendy et al. (1937) the proportion was 24 males to 1 female. In the present series there was only 1 female—a Wren aged 28. It must be remembered, however, that in the pool from which these cases were drawn there were about 10–15 males to 1 female. Even so, it appears that the disease is more common in males than in females in this younger age-group.

Body-build.—The striking feature was the good physical development and nourishment of these young adults. The recorded weight on entry into the Service in 43 of the 50 cases was over 126 lb. The highest weight was 193 lb., and many were over 150 lb. In 21 of the 39 necropsies remarks such as "well nourished," "powerfully built," and "obese" are made. The physical fitness of the subjects is indicated by the fact that 45 of the 50 were graded fit, or I, on entry. Even in the 5 exceptions the lowering of the category was due to some slight disability, such as flat-foot, defective vision, &c., entirely unconnected with the general physical development. The heart was recorded as normal in every case, including those in the lower category.

Previous Infection.—Rheumatic fever may cause proliferation and fibrosis of the elastic tissue of the coronary arteries, with necrosis resembling arteriosclerosis (Karsner and Bayless 1934). Further, acute rheumatic fever is known to cause changes in the electrocardiogram simulating coronary thrombosis. In the present series 3 persons gave a history of rheumatic fever, 2 of them having had the attack only two years before entry into the Service.

There were 2 cases with a history of scarlet fever, and in 1 of them, in which we have a detailed account of the necropsy findings, including histological examination, it appears that the scarlet fever may have been a causal factor in the pathology.

It is now generally recognised that chronic suppuration and infection extending over many years may lead to atheroma. In 1 case in this series the man sustained a gunshot wound of the arm, which necessitated prolonged hospital treatment owing to the formation of sequestra and to low-grade infection. He was discharged from the Service two years later with the wound healed but with albuminuria, and it was stated that he never felt well subsequently. He died two years after discharge from the Service, and necropsy showed "a striking degree of occlusion of one branch of the coronary artery, due to high-grade atheroma, which at this age is a gross abnormality." He was twenty-nine years of age.

It appears, then, that infection may be an ætiological factor in the production of coronary disease in young people.

Physical Strain.—Of the 50 persons, 23, or nearly half, were subjected to physical stress, the catastrophe occurring immediately after the stress in 11 cases and within a few days in the remainder. On the other hand, in 27 cases there was no evidence of any stress before the onset.

Pre-Service Occupation.—Only 8 of the 46 pre-Service occupations recorded were sedentary. Of the non-sedentary occupations about half may be considered as heavy work.

Prognosis.—In the 50 cases there were 39 deaths, a very high mortality. What is equally striking in these young adults is that in 33 of the 39 deaths the persons were found dead or died almost immediately after a collapse. The longest survival period of the 6 exceptions was nine months. In contrast to the high immediate mortality in this series, Connor and Holt (1930) found an immediate mortality of 16·2% in 287 patients of all ages. Boyd (1944) states that less than 25% of patients die in the first attack. It is also noteworthy that practically all the sudden deaths were in apparently fit and healthy men who had previously carried out their military duties without any signs of cardiac distress, the disease being unsuspected during life and only diagnosed at necropsy.

Of the 11 patients still living several have resumed work, although pain on exertion and breathlessness are complained of. As most of the survival cases are of recent occurrence, the ultimate prognosis cannot yet be determined, but 1 patient has so far survived four years since the first attack (syphilis may have been a factor in this case). The only other patient with evidence of syphilis in the series had also resumed work. It may appear, therefore, that the prognosis in syphilitic cases treated appropriately is good, but in view of the small number of cases this is doubtful. In none of the 39 fatal cases was there any evidence of syphilis either clinically or at necropsy.

Necropsy Findings.—The left coronary artery is usually considered as being more frequently affected than the right. In the present series of 39 necropsies the right coronary artery was affected in 5 cases, the left in 17, and both were affected in 16 (no record in the remaining case).

Leary (1941) considers that in the younger age-group of coronary thrombosis (from twenty-two to forty-five) the pathological lesion is due to subendothelial fibrosis, with necrosis of the intima leading to thrombosis. Calcification, he states, does not occur in this group. In the older group (over forty-seven), on the other hand, the fibrotic process is absent and calcification is well marked; thrombus formation is not so common as in the younger group. The findings in this series of 39 necropsies do not support this view. Only 2 of the cases appear to conform to Leary's younger group, showing the fibrotic reaction without calcification. The remaining 37 appear to present the usual degenerative atheromatous changes met with in coronary disease of older people.
In several cases extensive calcification of the
vessels is noted by the pathologist. Again, in
39 cases no thrombus was found.

The heart was definitely stated to be enl
20 cases. In 1 it was described as small. In
myocardial infarction was found, either recent
standing; in 1 case some of the infarcts appear
at least two years old.

DISCUSSION

This series of 50 cases of coronary disease in
adults demonstrates that degenerative change
remarkable degree can exist in the coronary art
an early age, and that coronary disease is not
as formerly thought. It is therefore no longer ju
to disregard the possibility of coronary occlusi
doubtful diagnosis owing to the youth of the
The individuals are usually in excellent health,
physical development, and capable of exertion
any untoward effects. Clinical examination is
negative, and there may be no subjective sym
before the onset.

Whatever the ætiological factors, they appear
more common in males. Body-build appears to
important factor, as most of the subjects were powe
built, robust, and often adipose. There is evidence
in some cases infections, such as rheumatic fever,
fever, and chronic prolonged low-grade toxæmia
play a part in the production of the pathological
in the coronary vessels. Atheromatous lesion
been found in children after acute infections
present series there were 3 cases with a hist
rheumatic fever and 2 of scarlet fever; 1 case fo
prolonged suppuration of a gunshot wound.
appears as infrequent a cause of coronary thro
in young people as in the older age-groups, there
only 2 cases in this series. Hypertension does not
to be so important a factor in this young grou
later life. Only 3 cases showed any evidence of
tension.

Only 8 of the 46 pre-Service occupations were sed
and half of the subjects were doing heavy work
entry into the Service. One might deduce from
figures that sedentary workers suddenly called
experience the stress of Service life were not mor
to coronary disease than manual workers; but
the proportion of sedentary to manual workers
Services is known, any inferences are prematu
unsound.

The high mortality in this series indicates th
prognosis in the young is much worse than in the
age-groups. The immediate mortality is extremel
(33 cases of sudden death out of 39 fatal cases).

In view of the large proportion of sudden
in apparently healthy individuals, the necropsy
are rather surprising. The absence of throm
most cases is unexpected. Again, the fact that
cases the myocardial infarction was due to
occlusion of the coronary vessels by advanced ath
often with calcification, as occurs in the olde
groups, and indicating that the *pathological*
had been present for several years, is also surpri
view of the youth of the subjects.

SUMMARY

A review is given of 50 cases of coronary oc
in young adults in the Services, the youngest
twenty years of age.

The subjects were of good physical developmen
previously fit condition.

Previous infection might have been of ætiol
importance in only a few cases

In more than half the cases there was no eviden
physical strain.

Sudden death took place in 33 out of 39 fatal case

necropsy, 37 out of 39 cases showed the usual
rative atheromatous changes found in coronary
of older subjects, and in 29 there was no thrombus.

ish to thank Sir Walter Haward, Director-General
dical Services of the Ministry of Pensions, for his
sion to publish this paper.

REFERENCES

W. (1944) Pathology of Internal Diseases. Philadelphia, p. 60.
, L. A., Holt, E. (1930) *Amer. Heart J.* 5, 705.
, T. M. (1937) *Ann intern. Med.* 10, 979.
, A. J., Dock, W. (1944) *J. Amer. med. Ass.* 124, 1233.
, R E , Levine, S. A., White, P. D. (1937) *Ibid.* 109, 1775.
r, H. T., Bayless, F. (1934) *Amer. Heart J.* 9, 557.
T. (1941) *Arch. Path.* 32, 507.
H. L., Bartels, E. C. (1932) *J. Amer. med. Ass.* 98, 1072.

DEFICIENCY DISEASES

RISONERS-OF-WAR AT CHANGI, SINGAPORE

FEBRUARY, 1942, TO AUGUST, 1945

R. C. BURGESS
M.B. St. And., D.P.H., D.T.M. & H.
LAYAN MEDICAL SERVICE; LATELY MAJOR R.A.M.C.,
NUTRITION OFFICER IN THE CAMP

GAPORE capitulated to the Japanese forces on
15, 1942. Of the troops captured, a proportion were
exhausted condition, having fought through a
uous campaign, but the majority had undergone
ively little hardship. In the week that followed
apitulation about 52,000 troops marched out from
pore to Changi Camp—about sixteen miles—in
eat of the day. An outbreak of bacillary dysentery
begun at the time of capitulation, and the shortage
ater and latrine accommodation in the prisoner-of-
camp rapidly resulted in an epidemic in which the
idity-rate was high, but fortunately the disease
due to a mild Flexner infection and the mortality
under the circumstances was low.

GENERAL CONDITIONS

e prisoner-of-war camp was on Singapore Island,
en country near the sea-coast. During the first two
s the area included in the perimeter wire was spacious
allowed considerable movement, but in the last
teen months it was somewhat restricted. Throughout
whole time the housing was inadequate and this was
icularly so in the last eighteen months. The peace-
civil prison was used for housing troops, and 4
were made to occupy cells designed for 1 convict;
building, with its peace-time capacity of 600–700
ners, at times held 6000 men. There were never
gh permanent buildings, and a large number of the
ps were housed in leaf huts with earth floors. These
dark, damp, and impossible to keep clean.

he climate of Singapore is equatorial. The mean
perature is about 80° F, the mean maximum and
imum varying between 87° and 74° F, and the
fall is about 100 inches a year. The temperature
es but little throughout the year and the rainfall
rly evenly distributed. The climate must to some
nt have offset the privations of the prisoners-of-war,
even when the calorie intake was relatively high
did not complain of the heat and during periods of
food intake they complained of the cold only when
ined.

lothing was extremely scarce, especially latterly, and
men wore only a pair of shorts. They worked
whole day in this half-naked state and became a
ogany colour with sunburn.

uring the first year the bacillary dysentery persisted,
about 80% of the personnel had one or more attacks.
ughout the remainder of the time the disease was
ys present and a number of minor outbreaks occurred.
he last year amœbic dysentery became increasingly
mon. In the first two years there was a relative freedom from malaria, but in the last eighteen months some 70% of the total population had one or more attacks.

THE DIET

The Japanese scale of rations for prisoners-of-war was as follows:

Rice	500 g.	Fresh vegetables ..	100 g.
Flour	50 g.	Canned milk ..	15 g.
Sugar	20 g.	Salt	10 g.
Cooking fat ..	5 g.	Tea	5 g.
Meat or fish ..	50 g.		

This scale was not maintained, as can be seen from table I. The details of the diets contained in this table were obtained by averaging the daily issues over a month. Where major changes occurred during the month they are shown.

For the first three years the daily issue of rice, or some substitute, was always more than 400 g. per man. In February, 1945, the first severe cut was made. Men on light duty—i.e., those who were not working for the Japanese or employed on hard work in the camp itself—were given only 325 g. per man per day. This was followed by further cuts, and in the last months of the camp rice was issued in daily amounts of 270, 225, and 180 g. to heavy-duty, light-duty, and no-duty personnel. Almost all the rice supplied was highly milled. The second item in the Japanese scale, a bleached flour, lasted only for the first seven months and did not reappear. The third item, sugar, was maintained at about the 20 g. level throughout the existence of the camp.

The amounts of meat and fish issued varied considerably. Fish was supplied more often than meat. Fresh fish was usually in the form of numerous species of small fish which were exceedingly bony and from which relatively little nourishment could be obtained. The dried fish was in the form of dried sprats (*Stolephorus* spp.), or partially dried and salted horse mackerel (*Caranx* spp.), or, much less frequently, larger dried fish which could not be identified.

Fresh vegetables were not supplied in the first few months, but thereafter sweet potatoes, yams, pumpkin, and cucumber were supplied on a scale exceeding that laid down. Green leaf vegetables in quantity appeared later.

The canned milk on the Japanese scale was supplied only for a little over two months. The last item, cooking fat, was supplied in much more generous amounts than laid down in the scale, except for the first few months.

The diet supplied by the Japanese was supplemented by various means throughout practically the whole period, although the supplements were at times very small. In the first six months or so canned goods, biscuits, &c., which had been brought into camp by our own troops, were issued by the supply depots on a regular scale, but these issues were so small that they were of relatively little value. In October, 1942, Red Cross supplies were brought into the camp and it was possible to supplement the diet very considerably over a period of two and a half months (see table II). In June, 1943, a levy on all money coming into the camp was instituted and the diet was supplemented by purchases of the foodstuffs shown in table I under the heading "Camp Messing Fund."

Estimated Food Value of Diet.—The details are shown in table III. In these calculations no allowance has been made for waste except in root vegetables, although during the periods when food was plentiful there was some waste of rice; in the lean periods waste was reduced to an absolute minimum.

The daily calorie intake in March and April, 1942, was about the 2100 level. It increased slowly, and by August, 1942, had risen to 2500 calories. From then till the end of the third year of imprisonment—i.e., February, 1945—it was usually above the 2500 level.

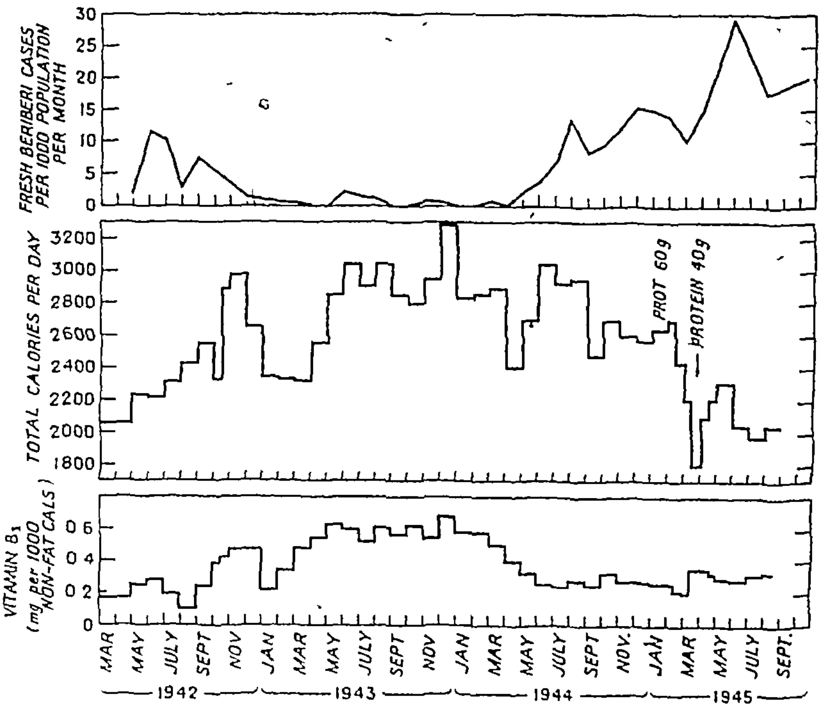


Fig. 1—Monthly incidence of beriberi compared with estimated total calories and vitamin B_1/non-fat-calorie ratio of diet.

During the last six months it fell to 2000 in the heavy-duty scale, 1700 in the light-duty scale, and 1500 in the no-duty scale. Apart from the first few months and the last six months, the calorie intake was not grossly inadequate. The same might be said of the protein content. The fat intake was low for the first few months but thereafter was usually above 50 g. per day. The calcium and phosphorus intakes reached a satisfactory level owing to the dried fish, which was mostly in the form of sprats, and the green leaf vegetables in the diet. Part of the daily ration of cooking-oil was red palm oil, and this together with the green leaf vegetables supplied a high vitamin-A intake. Green leaf vegetables and root vegetables supplied adequate quantities of vitamin C. The diet for long periods was inadequate in several components of the vitamin-B complex. It has only been possible to estimate the vitamin B_1, riboflavine, and nicotinic acid contents, and in all of these there is some deficiency. The position as assessed by estimating the food value of the diet might be summarised as follows. For three out of the three and a half years the energy intake was not grossly inadequate, but for the greater part of the time there was an imbalance in vitamin-B complex. In the last six months there was semi-starvation, with the imbalance, especially of vitamin B_1, still persisting.

In estimating the beriberi-producing potentialities of the diets as prisoners-of-war the formula suggested by Williams and Spies (1938) was used. This formula is *the ratio of vitamin B_1 in the diet to the non-fat calories.* The vitamin-B_1 values given by these writers have been used in the estimations. In comparison with the figures published more recently, these values are low, but, as will be seen subsequently, this method of appraising diets by relating them to the production of beriberi fitted the picture as it occurred in the camp and proved a reliable means of forecasting the incidence of beriberi. It is to be noted, however, that only when the values of Williams and Spies are used can the vitamin B_1/non-fat-calorie ratio of 0·3 be considered as the level at which clinical evidence of deficiency will appear.

The estimated levels of nicotinic acid and riboflavine are shown in table III. Since, with a variation in the
calorie value of the diet from 3
the absolute intakes of nicotin
and riboflavine would be
seemed advisable to relate the
these vitamins to the total energ
they are therefore also shown
grammes per 1000 calories. The
of these three vitamins has been
lated from the tables compiled b
(1945).

BERIBERI

The number of fresh cases of
admitted to hospital per 1000 pop
per month is shown in fig. 1,
vitamin B_1/non-fat-calorie ratio
liams and Spies (1938) and the
total calorie intake. It was clea
the beginning of the camp that
must occur. The estimated daily
vitamin B_1 for the first two month
less than 0·4 mg. and the vitamin B_1/
fat-calorie ratio was under 0·2 mg./
No allowance was made for loss of
vitamin in the preparation and cook
of food, and in the first few
probably 25% was lost in this
bringing the daily intake down to 0·3
Steps were then taken to check th
of vitamin. Cases of peripheral
ascribed to beriberi were admitted
hospital within a month of the start of this imba
diet. All the early cases were in men who had a
history of addiction to alcohol, but the neuritis app
in men with no such history within six weeks.

At this time, as mentioned above, a dysentery ep
was in progress, and some of the patients seven
with this disease developed the superior hæmor
encephalopathy of Wernicke. Treatment and
with vitamin B_1 were eminently satisfactory.

The outbreak of beriberi neuritis was end
November, 1942, by improvement in the diet, and
then until May, 1944, there was a relative freedom
the disease. In the early part of 1944 the vitam
non-fat-calorie ratio began to drop and a furthe
break of beriberi was anticipated. In due cou
appeared (fig. 1), and it persisted *until the camp*

This outbreak may be divided into two pe
(1) from May, 1944, to March, 1945, and (2) from
1945, until the end. During the first period œdem
by far the most common manifestation and in a p
tion of cases was not accompanied by any of the
recognised signs of beriberi. The clinician, ho
was satisfied that this was beriberi, and the re
treatment with the pure vitamin supported b
(Cruickshank 1946). The dietary picture also
that this was the diagnosis. In fig. 1 it will be see
at the end of the first period the calorie intake was
2600 *and the protein* about 60 g. per day. Apart
the chronic dysenterics, no emaciated men were
at this time, and a *representative* group of men
an average loss of only 14 lb. on their weight b
becoming prisoners. These men lost a further 15
the last six months but they still could not have
grossly emaciated at the end of the third year.
the man who got the " beriberi " was not the
chronic dysenteric but the man employed on the
work who would seem relatively fit one day and be
œdematous the next. It can be presumed the
that during this period the symptoms were a mani
tion of vitamin-B_1 deficiency.

In the second period—*March, 1945, to August,*
a new type of case appeared. The clinician
different clinical picture, occurring in the emaciated

sistant to treatment with vitamin B_1. As can be om fig. 1 there was a considerable drop in the and protein intakes. During the last six months lorie intake remained around the 2000 level and otein around 40 g. The vitamin B_1/non-fat-calorie luring this period was still at the level at which oms would be expected, and cases were still ing which were probably beriberi. It seemed that, in the later stages of the camp, two factors producing deficiency symptoms—an inadequate and protein intake; and an imbalance in vitamin nd that while some individual cases appeared to to one or other factor, in the majority both factors l a part in producing symptoms.

sum up, in the first three years vitamin-B_1 deficiency ested itself in the form of œdematous, cardiac, euritic beriberi and as Wernicke's encephalopathy, the last six months, while fresh cases of beriberi ued to occur, the picture was complicated by e œdema.

ring the last few years much experimental work e minimal and optimal requirements of vitamin B_1 een done and there is considerable divergence in timates of these requirements. During the term of sonment, the diet was so deficient in vitamin B_1 symptoms appeared; it then so improved that cases practically ceased to arise; and lastly it deteriorated and fresh cases appeared. This ience might indicate which of the levels for minimal es found by different workers in induced deficiency orrect. But two criticisms might be levelled at this nce. The first is the vitamin B_1 is nated from food s and cannot be as rately known as in experimental study. error, however, is likely to be so great one cannot give a iciently accurate e for the intake h produced disease. second criterion is iochemical investiga- have been possible the more crude rion of clinical obser- on has had to be . On the other hand, number of experi- tal subjects in this ly has averaged 00 over the three and alf years, and since e is a wide individual ation in the utilisa- of vitamin B_1 this number is probably nsiderable advantage leciding the minimal ke. Although dysen- was extremely com- it was usually not severe type, and in 14% of cases in the outbreak were recent cks of this disease ciated with beriberi. the later outbreak aria was common and sibly precipitated beri in some patients. in, the emotional state of the troops at the beginning might by raising their metabolic rate have increased their need for vitamin B_1. All these factors may have affected the findings, but it nevertheless seems profitable to draw conclusions as to the level of vitamin-B_1 intake at which symptoms appear.

The vitamin B_1 content of the diet has been estimated from two food-value tables—those of Williams and Spies (1938) and of Platt (1945). The values given by Platt for the different foodstuffs in question are on the whole somewhat higher than those suggested by Williams and Spies. In their figures Williams and Spies allowed for loss in preparation and cooking, but after the first few weeks the loss in the camp, if judged by present-day views on the destructibility of vitamin B_1, must have been negligible, so estimations based on these data probably give a low assessment of the vitamin B_1 in the diet. Table II shows the vitamin-B_1 intake as estimated from both tables.*

If the incidence of beriberi is related to the vitamin-B_1 intake as estimated from the higher value tables, it will be seen that the disease appeared in about six weeks

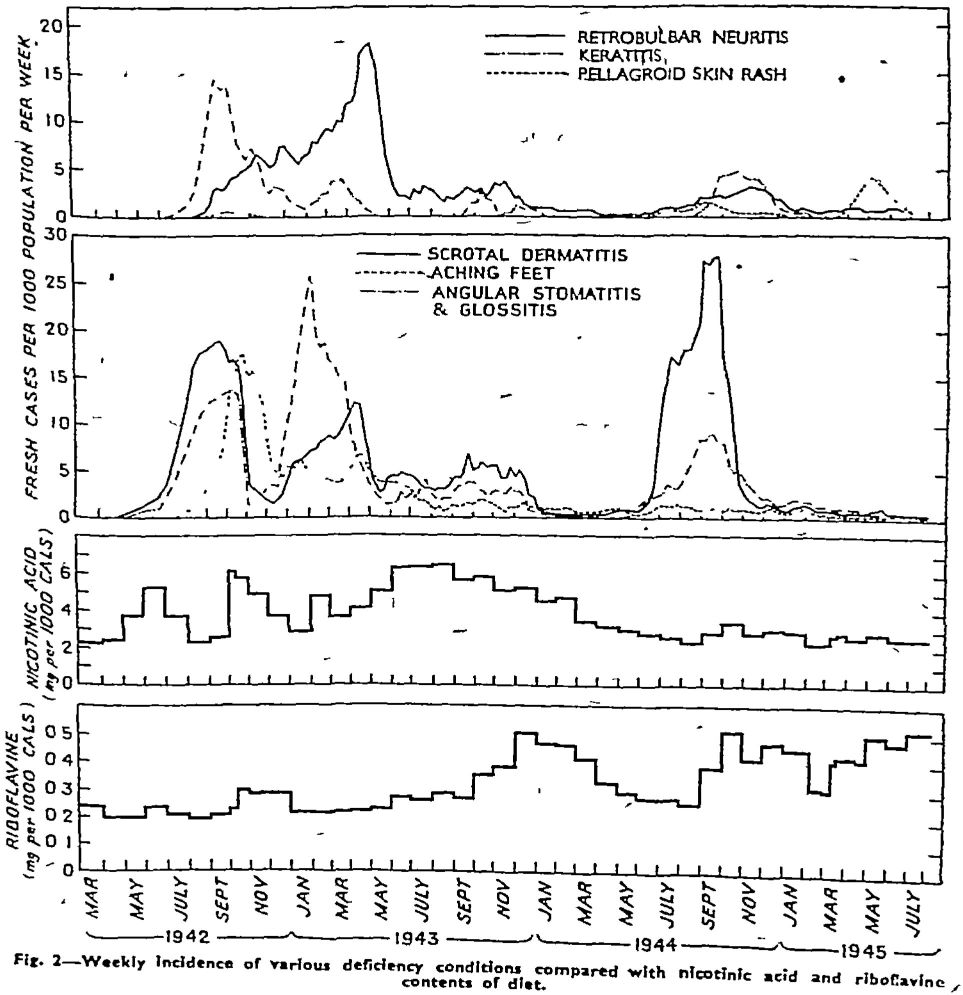


Fig. 2—Weekly incidence of various deficiency conditions compared with nicotinic acid and riboflavine contents of diet.

---

* In table II it will be seen that the total vitamin-B intake reached 1·6 and 1·3 mg. in October and November, 1944. This high level was due to soya bean in the diet. Soya beans, unless processed, are singularly indigestible, and in a prisoner-of-war camp where boiling was the only method of preparation they apparently passed through the bowel unaltered. It seems reasonable to assume that little of the vitamin B_1 was absorbed and that these figures for the B_1 intake for two months were too high. Again, in the last seven months the vitamin B_1/non-fat-calorie ratio estimated by the higher values will be seen to be relatively high. This is due to the high levels attributed to green leaf vegetables, and clinical experience leads one to believe that these figures were again too high.

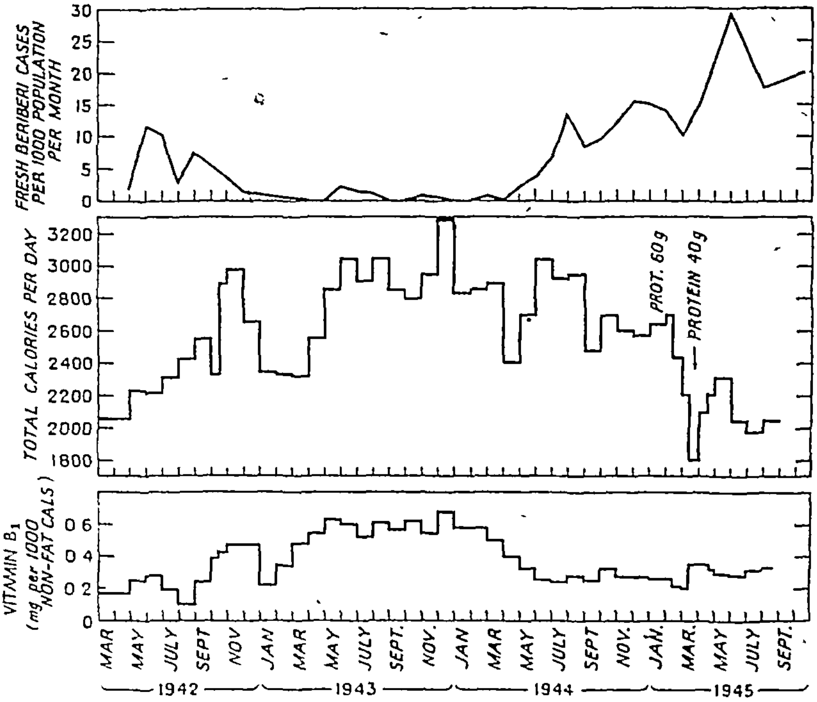


Fig. 1—Monthly incidence of beriberi compared with estimated total calories and vitamin B_1/non-fat-calorie ratio of diet.

During the last six months it fell to 2000 in the heavy-duty scale, 1700 in the light-duty scale, and 1500 in the no-duty scale. Apart from the first few months and the last six months, the calorie intake was not grossly inadequate. The same might be said of the protein content. The fat intake was low for the first few months but thereafter was usually above 50 g. per day. The calcium and phosphorus intakes reached a satisfactory level owing to the dried fish, which was mostly in the form of sprats, and the green leaf vegetables in the diet. Part of the daily ration of cooking-oil was red palm oil, and this together with the green leaf vegetables supplied a high vitamin-A intake. Green leaf vegetables and root vegetables supplied adequate quantities of vitamin C. The diet for long periods was inadequate in several components of the vitamin-B complex. It has only been possible to estimate the vitamin B_1, riboflavine, and nicotinic acid contents, and in all of these there is some deficiency. The position as assessed by estimating the food value of the diet might be summarised as follows. For three out of the three and a half years the energy intake was not grossly inadequate, but for the greater part of the time there was an imbalance in vitamin-B complex. In the last six months there was semi-starvation, with the imbalance, especially of vitamin B_1, still persisting.

In estimating the beriberi-producing potentialities of the diets as prisoners-of-war the formula suggested by Williams and Spies (1938) was used. This formula is the ratio of vitamin B_1 in the diet to the non-fat calories. The vitamin-B_1 values given by these writers have been used in the estimations. In comparison with the figures published more recently, these values are low, but, as will be seen subsequently, this method of appraising diets by relating them to the production of beriberi fitted the picture as it occurred in the camp and proved a reliable means of forecasting the incidence of beriberi. It is to be noted, however, that only when the values of Williams and Spies are used can the vitamin B_1/non-fat-calorie ratio of 0·3 be considered as the level at which clinical evidence of deficiency will appear.

The estimated levels of nicotinic acid and riboflavine are shown in table III. Since, with a variation in the calorie value of the diet fr the absolute intakes of and riboflavine would be seemed advisable to relate the these vitamins to the total they are therefore also shown i grammes per 1000 calories. T of these three vitamins has be lated from the tables compiled b (1945).

BERIBERI

The number of fresh cases of admitted to hospital per 1000 p per month is shown in fig. 1, vitamin B_1/non-fat-calorie ratio liams and Spies (1938) and the total calorie intake. It was the beginning of the camp that must occur. The estimated vitamin B_1 for the first two month less than 0·4 mg. and the vitamin B_1/ fat-calorie ratio was under 0·2 No allowance was made for loss of vitamin in the preparation and of food, and in the first few probably 25% was lost in this bringing the daily intake down to Steps were then taken to check the of vitamin. Cases of peripheral ascribed to beriberi were admitt hospital within a month of the start of this imb diet. All the early cases were in men who had a history of addiction to alcohol, but the neuritis in men with no such history within six weeks.

At this time, as mentioned above, a dysentery was in progress, and some of the patients seve with this disease developed the superior hæm encephalopathy of Wernicke. Treatment and prop with vitamin B_1 were eminently satisfactory.

The outbreak of beriberi neuritis was en November, 1942, by improvement in the diet, a then until May, 1944, there was a relative freedom the disease. In the early part of 1944 the vita non-fat-calorie ratio began to drop and a furth break of beriberi was anticipated. In due appeared (fig. 1), and it persisted until the camp

This outbreak may be divided into two (1) from May, 1944, to March, 1945, and (2) from 1945, until the end. During the first period œde by far the most common manifestation and in a tion of cases was not accompanied by any of th recognised signs of beriberi. The clinician, was satisfied that this was beriberi, and the re treatment with the pure vitamin supported (Cruickshank 1946). The dietary picture also that this was the diagnosis. In fig. 1 it will be se at the end of the first period the calorie intake wa 2600 and the protein about 60 g. per day. Ap the chronic dysenterics, no emaciated men we at this time, and a representative group of men an average loss of only 14 lb. on their weight becoming prisoners. These men lost a further the last six months but they still could not ha grossly emaciated at the end of the third year. the man who got the " beriberi " was not the em chronic dysenteric but the man employed on the work who would seem relatively fit one day and be œdematous the next. It can be presumed th that during this period the symptoms were a ma tion of vitamin-B_1 deficiency.

In the second period—March, 1945, to August, a new type of case appeared. The clinician recog different clinical picture, occurring in the emaciat

tant to treatment with vitamin B_1. As can be
a fig. 1 there was a considerable drop in the
ıd protein intakes. During the last six months
ie intake remained around the 2000 level and
in around 40 g. The vitamin B_1/non-fat-calorie
ing this period was still at the level at which
ıs would be expected, and cases were still
; which were probably beriberi. It seemed
hat, in the later stages of the camp, two factors
oducing deficiency symptoms—an inadequate
nd protein intake; and an imbalance in vitamin
that while some individual cases appeared to
ɔ one or other factor, in the majority both factors
part in producing symptoms.

n up, in the first three years vitamin-B_1 deficiency
ed itself in the form of œdematous, cardiac,
ritic beriberi and as Wernicke's encephalopathy,
he last six months, while fresh cases of beriberi
ed to occur, the picture was complicated by
edema.

g the last few years much experimental work
ninimal and optimal requirements of vitamin B_1
n done and there is considerable divergence in
nates of these requirements. During the term of
ıment, the diet was so deficient in vitamin B_1
mptoms appeared; it then so improved that
ıses practically ceased to arise; and lastly it
leteriorated and fresh cases appeared. This
ıce might indicate which of the levels for minimal
found by different workers in induced deficiency
ect. But two criticisms might be levelled at this
e. The first is
ıe vitamin B_1 is
ted from food-
ınd cannot be as
ely known as in
erimental study.
rror, however, is
ely to be so great
ıe cannot give a
ently accurate
for the intake
produced disease.
cond criterion is
hemical investiga-
ave been possible
he more crude
n of clinical obser-
has had to be
On the other hand,
ımber of experi-
subjects in this
has averaged
over the three and
years, and since
s a wide individual
on in the utilisa-
f vitamin B_1 this
umber is probably
derable advantage
iding the minimal
Although dysen-
as extremely com-
t was usually not
vere type, and in
4% of cases in the
tbreak were recent
s of this disease
ted with beriberi.
e later outbreak
ı was common and
ly precipitated
i in some patients.
the emotional state of the troops at the beginning might by raising their metabolic rate have increased their need for vitamin B_1. All these factors may have affected the findings, but it nevertheless seems profitable to draw conclusions as to the level of vitamin-B_1 intake at which symptoms appear.

The vitamin B_1 content of the diet has been estimated from two food-value tables—those of Williams and Spies (1938) and of Platt (1945). The values given by Platt for the different foodstuffs in question are on the whole somewhat higher than those suggested by Williams and Spies. In their figures Williams and Spies allowed for loss in preparation and cooking, but after the first few weeks the loss in the camp, if judged by present-day views on the destructibility of vitamin B_1, must have been negligible, so estimations based on these data probably give a low assessment of the vitamin B_1 in the diet. Table II shows the vitamin-B_1 intake as estimated from both tables.*

If the incidence of beriberi is related to the vitamin-B_1 intake as estimated from the higher value tables, it will be seen that the disease appeared in about six weeks

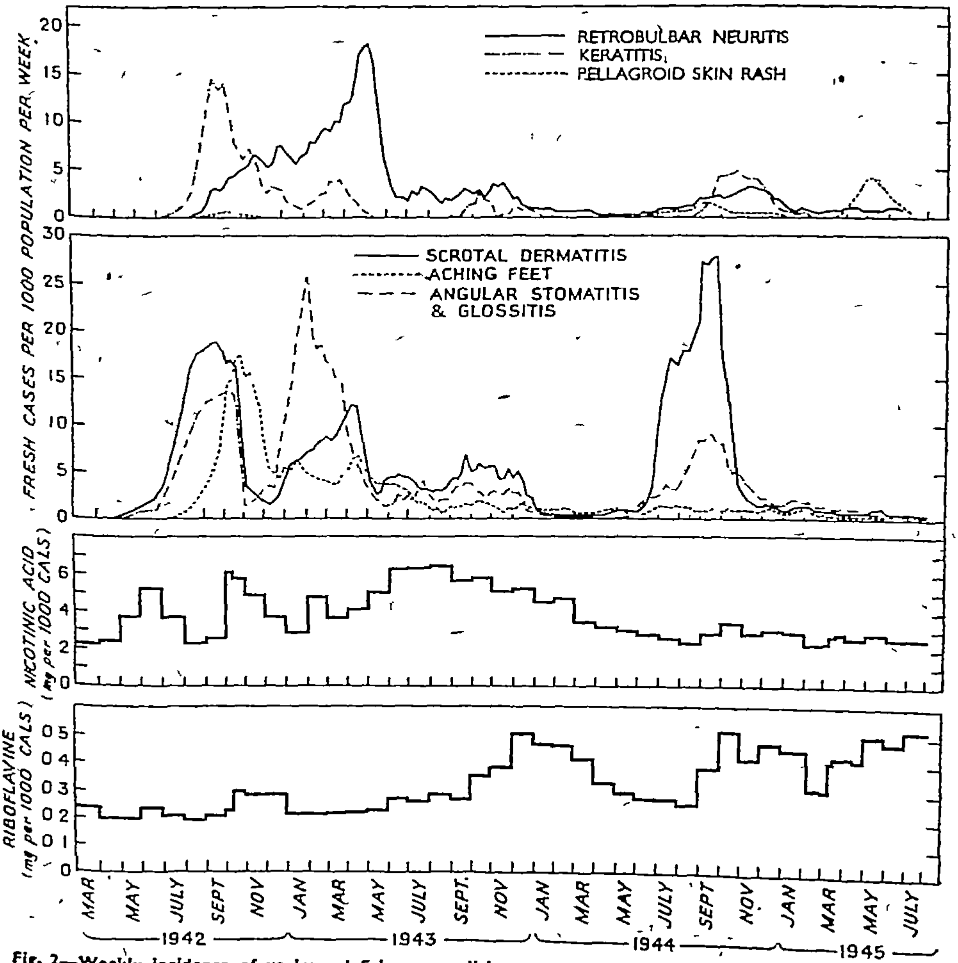


Fig. 2—Weekly incidence of various deficiency conditions compared with nicotinic acid and riboflavine contents of diet.

---

* In table II it will be seen that the total vitamin-B intake reached 1·6 and 1·3 mg. in October and November, 1944. This high level was due to soya bean in the diet. Soya beans, unless processed, are singularly indigestible, and in a prisoner-of-war camp where boiling was the only method of preparation they apparently passed through the bowel unaltered. It seems reasonable to assume that little of the vitamin B_1 was absorbed and that these figures for the B_1 intake for two months were too high. Again, in the last seven months the vitamin B_1/non-fat-calorie ratio estimated by the higher values will be seen to be relatively high. This is due to the high levels attributed to green leaf vegetables, and clinical experience leads one to believe that these figures were again too high.

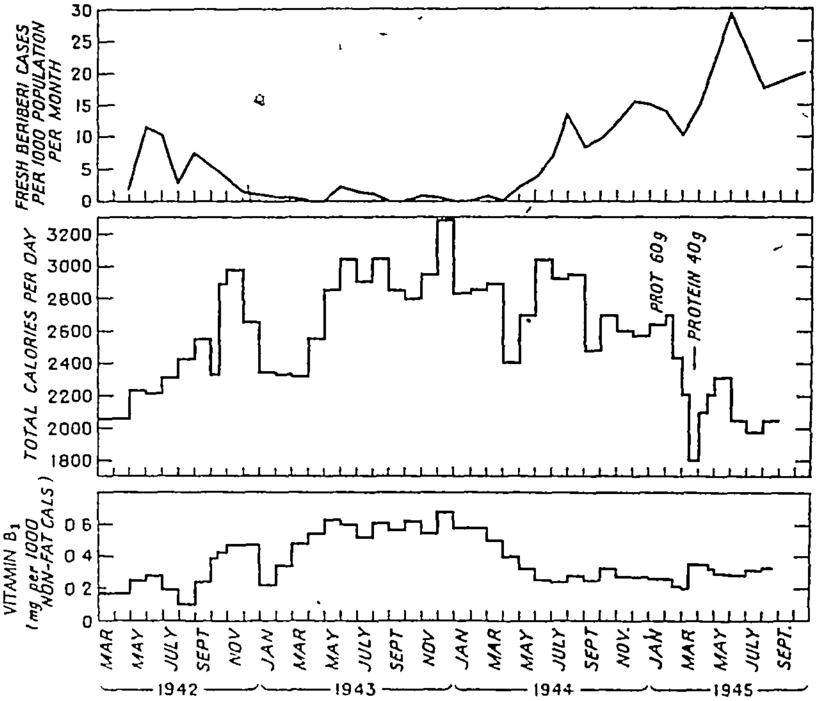


Fig. 1—Monthly incidence of beriberi compared with estimated total calories and vitamin B_1/non-fat-calorie ratio of diet.

During the last six months it fell to 2000 in the heavy-duty scale, 1700 in the light-duty scale, and 1500 in the no-duty scale. Apart from the first few months and the last six months, the calorie intake was not grossly inadequate. The same might be said of the protein content. The fat intake was low for the first few months but thereafter was usually above 50 g. per day. The calcium and phosphorus intakes reached a satisfactory level owing to the dried fish, which was mostly in the form of sprats, and the green leaf vegetables in the diet. Part of the daily ration of cooking-oil was red palm oil, and this together with the green leaf vegetables supplied a high vitamin-A intake. Green leaf vegetables and root vegetables supplied adequate quantities of vitamin C. The diet for long periods was inadequate in several components of the vitamin-B complex. It has only been possible to estimate the vitamin B_1, riboflavine, and nicotinic acid contents, and in all of these there is some deficiency. The position as assessed by estimating the food value of the diet might be summarised as follows. For three out of the three and a half years the energy intake was not grossly inadequate, but for the greater part of the time there was an imbalance in vitamin-B complex. In the last six months there was semi-starvation, with the imbalance, especially of vitamin B_1, still persisting.

In estimating the beriberi-producing potentialities of the diets as prisoners-of-war the formula suggested by Williams and Spies (1938) was used. This formula is the ratio of vitamin B_1 in the diet to the non-fat calories. The vitamin-B_1 values given by these writers have been used in the estimations. In comparison with the figures published more recently, these values are low, but, as will be seen subsequently, this method of appraising diets by relating them to the production of beriberi fitted the picture as it occurred in the camp and proved a reliable means of forecasting the incidence of beriberi. It is to be noted, however, that only when the values of Williams and Spies are used can the vitamin B_1/non-fat-calorie ratio of 0·3 be considered as the level at which clinical evidence of deficiency will appear.

The estimated levels of nicotinic acid and riboflavine are shown in table III. Since, with a variation in the calorie value of the diet from the absolute intakes of nicot and riboflavine would be seemed advisable to relate the these vitamins to the total energy they are therefore also shown grammes per 1000 calories. The of these three vitamins has been lated from the tables compiled by (1945).

BERIBERI

The number of fresh cases of admitted to hospital per 1000 p per month is shown in fig. 1, w vitamin B_1/non-fat-calorie ratio of liams and Spies (1938) and the total calorie intake. It was clear the beginning of the camp that must occur. The estimated daily vitamin B_1 for the first two less than 0·4 mg. and the vitamin B_1 fat-calorie ratio was under 0·2 mg./1 No allowance was made for loss of vitamin in the preparation and of food, and in the first few probably 25% was lost in this bringing the daily intake down to 0 Steps were then taken to check th of vitamin. Cases of peripheral ascribed to beriberi were admitted hospital within a month of the start of this im diet. All the early cases were in men who had history of addiction to alcohol, but the neuritis ap in men with no such history within six weeks.

At this time, as mentioned above, a dysentery was in progress, and some of the patients sever with this disease developed the superior h encephalopathy of Wernicke. Treatment and proph with vitamin B_1 were eminently satisfactory.

The outbreak of beriberi neuritis was end November, 1942, by improvement in the diet, and then until May, 1944, there was a relative freedom the disease. In the early part of 1944 the non-fat-calorie ratio began to drop and a further break of beriberi was anticipated. In due co appeared (fig. 1), and it persisted until the camp

This outbreak may be divided into two pe (1) from May, 1944, to March, 1945, and (2) from 1945, until the end. During the first period œdem by far the most common manifestation and in a tion of cases was not accompanied by any of the recognised signs of beriberi. The clinician, ho was satisfied that this was beriberi, and the re treatment with the pure vitamin supported h (Cruickshank 1946). The dietary picture also it that this was the diagnosis. In fig. 1 it will be seen at the end of the first period the calorie intake was 2600 and the protein about 60 g. per day. Apa the chronic dysenterics, no emaciated men at this time, and a representative group of men sh an average loss of only 14 lb. on their weight becoming prisoners. These men lost a further 15 the last six months but they still could not have grossly emaciated at the end of the third year. the man who got the "beriberi" was not the em chronic dysenteric but the man employed on the work who would seem relatively fit one day and be œdematous the next. It can be presumed th that during this period the symptoms were a m tion of vitamin-B_1 deficiency.

In the second period—March, 1945, to August, a new type of case appeared. The clinician reco different clinical picture, occurring in the emaciated

TABLE I—DAILY ISSUE OF FOODSTUFFS

Foodstuff	1942										1943	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
ighly milled)	427	435	469	460	503	506	487	474	483	483	508	500
(white)	54	63	48	48	51	45	46	..	..	..	..	..
(white)	17	20	20	17	24	26	26	10	20	20	20	20
ts (wholemeal)	9	..	..	..	..	..	..	..	..	..	..	..
(whole grains)	..	6	26	6	..	..	..	..	..	..	..	..
d nut meal	..	2	8	26	12	..	..	..	..	..	..	..
d-nut	..	..	5	4	..	..	..	..	..	5	3	2
(canned)	14	6	6	1	..	..	..	..	..	..	..	..
meal	..	..	..	..	..	28	19	..	..	..	..	..
oes (canned)	3	..	..	..	..	..	..	..	..	..	..	..
kin and cucumber	..	..	23	20	20	20	43	44	79	94	104	95
potatoes	..	..	..	20	20	20	68	109	61	124	160	161
leaf	2	..	..	15	15	15	25	11	4	4	28	18
lant	..	..	..	..	..	..	18	..	18	..	..	..
p and radish	..	..	..	..	..	..	..	..	15	9	..	..
nd fruit (canned)	7	4	3	11	..	23	..	..	..	..	..	..
and veg. and Irish stew	26	17	1	..	..	..	..	4	..	..	..	..
	26	23	39	52	53	43	45	37	35	26	..	..
	10	..	..	..	..	..	..	..	7	17	44	41
e, butter and margarine (canned)	9	..	..	..	..	..	..	..	..	17	..	..
	3	6	8	5	7	10	9	6	10	..	7	8
orated milk	26	26	4	..	..	..	..	..	..	..	..	..
polishings	..	..	..	..	..	..	6	22	28	23	..	14
bait	..	..	..	..	..	..	4	12	13	12	..	3
alm oil	..	..	..	..	..	..	..	11	10	7	15	11
ut oil	..	..	..	..	..	..	..	..	..	4	10	13
lour	..	..	..	..	..	..	..	11	..	..	..	..
corn meal (sorghum)	..	..	..	..	..	..	11	..	..	..	..	..
soup powder	..	..	..	..	..	11	..	..	..	..	..	..
inised caramel	..	..	..	..	..	4	..	..	..	..	..	..
bean	..	..	..	..	..	..	..	..	..	1	14	12

Foodstuff	1943										1944								
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
, beans	440	440	440	440	440	440	444	440	487	350	330	310	316	270	415	500	500	495	460
e	..	..	..	..	..	..	..	..	..	170	150	129	96	..	..	..	..	..	..
r	..	..	..	..	..	..	..	..	..	..	..	..	62	131	45	..	..	..	..
nut oil	20	17	20	19	19	22	20	20	20	20	20	23	18	18	20	18	17	20	20
h fish	17	16	21	18	20	30	25	25	25	25	23	21	25	25	25	25	25	25	25
d fish	30	43	62	47	53	84	73	30	56	77	57	..	..	..	18	9	10	..	11
h meat	..	..	..	..	..	..	..	22	..	..	..	19	17	..	..	44	45	39	32
	..	..	..	..	..	..	..	..	..	..	9	44	53	71	56	13	..	..	..
n leaf vegetable	..	..	..	..	..	..	..	..	..	4	4	4	4	..	..	..	..	..	..
k melons, pumpkins, &c.	6	5	6	..	..	..	..	90	90	89	70	42	36	64	50	55	60	72	180
et potatoes, cassava, &c.	38	4	80	95	44	128	143	170	100	226	100	186	40	..	..	..	..	..	..
anas	198	199	70	114	85	200	200	170	200	200	200	200	120	150	125	325	320	260	165
nut	..	..	..	..	..	..	..	..	..	..	..	..	93	10	95	90	70	32	21
n gram	..	..	..	..	..	..	..	..	..	..	..	..	3	20	7	5	..	16	..
apple	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	5	..	..	..
Camp Messing Fund																			
polishings	23	28	28	28	28	16	16	8	8	..	..	..	..	..	..	..	..	..	..
und-nuts	12	13	28	28	..	18	28	14	..	2	30	14	5	..	..	..	..	..	..
n gram	13	40	45	57	90	85	85	85	85	85	25	85	76	15	31	4	7	11	12
a bean	..	4	11	6	..	..	..	..	..	..	..	..	..	..	..	8	7	4	..
d horse mackerel	18	17	14	..	..	..	..	3	9	2	..	..	..	..	..	..	..	..	..
tebait	..	..	28	57	47	28	28	14	18	23	1	2	..	..	..	..	..	..	..
palm oil	..	..	14	3	..	..	..	..	3	17	9	3	8	14	13	16	20	22	10
et potatoes	..	..	78	165	145	114	85	..	..	..	..	..	..	..	..	..	..	..	..

oodstuff	1944			1945					
	Oct.	Nov.	Dec.	Jan.	Feb 1–9	Feb 10–28	March 1–9	March 10–21	March 21–31
ze	..	..	..	..	..	..	..	..	50
	460	460	464	460	459	495	460	270	220
ar	20	19	20	20	18	18	18	18	18
	25	25	25	25	25	20	20	20	20
a bean	59	48	..	..	..	..	..	..	..
h fish	9	..	..	10	..	13	6	6	6
d fish	35	34	29	25	34	15	22	22	22
etable oot)	136	112	163	105	208	60	24	178	178
ns	253	212	300	284	297	150	140	164	164
t	44	14	26	23	26	13	..	..	..
M. Fund									
n gram	10	1	15	15	15	13	12	12	12
oil	5	10	13	18	18	18	18	18	33

Foodstuff	1945 April 1–22	April 23–30	May	June	July
Rice	220	250	300	277	277
Maize	50	50	..	23	23
Sugar	18	18	18	20	20
Oil	20	20	20	20	20
Fresh fish	10	10	7	6	..
Dried fish	24	24	35	26	13
Vegetable (root)	172	172	183	66	122
Greens	187	187	297	250	298
Fruit	..	..	22	7	..
C.M. Fund					
Oil	33	33	33	33	33
Millet	12	..	..	..	..
Tap chips	..	12	12	12	10

Foodstuff	1945 Aug. 1–15
Rice	270
Maize	43
Sugar	20
Oil	22
Fresh fish	5
Dried fish	29
Meat	4
Vegetable (root)	82
Greens	312
C.M. Fund	
Oil	33
Tap chips	10

in April, May, and June, 1945, were supplemented with food from Red Cross parcels. The amounts were very small—about 10 g. per man per day of chocolate, jam, bully beef, &c.

Details of the light-duty and no-duty scales introduced in February and April, 1945, respectively, have been omitted owing to lack of space.

C.M. Fund = Camp Messing Fund

on a daily intake of 0·2 mg. per 1000 non-fat calories (N.F.C.) or a total intake of 0·39 mg., and that fresh cases ceased to occur when the daily intake rose to 0·5 mg. per 1000 N.F.C. or a total of 1·2 mg.; a further outbreak started when the daily intake fell to 0·36 mg. per 1000 N.F.C. or a total of 0·9 mg. If the levels are estimated from the lower figures, the disease appeared in six weeks on a daily intake of 0·18 mg. per 1000 N.F.C.; fresh cases ceased to arise when the intake reached 0·47 mg. per 1000 N.F.C.; a further outbreak occurred when the intake dropped to 0·26 mg.: and fresh cases kept appearing as long as the intake was below 0·3 mg. and even when it reached the higher level of 0·33 mg. per 1000 N.F.C.

In deciding whether a diet is beriberi-producing, a vitamin-B_1 intake of 0·3 mg. per 1000 N.F.C. should be regarded as an absolute minimum and if the higher values of the more recent food tables are used 0·4 mg. is probably the minimum. This experience suggests that the 0·37 mg. per 1000 N.F.C. found to be adequate for normal carbohydrate metabolism in experimental conditions by Keys and colleagues (1943) is inadequate to prevent cases of disease appearing in a large group. There was a great individual variation in susceptibility to beriberi which might be accounted for by variations in the requirement of vitamin B_1 for carbohydrate metabolism or possibly by varying degrees of biosynthesis (Najjar and Holt 1943). Whatever the reason, this experience supports the views of Williams and colleagues (1943a), who, on the evidence of induced deficiency, concluded that the much more liberal allowance of 0·66 mg. per 1000 N.F.C. is a minimum intake to maintain normal carbohydrate metabolism.

DISEASE DUE TO DEFICIENCY OF VITAMIN B_2

The following disease conditions appeared in the camp: angular stomatitis, glossitis, palatal erythema, scrotal dermatitis, pellagroid skin rash, aching feet, spastic paraplegia, keratitis, retrobulbar neuritis, and nerve deafness. The incidence of fresh cases of six of these conditions per 1000 susceptible population per week is shown in fig. 2. The incidence of spastic-paraplegia and nerve deafness is not shown in graph form. Since only about 40 cases of spastic paraplegia occurred in the camp, all within the first eighteen months, the incidence per 1000 population was so low that it cannot readily be shown in a graph. They occurred at a time when the incidence of other conditions, such as sore feet, was at its highest. The incidence of nerve deafness was high, but it was often not noticed by the sufferer until his friends drew attention to it, so a record of the fresh cases would not give a true picture of the outbreak.

It can be seen from fig. 2 that there were two periods of fairly high incidence of these diseases, and during the remainder of the time there was a relative freedom from them. There were also two outbreaks of beriberi, but the first was small and of short duration and occurred early. The first outbreak of the diseases now under discussion was large, extended over a long period, and appeared later. The second outbreak of beriberi was protracted and larger, while the later outbreak of the other disease conditions was of short duration and—for some of them—of much smaller dimensions. It is clear that there is little similarity between the trend of incidence of beriberi and any of these other disease conditions.

The clinical picture of the commoner conditions answers in the main to the descriptions given elsewhere. The keratitis was the disease described by Métivier (1941) as "corneal epithelial dystrophy."

Time Distribution.—There are some points of interest in the relative times of appearance and of highest incidence of these conditions. The first evidence of disease appeared early in May, 1942—about two and a half months after the capitulation and one and a half months after the first cases of beriberi appeared. The glossitis and angular stomatitis and scrotal dermatitis the first to appear; next came aching feet at the July, 1942, nearly three months later—i.e., five and months after the capitulation. Keratitis and retro neuritis appeared at the middle and end of A respectively. It will be seen that there is a tende follow this trend throughout. In October and Nov 1942, the incidence of mouth conditions and dermatitis showed a sharp decline; the decline of feet was slower and less definite, and there wa evidence of any change in the slowly rising incid retrobulbar neuritis. In the subsequent incre January and February, 1943, this order was followed, though not so definitely. At this time was a rapid increase in mouth conditions and a rapid increase in scrotal dermatitis. Aching fee keratitis showed a slowly increasing incidence did not reach any height. In 1944 scrotal de and mouth conditions again showed a rapidly r incidence, starting at the end of May and be June, while keratitis began to increase in Au Aching feet were not much in evidence at this time, though there was a rise in the incidence of retrobul neuritis, it began earlier and did not reach a high le

There is then some evidence of a relationship betw all these conditions as regards the beginning and e of outbreaks and they appear to fall into three group

1. Mouth condition and scrotal dermatitis.
2. Keratitis and aching feet.
3. Retrobulbar neuritis.

There are, however, some features which do not fit this picture—the persistence of a high incide scrotal dermatitis in March and April, 1943; the rising incidence of retrobulbar neuritis before disease conditions had appeared in 1944; and absence of a clear-cut outbreak of aching feet at time.

The high incidence of scrotal dermatitis might p be accounted for by the fact that when a deficiency exists the devitalised tissue is particularly susc to the action of any irritant or to invasion by ba and in this case a particularly irritant soap or la facilities for washing may have been responsible. explanation for these other phenomena springs t mind.

The other disease condition shown on the c pellagroid skin rash—appeared twice during out of the diseases just discussed, but the largest out began in the early months of 1945 when these deficiency conditions were almost absent.

Relation to Nicotinic-acid and Riboflavine In Fig. 2 ‡ shows that all these conditions, except pella skin rash, were common when the riboflavine leve low and outbreaks came to an end when it reach higher levels. On the other hand, only the pe skin rash bore any relationship to the estimated ni acid content of the diet, its appearance coincid a low intake of nicotinic acid, though it did not sistently appear when the intake was low. This was a mild one, appearing almost entirely in men w in the sun, so it seems that frank clinical evide disease only manifested itself under certain c conditions with this degree of nicotinic-acid defic

---

† Woodruff, M. (unpublished data), after correlating info concerning associated conditions, concluded that de disease in the Changi Camp could be divided into two g (1) a beriberi (B_1-deficiency) group, and (2) the remain B_2-complex-deficiency group. He pointed out that 49% cases of peripheral neuritis showed other evidence of while in only 5% of the disease conditions in group 2 wa an association with beriberi. Of over 1000 cases of retr neuritis, 36% had keratitis, 20% aching feet, and 23% titis and glossitis, while only 1% had beriberi. Of cases of aching feet, 31% had retrobulbar neuritis, 29% titis, and 24% scrotal dermatitis, while 7% had an as beriberi.

‡ The scale in this figure is based on the relative requireme laid down by the National Research Council of America.

ays of the camp but it proved of little value
ical use and was abandoned as a means of
laxis.

bout eighteen months in the existence of the camp
rom November, 1942, until May, 1944—by pooling
coming into the camp and by purchasing and
foodstuffs rich in vitamin B_1 on a fixed scale
t was maintained above the beriberi level. In
under the heading "camp" the details of food
sed can be seen. In the last year the money for
sing foodstuffs was less and the prices were
ically high, so little could be done to supplement
balanced and latterly inadequate diet. When the
ese learnt of their country's capitulation they
as much rice as was wanted. The consumption
e quantities of rice at this time would have led to
grave imbalance, resulting in severe beriberi. A
stand was taken in this matter, and after some
t it was agreed to restrict the daily issues of rice
evel which would not cause a serious imbalance.
nately this period was short, and with the arrival
ieving troops the prisoners-of-war went back to
opean diet.

Vitamin-B_2-deficiency Disease.—The minor manifestations in the syndrome referred to as vitamin-B_2-deficiency disease in this paper were believed to be due to a riboflavine deficiency. There was a significant association between disease conditions in this group, and no such association could be found between them and beriberi. In addition, the commencement, course, and cessation of outbreaks led us to think that, excepting pellagroid skin disease, they probably had a common ætiological factor.

The policy in prevention was based on raising the riboflavine value to the highest possible level. Some tables of riboflavine values were available in the camp, but they were old and judged by the more recent tables highly inaccurate. They did indicate however that, of the limited foods available, fresh green leaves and légumes were the only ones which could be obtained in sufficient quantity to be of value. This was the reason for the main items in the supplementary foodstuffs purchased.§

TABLE III—ESTIMATED FOOD VALUE OF FOODSTUFFS

—	1942											1943			
	March	April	May	June	July	Aug.	Sept.	Oct. 1–9	Oct. 9–31	Nov.	Dec.	Jan.	Feb.	March	April
n, g.	41	40	45	50	47	43	48	50	83	83	67	41	43	46	59
t cals.	1874	1911	2058	2017	2120	2271	2251	2075	2480	2452	2259	2173	2181	2062	2243
als.	2060	2060	2263	2222	2315	2466	2548	2260	2899	2973	2659	2340	2330	2313	2568
in B_1, µg.	390	405	593	732	551	488	678	953	1191	1246	1159	715	923	1140	1410
vine, µg.	498	434	470	566	517	484	555	559	905	890	824	557	570	586	699
nic acid, µg.	6809	7001	11,097	14,299	10,997	8489	11,194	15,366	19,180	20,782	18,588	11,142	13,892	17,118	10,601
g.) per 1000 non-als.	0·21	0·21	0·29	0·33	0·26	0·21	0·30	0·46	0·48	0·51	0·51	0·33	0·42	0·55	0·63
avine (mg.) per) total cals.	0·24	0·21	0·21	0·25	0·22	0·20	0·22	0·25	0·31	0·30	0·31	0·24	0·24	0·25	0·27
nic acid (mg.) 1000 total cals.	3·31	3·40	4·90	6·44	4·75	3·44	4·39	6·80	6·62	6·99	6·99	4·76	5·96	7·40	7·63
ms and Spies:															
amin B_1	316	341	526	587	424	393	559	842	1075	1161	1053	474	766	1019	1234
non-fat cals.	0·17	0·18	0·26	0·29	0·20	0·17	0·25	0·40	0·43	0·47	0·47	0·22	0·35	0·49	0·55

—	1943								1944							
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.
in, g.	87	106	98	86	88	85	84	137	95	109	96	47	49	65	63	56
at cals.	2300	2612	2632	2583	2472	2419	2579	2542	2099	2239	2259	1788	2161	2546	2485	2366
cals.	2867	3049	2911	3057	2854	2800	2942	3295	2834	2862	2891	2411	2691	3039	2928	2943
in B_1, µg.	1651	1812	1701	1561	1784	1352	1262	3039	2685	2577	2201	1000	924	919	887	818
lavine, µg.	872	1014	1026	1022	1034	1111	1104	1653	1226	1380	1243	789	809	862	832	773
inic acid, µg.	24,377	25,990	21,177	21,189	24,941	16,892	15,012	16,771	17,346	16,625	14,259	10,284	10,818	11,477	10,778	9737
g.) per 1000 non-cals.	0·72	0·69	0·65	0·60	0·72	0·56	0·49	1·20	1·28	1·15	0·97	0·56	0·43	0·36	0·36	0·35
lavine (mg.) per 0 total cals.	0·30	0·33	0·35	0·33	0·36	0·40	0·38	0·50	0·43	0·48	0·43	0·33	0·30	0·28	0·28	0·26
inic acid (mg.) 1000 total cals.	8·50	8·52	7·27	6·93	8·74	6·03	5·10	5·09	6·12	5·81	4·93	4·27	4·02	3·78	3·68	3·31
ms and Spies:																
amin B_1	1441	1368	1390	1610	1433	1529	1418	1724	1220	1289	1155	715	704	650	630	662
: non-fat cals.	0·63	0·60	0·53	0·62	0·58	0·63	0·55	0·68	0·58	0·58	0·51	0·40	0·33	0·26	0·25	0·28

—	1944				1945											
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.		March			April		May	June	July	Aug. 1–15
						1–9	10–28	1–9	10–21	22–31	1–22	23–30				
ein, g	54	80	79	62	62	69	49	48	42	43	50	51	63	50	40	55
fat cals.	2112	2259	2144	2161	2181	2222	2046	1824	1406	1390	1476	1587	1706	1456	1435	1480
cals.	2493	2696	2600	2579	2637	2696	2436	2205	1797	1709	2108	2219	2320	2051	1984	2057
nin B_1, µg	823	1592	1273	990	997	1015	645	554	636	771	818	802	861	728	619	877
flavine, µg.	963	1398	1092	1237	1212	1245	744	671	734	774	873	887	1172	968	1026	1126
tinic acid, µg.	9583	11,664	9834	10,140	10,289	10,537	7999	7218	6700	6950	7704	7980	9266	7466	7220	8375
ng.) per 1000 non-cals.	0·39	0·70	0·59	0·46	0·46	0·46	0·32	0·30	0·45	0·55	0·55	0·51	0·50	0·50	0·43	0·59
flavine (mg.) per 0 total cals.	0·39	0·52	0·42	0·48	0·46	0·46	0·31	0·30	0·41	0·43	0·42	0·40	0·51	0·47	0·32	0·55
tinic acid (mg.) r 1000 total cals.	3·84	4·33	3·78	3·93	3·90	3·91	3·28	3·27	3·73	3·86	3·65	3·60	3·90	3·64	3·64	4·07
ans and Spices:																
tamin B_1	547	743	602	595	590	607	421	300	490	490	523	514	494	412	442	488
: non-fat cals.	0·26	0·33	0·28	0·28	0·27	0·27	0·21	0·20	0·35	0·35	0·35	0·32	0·29	0·28	0·31	0·33

---

§ The other foodstuffs were introduced for the following purposes: (*a*) The rice polishings were to ensure the absence of beriberi and also to raise the nicotinic-acid level. (*b*) The palm oil was to increase the calorie intake and make the food more palatable. (*c*) The dried fish, preferably sprats, was to maintain at a reasonable height the calcium and protein intake.

Since some of these conditions are probably manifestations of riboflavine deficiency the estimated levels of intake at which symptoms appeared are worthy of note. On an estimated level of 0·21–0·25 mg. per 1000 calories, symptoms appeared in two and a half months in 1942; in 1944, on an intake of 0·33–0·28 mg. per 1000 total calories, this appeared in about the same time. It is not clear, on the basis of our estimated levels, why the number of cases should have fallen in October, November, and December, 1942. The improvement was due to Red Cross supplies coming into camp. For purposes of estimation, the diet during the period under discussion was assumed to be in accordance with the advice given on how the extra food should be consumed; but, since it was distributed to units and in some cases to individuals, the extra food may in fact have been consumed more rapidly with a resultant higher intake over a shorter period.

TABLE II—RED CROSS SUPPLEMENTS OCT 9 TO NOV. 30, AND DEC. 1 TO 27, 1942

Foodstuff	Average daily diet (g.)		Foodstuff	Average daily diet (g.)	
	Oct. 9–Nov. 30	Dec. 1–27		Oct. 9–Nov. 30	Dec. 1–27
Atta flour	17	..	Dried fruit ..	2	..
Dhall	8	8	Cocoa ..	8	8
Milk (canned) ..	21	9	Barley ..	1	..
M. & V.	39	39	Cornflour ..	2	..
Corned beef ..	71	32	Biscuits ..	9	..
Ghee	8	..	Vitaminised caramels ..	1	..
Soupmix	3	3	Jam	2	..
Mabela	10	10	Sugar (white) ..	17	..
Vegetables and tomatoes (canned)	23	23	Lime juice ..	2	..
Guava (canned) ..	9	9			

In fig. 2 it will be seen that a fresh outbreak of keratitis occurred in October, November, and December, 1943, at a time when the riboflavine values of the diet were higher than they had been, and there is evidence of a similar rise in the other conditions. In August the Japanese began making a big aerodrome near the camp and labour was drawn from the camp. Labouring in the heat of the day and in the full glare of the sun may have played some part in producing this increase.

In general the estimated intake of riboflavine corresponds fairly closely with the incidence of disease, so it seems worth while to compare the level at which disease occurred with similar levels found by workers in induced deficiency. Sebrell and colleagues (1941) produced deficiency disease which appeared between the 89th and 232nd days on a riboflavine intake of 0·21 mg. per 1000 total calories. This is in line with experience in the camp where disease developed in 80 days on an intake of 0·21–0·25 mg. per 1000 calories. Williams and colleagues (1943b) found no deficiency disease on an intake of 0·35 mg. per 1000 calories. In the camp disease persisted on this level although it had begun on a lower intake and on two occasions the outbreak of disease did not end until the level reached 0·5 mg. per 1000 calories. This would support the suggestion of Williams and colleagues that 0·5 mg. per 1000 calories is an adequate intake.

There were further experiences which have some bearing on this point. In 1943 a party of 7000 men went up country and 25% of them had vitamin-B_2 deficiency in one or more of the forms which have just been discussed. They went up to conditions of starvation, disease, and appalling hardship, and at the end of nine months when 44% had already died they were returned to the Singapore camp. Within a week or two of leaving the relative comfort of the camp the minor manifestations of vitamin-B_2-deficiency disease disappeared and did not recur as long as the conditions of hardship lasted. Little or no retrogression in cases of retrobulbar neuritis could be found on their return. The calorie intake during this expedition was at times as low as 1200 per day although it was at other times above the 200 rapid loss of weight occurred. The Japanese merciless in their demands for output of work, itself was the direct cause of a number of deaths. diets consisted of rice and very little else, and the ri- flavine intake for long periods was about 0·2 m 1000 calories; for about a month in one camp it low as 0·15 mg. per 1000 calories.

When a man is consuming his own tissues his for riboflavine may be less, and this idea led investigate the relative incidence in different gro men in Changi Camp. In the kitchens and food sto men were better fed; hungry men cannot be ex- to handle food all day without taking a certain of it. On the other hand the men working on the aerodrome got only their bare rations and were cal for a greater energy output. In the better fed grou incidence of scrotal dermatitis during an outbreak 34% and in the worse fed group it was only 18% were several hundred men in each sample and unfo nately weights were not taken, but had they been th is little doubt that there would have been a clearer difference. The impression gained was that rib deficiency was essentially the disease of the man who *maintaining or gaining weight.* The pellagroid skin r on the other hand occurred essentially in emaciated m In some 60 men treated for skin rash in hospital average weight was 102 lb., while a group of fit men the same period had an average weight of 125 lb

PREVENTION OF DEFICIENCY DISEASE

In the prevention of deficiency disease beriberi w always regarded as being of primary importance, fo is a killing disease. The vitamin-B_2-deficiency dis- though they seemed likely to be responsible for a siderable amount of permanent incapacity, were portant as a cause of death. Steps taken to pre beriberi built up the diet to a greater or less exte components of the vitamin-B_2 complex and measures taken had both purposes in mind. It advisable, however, to deal with each separately

Beriberi.—The occurrence of beriberi was fore some time before it actually appeared, and atte were made immediately to minimise the danger. best means of doing this was of course to enrich the and in March, 1942, the G.O.C. Prisoner-of-war Ca Changi, wrote to the H.Q. Imperial Japanese A pointing out that the diet was grossly deficient in ce vitamins and asking for additional foodstuffs which known to be in Singapore in considerable qua The Japanese did nothing, although the case presented again and again in the early months.

A measure which was adopted early and to wh considerable attention has been paid throughout the preparation and cooking of food so that none of vitamin content was lost. This is particularly impor in the case of the rice. The ordinary highly milled has about 0·5 μg. vitamin B_1 per g. in the pericarp and fine layers of pericarp that may remain after mi It is however *readily soluble in* water, and if it is wa and the water discarded about half of it is lost, a if it is boiled in excess of water which is afterwa discarded there is a further loss. Seeing that at time total daily intake of vitamin B_1 was not more than 0·4 and that 0·2 mg. came from rice, the importance of measure can be appreciated.

A measure which is widely advocated for preven beriberi is the growing of yeast, but unfortunately yeast is grown on a medium rich in the vitam complex it has little capacity to synthesise this vitam In fact recent work (Malm 1945) suggests that it does synthesise it at all but simply captures it from medium in which it is grown. Yeast was grown in ie and Mollison (1943) may reveal the group while cells are still present. There are times when nportant to know the nature of a patient's cells, complete typing has not been carried out before the ition of a line of treatment which has falsified the picture. Such a case was seen recently at this al, and it was considered that investigation of the marrow red cells, which are not subject to the same ement by donor cells as are those of the peripheral , might establish the true blood-group. As no nce to the reliability of bone-marrow grouping could md in the available literature, normal children were as controls at the same time.

INVESTIGATION

rrow was obtained from twelve children who had no transfusions and in whom marrow puncture being undertaken for diagnostic purposes.

e first two marrow samples were taken from the m with an ordinary Salah needle. As, however, ield of sternal marrow was rather too small for the se, particularly in small infants, and rendered r oxalating of the sample difficult, the later punc were made through the flat area of bone internal istal to the tibial tuberosity. Needles, used accord o the size of the patient, were those designed by on (1944) for marrow infusions.

rrow was aspirated into a syringe, from which it was ediately expelled into a small test-tube containing le oxalate mixture (3 parts of ammonium to 2 parts otassium oxalate) which had been allowed to dry then moistened with a drop of normal saline just re use. If the oxalate was used dry, various degrees glutination jeopardised the chances of satisfactory ping. Only marrow discharged direct into the ate was used, any adhering to the side of the tube g carefully avoided.

arrow suspensions so obtained were ABO- and Rh- d in small tubes in the ordinary way.

RESULTS

ll twelve marrows showed the same ABO agglutino- s and agglutinins as those found in their corresponding imens of blood. Similarly, no difference was found he Rh genotypes of marrow and peripheral blood from same patient. The presence of nucleated red cells the myeloid series did not interfere with reading test.

rom these results it appeared that the true blood- up and Rh genotype could be ascertained from the row cells. Therefore marrow grouping was under- en at intervals on the patient whose peripheral d could not be grouped owing to repeated blood- sfusions. The following hæmatological findings are en in detail to illustrate how the divergent blood marrow pictures came into line again as the donor s were eliminated.

aby X, with erythroblastosis fœtalis, was the second d of healthy parents, whose first child was normal. Baby X born on Feb. 20, 1946, and became jaundiced on the 1. Blood-group A, β in the serum, Rh-positive.

he mother, blood-group A, Rh-negative, had a low Rh ibody titre at birth of the baby, and a titre of 1/64 on ch 2, 1946, and 1/256 on March 5, when some blood was en from her for preparing anti-Rh serum.

etween Feb. 24 and April 5 the baby received eight trans- ons of whole blood with group-O Rh-negative blood, the in red-cell count after each transfusion being only transient. the meantime the mother's blood had been processed by s B. E. Dodd, who reported that it contained antibodies he Rh factors C and D.

n April 6, to cross-check this finding, the baby's blood was genotyped and found to be Rh-negative. Also, the O group, which was put up as a routine, was O, with neither or β demonstrable in the serum.

esults were the same on April 7, except that weak β was present in the serum. This reversal of group with β in the serum was also confirmed by Miss Dodd on April 8, though at birth the baby had group-A Rh-positive blood.

From April 5 to 18 the baby slowly lost its red cells, the count falling from 4,700,000 to 4,280,000 per c.mm. On the 18th the peripheral blood-cells were group O, with β in the serum, and there was a trace of agglutination with anti-D serum. In the marrow, on the other hand, the cells were group A and Rh genotype CDe, cde.

As marrow smears at this stage showed only 2·5% of primitive red cells, it was apparent that the repeated transfusions were producing a condition of red-cell hypoplasia, and further transfusions were withheld in the hope that the marrow would be stimulated to make its own cells.

On April 25 the peripheral red cells were grouped as A, with a good anti-D reaction but no agglutination with anti-C serum. On the 27th the blood-count had fallen to 3,530,000 per c.mm., and the blood antigens were A CDe, cde, a formula corresponding to that in the marrow.

These results are summarised in the accompanying table. Since then, the marrow has produced 12% of normoblasts, and the red-cell count is slowly rising. In the meantime the father, group A, has been genotyped as CDe, cDE.

CHANGES IN THE BLOOD

Date	Antigens present	
	Blood	Marrow
Feb. 25 ..	A Rh +	..
April 5 ..	O cde, cde	..
April 6 ..	O cde, cde	..
April 7 ..	O cde, cde	..
April 18 ..	O cDe, cde	A CDe, cde
April 25 ..	A cDe, cde	A CDe, cde
April 27 ..	A CDe, cde	A CDe, cde

DISCUSSION

It is clear from the twelve normal controls that the bone-marrow red cells contain the same hæmagglutinogens as do the peripheral cells. Also, the case illustrated demonstrates that, where frequent transfusions have been given, the marrow cells, being in a sense fixed, may reveal the true antigens when the peripheral blood-group is either obscured or altered by donor cells.

In the present case there was no indication at birth to genotype the baby, which was merely recorded as Rh-positive. As the father was CDe, cDE, and the mother made anti-C and anti-D agglutinins, there cannot be much doubt that the infant was originally a CDe, cde, a typing confirmed by the marrow and to which the peripheral blood eventually reverted. As the father was not available when the baby's blood was giving an untrue picture, the marrow reaction gave valuable corroborative evidence about the type of agglutinins present in the mother's serum.

The behaviour of β suggests that the original antibody was obtained from the mother, its disappearance and reappearance coinciding with its obsolescence and the baby's starting to manufacture its own β.

The return of the antigens to the blood showed some odd features. That the Rh antigen was detectable before its ABO counterpart was probably due to the use of higher titre anti-Rh sera; but why D should reappear before C was demonstrable with high-titre serum is not so clear, if the fixity of antigens is accepted, and may be due to the fact that the factor D as a rule seems to be more readily agglutinable than either C or E.

I am indebted to Dr. Donald Paterson for access to the patient, to Miss B. E. Dodd for her help with the sera, and to Mr. G. W. Cecil for much technical assistance.

REFERENCES

Coombs, R. R. A., Mourant, A. E., Race, R. R. (1946) *Lancet*, i, 264.
Dacie, J. V., Mollison, P. L. (1943) *Ibid*, i, 550.
Gimson, J. D. (1944) *Brit. med. J.* i, 748.
Lattes, L. (1932) Individuality of the Blood, London.
Wiener, A. S., Sonn, E. B. (1946) *Amer. J. Dis. Child.* 71, 25.

The amounts arrived at were as follows:

Rice polishings	30 g.
Palm oil	30 c.cm.
Green gram (*Phaseolus radiatus*)	100 g. in all
Ground-nut	
Soya bean	
Sprats or dried fish	50 g.

The camp food tables indicated that the green gram, *Phaseolus radiatus*, had an unusually high riboflavine content while that of soya bean was low. The more recent tables show the reverse, but in view of our information the green gram was always purchased in preference to the other légumes. It will be seen from fig. 2 that the riboflavine level of the diet did not reach any great height until December, 1943, and from table I it will be clear that the cessation of the outbreak of vitamin-B_2-deficiency disease was probably due to the introduction by the Japanese of 170 g. of soya bean in place of an equal amount of rice.

The importance of green leaf vegetables in the diet was appreciated by the British administration in the camp, but, for the first two years, the Japanese were either indifferent or could not be made to understand that much sickness could be avoided if they would allow the proper cultivation of vegetable gardens. At the end of the second year a new Japanese commandant was more intelligent about the matter and good vegetable gardens were made. From September, 1944, until the end of the camp these gardens were probably responsible for our freedom from these diseases. In fig. 2 it will be seen that the riboflavine content was higher in that period.

Since no green leaf vegetables were available at the time of our greatest need and légumes were not obtainable in the required quantities, at the beginning of 1943 it seemed worth while to try to extract the vitamins from some of the non-edible plants and grasses growing round the camp. Fortunately power was available and the engineers built various ingenious devices for crushing leaves so that their cellular structure was broken down. They were then macerated with water and the extract was drunk. As long as fresh rapidly growing structures were available the results obtained from this extract were excellent, but soon the area to which the prisoners-of-war had access was cleared of all such plants. Coarse tropical grasses were then used and little benefit appeared to be derived from the extract.

SUMMARY

An outline is given of the general living conditions in the prisoner-of-war camp on Singapore Island. The Japanese ration scale and the supplements that could be procured are described.

Estimation, week by week, of the composition of the diet showed that the energy and protein intakes were not grossly inadequate except in the last six months, but there was throughout a deficiency of one or more of the B vitamins.

There were two outbreaks of beriberi. The first, which occurred early, was uncomplicated but in the second the picture was confused by famine œdema.

Comparison is made between the minimal levels of intake of vitamin B_1 to prevent disturbance of metabolism, as defined by workers on induced deficiency, and the estimated levels at which beriberi appeared or disappeared in the camp. It is concluded that the higher limits proposed on the basis of experimentally produced deficiency (0·66 mg. per 1000 non-fat calories daily) are in best agreement with experience in the camp.

The order and times of appearance of disease conditions attributed to deficiency of one or more components of the vitamin-B_2 complex are compared with those of beriberi and with the estimated riboflavine and nicotinic-acid contents of the diet. They appeared and disappeared in a definite sequence, independent of and with an inverse correlation with the n intake, except pellagroid skin rash which showed relationship to the intake of nicotinic acid.

The requirements of riboflavine as defined by w in induced deficiency are compared with the levels in the camp diet. The level required to deficiency as suggested by the camp diet is simi the findings of some experimental workers, and experience again supports the higher suggested levels (0·5 mg. per 1000 total calories daily).

Of 7000 men who left the camp to work up the more than a third had signs of vitamin-B_2 defici camp, and they subsequently suffered so severely starvation and disease that 44% died within months; yet under these conditions the signs of vi B_2 deficiency, except retrobulbar neuritis, disapp Further, vitamin-B_2-deficiency disease in camp commoner in the relatively well-fed men. Pella skin rash, on the other hand, was more often fou the emaciated.

The means used in attempting to combat defic diseases in the camp are briefly described

I wish to thank Lieut.-Colonel Kenneth Alford, I.M and Major R. Orr, A.A.M.C., for their coöperation in t prisoner-of-war camp, and Dr. Isabel Leitch, Rowett Res Institute, for her help and criticism in the preparation of paper.

REFERENCES

Cruickshank, E. K. (1946) *Proc. Nutrit. Soc.* (in the pre
Keys, A., Henschel, A. F., Mickelsen, O., Brozek, J. M. *J. Nutrit.* 26, 399.
Malm, M. (1945) *Svensk. kem. Tidskr.* 57, 42.
Métivier, V. M. (1941) *Amer. J. Ophthal.* 24, 1265
Najjar, V. A., Holt, L. E. jun. (1943) *J. Amer. med. Ass.* 12
Platt, B. S (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.*
Sebrell, W. H., Butler, R. E., Wooley, J. G., Isbell, H. (1941 *Hlth Rep., Wash.* 56, 510.
Williams, R. D., Mason, H. L., Wilder, R. M. (1943a) *J. Nutrit.*
— — Cusick, P. L., Wilder, R. M. (1943b) *Ibid*, p.
Williams, R. R., Spies, T. (1938) Vitamin B_1 (Thiamin) and in Medicine, New York.
Woodruff, M. (1942) Report on Deficiency Diseases Admitted Australian General Hospital, Changi Prisoner-of-war (unpublished).

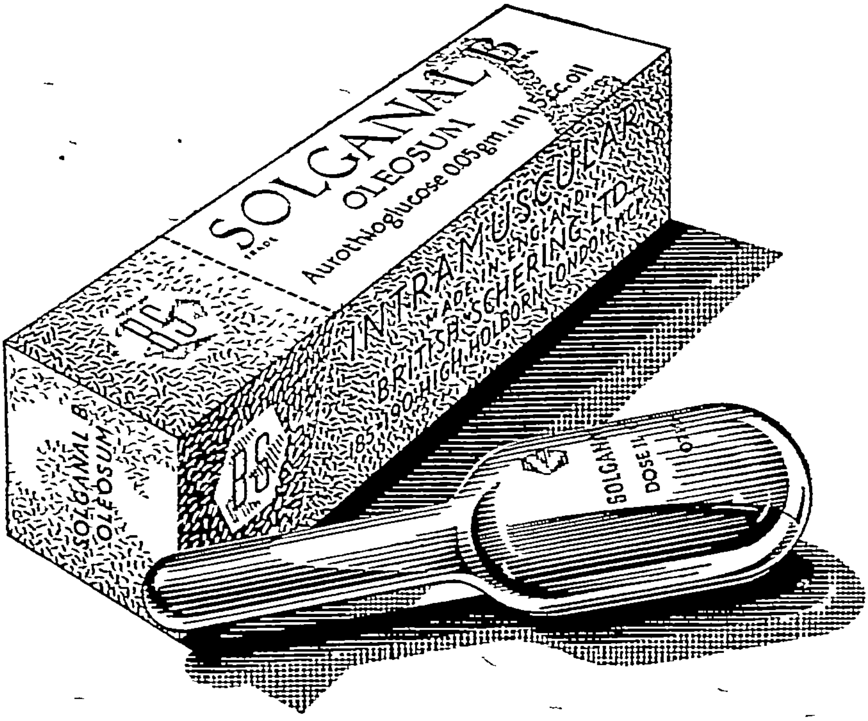
BLOOD-GROUPS IN BONE-MARROW

I. A. B. Cathie
M.D. Lond.
CLINICAL PATHOLOGIST, HOSPITAL FOR SICK CHILDREN
GREAT ORMOND STREET, LONDON

"The fact of belonging to a definite blood gr a fixed character of every human being and can be al neither by the lapse of time nor by intercurrent dis (Lattes 1932). This statement on the fixity of t groups may be said to represent the present cons of opinion.

With the modern tendency to give repeated transfusions in various conditions, however, r ment of the patient's red cells with donor's cells that part of the patient's peripheral blood will eve characters of the donor's cells. Should the donor carry different *hæmagglutinogens* from those of recipient, anomalous results will be obtained attempting to establish the patient's own group cases are on record where all the patient's cells had replaced and only the group of the donor coul ascertained from the patient's blood. In such a an apparent, though not real, change of blood g may be found. For example, the blood of case II Coombs et al. (1946) appears to have been ent replaced; and case 4 of Wiener and Sonn (1946) an erythroblastotic infant whose Rh-positive cells w entirely replaced by Rh-negative donor cells wi two days.

Hitherto, in establishing the true group of such c there has been little option but to wait until the do cells have disappeared; though, as the patient's start to reappear, the differential agglutination met



No Shortage Now

Supplies of SOLGANAL B OLEOSUM are now adequate to meet all demands. This detoxicated gold preparation in oily suspension—slowly absorbed, gradually excreted and remarkably free from toxic sequelæ—is supplied in ampoules of 0·01, 0·02, 0·05 and 0·1 gm. in line with the most recent clinical reports. New literature which deals objectively with chrysotherapy most gladly sent on request.

Solganal B Oleosum

THE NEW DETOXICATED GOLD PREPARATION

'Solganal B' is the registered name which distinguishes aurothioglucose manufactured by

BRITISH SCHERING LIMITED, 167-169 Gt. Portland St., London, W.1

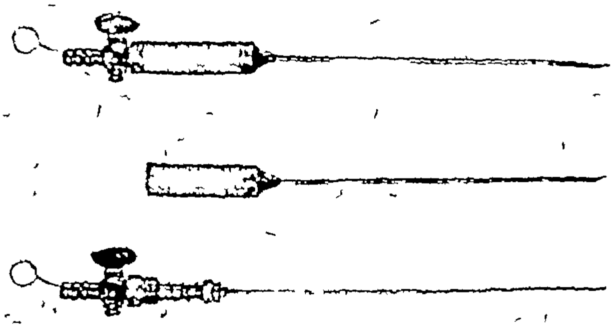
BS

New Inventions

PNEUMOPERITONEUM-REFILL NEEDLE

THE induction of a pneumoperitoneum is much more difficult in most cases than that of an artificial pneumothorax, because, owing to the softness of the abdominal wall, it is extremely difficult to be certain when the point of the needle is within the peritoneal cavity. Again, in the pleura a good negative pressure is usually found, except when the pleura is adherent, whereas in the peritoneal cavity the pressures are often difficult to record because: (1) they are not so great as in the pleural cavity, and (2) a loop of intestine or a piece of omentum may obstruct the hole in the needle.

The needle described was designed by Veress, in Switzerland, to get over these difficulties. It is extremely simple to use and very efficient. The point of the needle is formed by a strong, hollow, but blunt trochar running within the needle, with an exit hole at one side, just below the blunt end of the trochar. The distal end of this trochar is fitted with a spring so that it projects about 1 mm. beyond the point of the needle, but can be withdrawn within the needle, being pushed out again by the spring when released. When the needle is pushed through the tissues of the abdominal wall, the blunt trochar is pushed back against the spring, and the cutting edge of the needle, within which it runs, pierces the tissues easily, the spring pushing the blunt trochar forward as soon as the peritoneal space is reached, displacing the gut or omentum in front of it, but not damaging it, as the trochar is blunt. A swing on the manometer may or may not be recorded, but it is quite safe to allow air to run in at this stage, at the end of which the pressures will be easily recorded.



Above, the needle assembled for use. Middle, the cannula. Below, the spring and trochar.

The technique in actual experience is helped by the following suggestions. After anæsthetisation of the skin and parietal peritoneum in the usual way, the needle is inserted much more easily if a small nick is made in the skin just medial to the lateral border of the rectus at about the level of the umbilicus. As the needle is pushed forward, the blunt trochar is pushed back against the spring as it pierces the external fascial layer of the sheath of the rectus abdominis, but springs forward as soon as this is pierced. As the needle is pushed forward slowly, the blunt trochar is again pushed back as the internal layer of the sheath of the rectus abdominis is encountered, the trochar springing forward again when this is pierced. These two movements are important to observe and are much more easily detected if the patient raises his head from the couch, thus contracting the rectus abdominis while the needle is being inserted.

The original needle obtained from Switzerland is somewhat large; so the size has been reduced by the Genito-Urinary Manufacturing Co. Ltd., but the principle is exactly the same.

It is interesting to note that about 1925 G. Zorraquin, of Buenos Aires, designed a needle which was almost identical with this and was made by the Holborn Surgical Instrument Co. Ltd. for the exploration of the chest in cases of pleural effusion, so that fluid could be obtained without damaging the underlying lung.

JOSEPH SMART, M.D. Camb., M.R.C.P.
Physician in charge of Outpatients,
London Chest Hospital.

Reviews of Books

Technical Minutiæ of Extended Myomectom Ovarian Cystectomy

VICTOR BONNEY, M.S., M.D., F.R.C.S., consulting
logical and obstetrical surgeon to the Middlesex
and consulting surgeon to Chelsea Hospital for
London : Cassell. Pp. 282. 30s.

THIS, the latest and probably the best book pen of Mr. Victor Bonney, is the gospel of the of conservatism. In it, with the utmost simp language and great clearness of detail, he almost every possible way of performing myomectomy. Mr. Bonney takes his reader and nary pupil by the hand and leads him into the and demonstrates each step in each type of op The 241 illustrations, drawn by himself, are in th style as those of the famous *Textbook of Gynæc Surgery*—little masterpieces of exposition. All logists and surgeons likely to perform myomectomy have this book.

The 1945 Year Book of Neurology, Psychiatry Endocrinology

Edited by HANS H. REESE and MABEL MASTEN; No
D. C. LEWIS; and ELMER L. SEVRINGHAUS. Chica
Year Book Publishers. Pp. 720. 18s.

SERVICEABLE and comprehensive, this triple vol devotes four-fifths of its space to neurology and crinology (almost equally divided) and a fifth psychiatry: clearly the editors consider that a proportion of the voluminous literature of psych adds nothing to our knowledge. It is conseq regrettable that space is allotted to reflective or exp articles, such as "viewpoints on basic proble psychopathology," "relationship of psychoanal psychiatry," "psychiatric problems in obstetri gynæcology," which contain little that is new. neurological section the editorial notes are frequ helpful; special attention is drawn to the me responses to intrathecal medication, and the adva of giving penicillin otherwise than by this route treatment of meningitis. The section on endocr is the last which Professor Sevringhaus will edit, prefatory note he compares the situation in 1931, he began the series, and now: great advances hav made, but fundamental relationships have not and there are still conspicuous gaps—for examp our detailed knowledge of the mechanism of the me cycle and of the hormones of the pituitary. This is, as ever, the most thickly packed, and bespeak great if uneven activity in this field that pre American laboratories and clinics, from which com of the papers abstracted. The value of the would be enhanced if the index were more itemis

A Practical Handbook of Midwifery and Gynæcol

(3rd ed.) W. F. T. HAULTAIN, M.B., F.R.C.O.G., obste
and gynæcologist to the Royal Infirmary, Edi
CLIFFORD KENNEDY, M.B., F.R.C.O.G., assistant
logist to the infirmary. Edinburgh: E. & S. Liv
Pp. 388. 20s.

THIS handy synopsis of obstetrics and gyn represents the teaching of the famous Edinburgh and it will therefore have a wide appeal north Tweed, but English readers will find the book acceptable to southern examiners. Though pr written for the student about to qualify, it is also book of reference for the busy practitioner who to check up on some point quickly. The chapters infant and on breast-feeding are particularly good the chapter on sexual disorders is useful and con small section on contraception. Not all will agree view that chloroform is the best anæsthetic when uterine relaxation is required for difficult rotati version, but the authors make the claim with laudable reservations. The Edinburgh school, sure, are masters in the administration of chloro but the English schools are not, and until its use is from obstetrics, some pregnant women will have lives endangered every year. There are other thetics available which are safer and equally efficient

THE LANCET

ONDON: SATURDAY, SEPT. 21, 1946

Occasion for Thrift

ι Armed Forces, it is clear, are to be maintained
ubstantial strength in peace-time ; but though
e claims must be met in peace as in war they
o longer have exclusive priority. Other tasks
nost equal urgency lie ahead : the country's
ged economy must be repaired, and the Govern-
has pledged itself to improve the life and lot
people. If these purposes are to be fulfilled
upply of skilled man-power must be carefully
nded and wisely allocated between the various
ants Thus the medical profession must meet
igher peace-time requirements of the Services
helping to man the new National Health Service,
will ultimately call for more doctors than the
ry now possesses. Plainly, more doctors must be
ed; the universities are alive to this fact,[1] but
cannot promise any large increase within the
few years. Meanwhile, the best use must be
of existing resources. In these straits, an
oritative body is needed to balance the claims of
an and military medical services and satisfy
that no doctor is wastefully engaged in either.
its establishment during the war, the Medical
onnel (Priority) Committee has concerned itself
exactly these questions. The committee's
ortance will be undiminished in the days of peace ;
ed, its brief should be extended and its member-
enlarged to represent all interested parties.
luties should, as now, be advisory, and, like other
ial committees that are in the making, it should
ish its findings

nere will be plenty of work for the committee.
night first consider the proposal that medical
ents shall continue to be called up for military
ice, except when specially deferred, before starting
r medical course proper. The alternative system,
which doctors would normally do their military
ning after qualifying, would require close under-
ding between the Ministries of Labour, Education,
Health, and the universities and Service depart-
ts ; and it could not be effected immediately since
medical schools already have more candidates
they can accept from the ranks of the demobilised
in a year or two the change should be practicable,
it is not too early to plan for that time Many
lents would prefer that the break, if break there
t be, should come between school and university
ier than later ; but will it not be more profitable
both the community and the individual if the
tor serves after qualifying, when he can help to
ice Service demands on the country's restricted
ply of medical men and can gain the knowledge of
rice medicine which he will need if ever he is
lled to the Forces ?

hen there is the step which many think inevitable
ie merging of the medical branches of the three Fighting Services into a single organisation, no longer keeping itself aloof from civilian medicine but closely linked to the National Health Service. This measure would provide doctors in the Forces with an opportunity for widening their experience and might well increase the efficiency of medical care for all fighting men ; but above all would be its saving in overlap and hence the economy it would effect in hospitals, equipment, and man-power. This step was advocated early in the war by MEDICUS, M.P.,[2] after a tour of the B.E.F., and now, as then, the need is for a unifying authority. The Personnel Committee would be well constituted to study this scheme in detail and to advise on its practicability.

There is a further aspect of economy that should not be overlooked : time spent with the Forces should be profitably occupied. And here again is an opportunity for the integration of military and civilian medicine which we have already discussed in detail.[3] The late war proved the eagerness of the young medical officer, even under difficult conditions, to enlarge his experience. This thirst for further knowledge was to some extent recognised and appeased by short courses and clinical meetings in hospitals ; during the last campaign in Europe one hospital (known, with a levity that concealed respect, as the University of Duffel) won a reputation for teaching that might be the envy of established centres. In peace-time this field can be more fully explored (see p. 432). It may be found that some of the best teachers have returned to civilian life, and certainly much will depend on the good will of civilian hospitals. The Services, for their part, may look with favour on a suggestion which is calculated to increase their appeal and efficiency. The newly recruited medical officer must first serve with a battalion or in a comparable post with the other Services, for this work calls for a special knack that is not learnt overnight. Moreover, better than any other appointment, it teaches the precise functions and effects of Service medical practice ; indeed, many of those who joined the Forces for the duration as specialists suffered a permanent disability through not having held these posts But training should also include opportunities to work in military medical units, large and small, and even in administrative offices. This arrangement would not only benefit the Services by instructing men in their operation but might also, by providing first-hand experience of many branches of medicine, enable junior graduates to return to civilian life with a better idea of where their bent lay.

Service with the Forces should not be divorced from, or delay advancement in, civilian work, but should rather be a normal phase in a single career. It may be that in the years to come the young doctor will be able to count his time in the Forces towards seniority in the National Health Service, and that senior men will be free to return to the Services for short periods without jeopardising their civilian position ; they might, if specialists, thus help to make good a deficit that will probably be felt even more strongly in the Services than in civilian practice. Such a correlation may have to wait on more settled days ; but economy in the use of doctors cannot wait.

---

[1] See *Lancet*, August 31, p. 305.

[2] *Ibid*, 1940, i, 987.

[3] *Ibid*, 1945, ii, 531.

ARNOLD BOOKS

New (Second) Edition viii + 164 pages, illustrated In the Press 10s. 6d. n

THE LOUSE

An Account of the Lice which infest Man, their Medical Importance and Control

By **PATRICK A. BUXTON,** F.R.S., Director of Medical Entomology, London School of Hygien and Tropical Medicine ; Professor of Medical Entomology, University of London.

This edition has been completely revised, and in part rewritten, in the light of the greatly increased knowledge of rec years. *The Lancet* described the first edition as "an admirable statement of existing knowledge of the anatomy, physiolog and natural history of the louse, and the insecticidal methods applicable to it."

TEN TEACHERS'

Midwifery

Seventh Edition. Edited by **CLIFFORD WHITE, Sir COMYNS BERKELEY** and **WILLIAM GILLIATT.** viii + 562 pp., 232 illus. 4 plates. 18s. net

Sir ROBERT MUIR's

Text-book of Pathology

Fifth Edition. viii + 992 pp., 599 illus. 35s. net

W. E. LE GROS CLARK's

Practical Anatomy

xvi + 470 pp., 251 illus., many in colour. *Published* September 12. 25s. net

SAVILL's

Clinical Medicine

Twelfth Edition. Edited by **E. C. WARNER,** M.D., F.R.C.P. xxviii + 1168 pp., 185 illus., 7 col. plates. 30s. net

★ Owing to present conditions it is extremely difficult to guarantee stocks of these books, and it is advisable to place an immediate order with a bookseller to avoid disappointment.

Descriptive leaflets and Medical List post free on request

EDWARD ARNOLD & CO.
LONDON. 41 & 43, MADDOX STREET, W.1

---

3 water-soluble vitamins in one tablet

● Stomatitis, anorexia, gastro-intestinal disturbances, states of debility, fatigue, and certain skin disorders are often associated with a lack of the water-soluble vitamins, nicotinic acid, B_1 and C. When these vitamins are supplied as an adjunct to treatment an improvement is usually noted. 'Nicorbin' tablets containing these nutrients, given thrice daily, supply the average adult requirement.

During pregnancy and lactation, and during the process of wound healing the increased demands for these vitamins are met by supplying 'Nicorbin.' Whenever, from deficient dietetic intake or excessive physiological need, these water soluble vitamins are required, 'Nicorbin' will prove valuable.

COMPOSITION

Each 'Nicorbin' Tablet contains —
Aneurine Hydrochloride (vitamin B_1) 1 mg
Ascorbic Acid (vitamin C) 25 mg.
Nicotinic Acid (P.P. factor) 10 mg

PRODUCT OF THE GLAXO LABORATORIES

NICORBIN

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

roups, and TANNER has seen it even at 91; it s certain that this diagnosis is often overlooked. he old patient with ulcer, gastrojejunostomy is ient, for the mucosa is usually degenerative and ation does not recur. The stomach growth, of se, does require partial gastrectomy, and it is zing how well the aged withstand this procedure. NER records a successful total gastrectomy in a ent of 74, and WAUGH and GIFFIN[9] one in a ent of 72. In such patients preliminary splanchnic k may be dangerous, for, especially with the rior approach, pressure on the aorta may fracture e of the atheromatous plaques usually present. ection of œsophageal growths is now being success- performed even in old patients, and the risks are h taking. The pharyngeal pouch quite common ne aged is being dealt with under local anæsthesia irst transplanting the pouch to a higher level and second operation coring out the mucosa. Growths ne colon can be expeditiously dealt with by Paul's ation, and even if there are secondaries in the an attempt should be made to remove the local rth. Patients with secondaries in the liver often for two or three years in fair comfort and removal spare them the misery and pain of the local ad. The aged do not always need the full abdomino- ineal resection; where the growth is at the irectal junction, or high in the rectum, the simpler ration of leaving a distal blind rectal stump rtman's operation) is ample. CUTHBERT DUKES,[10] GLOVER and WAUGH[11] have shown that distal ograde spread is slow, and that it only occurs in of cases, and then usually only when the normal vard channels have been blocked. Section of the vel an inch below the palpable edge of the lesion satisfy pathological requirements. The breast cinoma usually needs but a local amputation to oid the local ulcerating mass, and to remove what patient knows perfectly well is slowly whittling ay her life. Admittedly, such carcinomas are often remely slow growing, but, with the ever-extending opaganda on cancer of the breast, no patient can miss it lightly from her mind. Minor operations, n circumcisions, are often necessary in old people d should not be shirked. Hæmorrhoidectomy can ily be performed under local anæsthesia. The frail lady withstands well an operation for procidentia, d it will give her comfort. As HOWELL astutely narks, "trifling matters often distress the aged ore than great ones."

The possibility of a vascular catastrophe alway vers over the old patient. Embolism of a mesenteric peripheral vessel is a condition amenable to gery, and has to be borne in mind. The peripheral bolus is too often overlooked till too late for gery: numbness and loss of power, rather than in, may be the chief symptoms. The limb with a ripheral embolus, if operated on early (usually under al anæsthesia), does well. Arteriosclerotic gangrene now being treated by more conservative methods; ngrene of a single toe often ends with no more than s of the superficial skin. Reflex vasodilatation,[12] heating the body or immersing the opposite limb in water at 110° F, is probably the best way of encouraging the collateral circulation; it does as much as a sympathectomy and certainly more than vasodilator drugs. For the frail patient, particularly with spreading gangrene, amputation under ice anæsthesia has a place. The results of surgery in the "old man's illness"—prostatic obstruction—have been much improved; Millin's retropubic operation has largely justified the original optimism. The other old person's disease, trigeminal neuralgia, is being increasingly operated on early, and these patients withstand the operation remarkably well. Fractured neck of femur, which was the harbinger of death for many of the aged in the past, is now almost routinely treated with the trifin nail—a procedure which even the very old withstand well. Aseptic necrosis and extrusion of the pin have rather damped initial hopes, but a good result can usually be anticipated in at least 50% of cases; where this fails McMurray's osteotomy is extremely valuable.

One example of the success being attained must suffice. CARP[13] has collected figures from a variety of sources covering 2558 patients submitted to operation at ages over 60; these show an average operative mortality of 13·1%—a gratifying result. It does indeed seem that the age of the "lean and slippered pantaloon" may become a less formidable problem to the surgeon than that of the "fair round belly with good capon lined."

Annotations

DENTAL CONTROVERSY

THE dispute between the dental profession and the Minister of National Insurance raises an important point of principle. Negotiations for a new scale of fees for dental work done for insured persons began as long ago as January of this year, when the Dental Benefit Council set up a negotiating committee consisting of three dentists, representatives of three approved societies, and a number of Government members. This committee issued a questionary to more than 1000 dentists engaged in N.H.I. practice to ascertain (*a*) to what extent the cost of running a practice had risen owing to the war, and (*b*) what were the private fees charged to non-insured patients in the same walk of life as those treated under N.H.I. The committee issued a unanimous report and submitted a scale of fees which represented an average increase of about 100% over the pre-war scale. This scale of fees has now been rejected by the Minister of National Insurance. The dental profession feels that having exhausted what it regards as the normal negotiating machinery it has no alternative but to abstain from participating in the service. The dental profession fears that if the present Minister is prepared to disregard negotiating machinery in connexion with dental benefit in this way, and to rate the value of a dentist's services so low, there can be no hope of any better treatment in a scheme applying to the whole nation.

The scale which the Minister proposes to adopt from Sept. 30 will yield an average net increase of 50% over pre-war, according to the Ministry's letter circulated to dentists on Sept. 12, but the rise is not uniform. Thus the fee for full upper and lower dentures, which unfortunately is the form of treatment most necessary for working-class patients, is £7 15s. When the scheme started in 1926 this fee was £6; the present fee is £6 7s. 6d.; and the dentists were prepared to accept 9 guineas. The dentists contend that they cannot

---

Waugh, J. M., Giffin, L. A. *Proc. Mayo Clin.* 1941, 16, 562.

Dukes, C. E. *J. Path. Bact.* 1940, 50, 527; *Proc. R. Soc. Med.* 1941, 34, 571.

Glover, R. P., Waugh, J. M. *Surg. Gynec. Obstet.* 1946, 82, 434.

Learmonth, J. R. *Edinb. med. J.* 1943, 50, 140.

13. Carp, L. *Ann. Surg.* 1946, 123, 110.

Surgery in the Aged

THE defeatism to surgical diseases in the aged is passing. The view of operation on the elderly as a desperate expedient is still reflected in the undue proportion of old people with acute surgical complaints to be found in institutions for the chronic sick; but the E.M.S., by sending doctors from voluntary hospitals as emergency staff to these institutions up and down the country, has influenced surgical opinion on the illnesses of old people. Many surgeons have returned to voluntary hospitals with an increased respect for the tolerance of the elderly for major operative procedures. The improved expectation of life means inevitably that surgeons will be increasingly occupied with patients over 60.

As TANNER[1] remarks, the improved results are not so much due to changes in technique as to better pre- and post-operative care and a higher standard of anæsthesia. The old patient's knowledge of dietetics is rarely profound; he is often faddy, practising self-imposed restrictions, especially on protein foods, green vegetables, and fruit. Rationing difficulties and poverty have usually added their burden. A preliminary period in hospital before operation, when surgical circumstances permit, is well spent; WHIPPLE[2] has pointed out the need for extra proteins to increase the powers of wound healing, and STEVENSON, WHITTAKER, and KARK[3] have found powdered milk useful for this purpose. With syrup flavourings it can be made into a palatable drink, and should be given between meals, say at 10 A.M. and 2.30 P.M., in 8 oz. feeds, and a further 16 oz. as a milk-shake at 9 P.M. By this means 72 g. of protein and 1100 calories can be added to the daily diet. It seems unnecessary to give amino-acids. Extra vitamin C is needed for the formation of collagen fibres,[4] and many of these old patients bear the stigmata of vitamin-B deficiency; so vitamin supplements in full doses should be added to the diet. The hæmoglobin needs watching, for many of these old people are anæmic; this is best corrected with iron, or if need be liver, for blood-transfusion requires particular care, since their hearts will not tolerate much overloading. Bed is a dangerous place for the old man; as often as not rest in bed, rather than the surgeon, is responsible for a pulmonary embolus. This is a complication ever to be feared in the aged, and in some operations a preliminary double femoral ligation, as is being increasingly practised in America, might be advisable. Just before operation is not the best time to change the habits of a life-time, so enemas and purges are better avoided. Smoking should be restricted for 48 hours before operation, but it will do no good to cut off the pipe after meals and have the patient fumbling, restless, and miserable. Morphine, when indicated for pain, should be given in small doses. HARDY, WOLFF, and GOODELL[5] have shown that the maximum analgesic effect is obtained with gr. $^1/_6$, and that a larger dose merely depresses respiration The patient who requires preoperative gastric lavage should have his washout first thing in the morning and just before the evening meal; the usual practice of leaving the empty for the night robs the patient of the of the night's absorption of food and fluid

Of all the anæsthetics for the aged, local with the patient preferably asleep (at any rate Englishman), seems to be the most spinal anæsthetics, especially high spinals, are tolerated by old people. Gas and oxygen is the most dangerous, for any sustained cyano lethal. Light cyclopropane is almost certain safest. The old patient should not be intubated routine; when the patient is light this leads to bronchial spasm, and, as NOSWORTHY[6] has out, this may largely be responsible for lung collapse. Postoperatively, intravenous d better avoided; with a small catheter at least 5 of fluid a day can be administered by rectal Protracted gastric aspiration is badly tolerated, it is often maintained unnecessarily long after abdominal operations. Although his tissues heal well, an the peritoneal cavity does not seem to lose its po of coping with any mild spilling, the old per resistance to infection is always poor, penicill preferably started before operation, is a valu weapon against wound sepsis, which may spread i the peritoneal cavity and be responsible for the su quent peritonitis. To avoid the unpleasantne repeated injections, penicillin may now be g in 100,000-unit doses, and Dr. FLOREY and colleagues demonstrate in this issue (p. 405) that dose given thrice daily will maintain a bacterio concentration in the blood. Prophylactic sulphona therapy TANNER thinks is of definite value ag pulmonary and peritoneal infection; he quo series of 120 unselected partial gastrectomies w one death, and attributes part of this succe sulphonamides. Sulphamerazine may come to the drug of choice, for it has the advantage of requ only 8-hourly administration and its conjugated f is relatively soluble in neutral and acid urine, t avoiding the risks of drug concretions and da to the renal parenchyma.[7] Succinyl sulphathi has proved its value in the preoperative prepar of the patient for intestinal surgery; in append so treacherous in the aged, it may be used as an ad safety factor. For diverticulitis, often seen in aged, phthalyl sulphathiazole, which requires daily dose of 3–6 g., may be superior.

In the decision to operate on an old pers surgeon should not be too much influenced b knowledge that the patient's blood-pressure is even a history of coronary thrombosis is no ab contra-indication. Hypertension was present in of 341 "healthy" Chelsea pensioners examined HOWELL.[8] "Give me preferably the old patient high blood-pressure," GORDON-TAYLOR has remar Fall of pressure in the aged is a bad prognostic and when "systolic figures approach 110, the out is grave."[8] The surgeon should bear in mind hæmoptysis, hæmatemesis, and profuse rectal blee may result from hypertension rather than disease. Gastric surgery for ulceration is now increasingly performed with success in old p Gastric perforation is by no means rare in the

---

1. Tanner, N. C. *Brit. med. J.* 1943, i, 563.
2. Whipple, A. O. *Ann. Surg.* 1940, **112**, 481.
3. Stevenson, J. A. F., Whittaker, J., Kark, R. *Brit. med. J.* 1946, ii, 45.
4. Hunt, A. H. *Brit. J. Surg.* 1941, **28**, 436.
5. Hardy, J. D., Wolff, H. G., Goodell, H. *Amer. J. Physiol.* 1940, **129**, 375.
6. Nosworthy, M. D. Quoted by Mimpriss, T. W., Etheridge *Brit. med. J.* 1944, ii, 406.
7. Henderson, J. *Surg. Gynec Obstet.: int. Abstr. Surg.* 1946, 156, 444.
8. Howell, T. H. *Practitioner,* 1946, 156, 444.

value, unit for unit, than injected penicillin in ntrol of wound infection—a conclusion which all ts will welcome if it means that the 3-hourly on régime can be avoided. It is clear, also, that so have not put nearly enough penicillin into the s we have treated and have therefore had to waste supplementary systemic administration. Some al points await elucidation. Can one put into a a large enough dose of penicillin to sterilise it ertainty at a single stroke? Do the tissues show ed resentment to pure powdered penicillin in quan- nd would healing be impeded by excessive exuda-

If a single sterilising dose proves impracticable, is the best method of implanting penicillin into a d wound at, for example, 24-hourly intervals? ns that despite the vast experience of the past six the last word on the best method of treating ls with penicillin has yet to be said.

TEST FOR THREATENED ABORTION

presence of pregnandiol in the urine can be deter- qualitatively by a colour reaction which is neither ularly involved nor time-consuming; and Guter- now claims that this can be used as a diagnostic r pregnancy with an accuracy comparable to that Friedman test. He suggests, moreover, that the on is an accurate aid to prognosis in certain ications of pregnancy, notably threatened abortion. gnandiol is the excretion product of progesterone, appears in the latter half of the cycle, ceasing one ur days before the onset of menstruation. If sation occurs the corpus luteum persists and the ion of pregnandiol continues. In normal pregnancy cretion of pregnandiol follows a fairly well-defined m. At first it is comparable to that in the latter f a normal menstrual cycle, but about the ninth elfth week the excretion rises sharply to reach a two weeks before delivery; it then drops sharply, regnandiol has completely disappeared from the twenty-four to forty-eight hours after delivery. well known clinically that the corpus luteum begins generate about the third month of pregnancy, which double oöphorectomy can be carried out ut necessarily disturbing the pregnancy. It is ble that the placenta assumes the function of ing progesterone from about the twelfth week rds; and the commonest time for abortion corre- ls to the stage at which the corpus luteum is sing and the placenta is beginning to take over nction. During this transitional period pregnandiol tion is liable to drop to a low level; and a drop the danger zone may well herald the onset of tened abortion. The test could thus forewarn the ian, who could take evasive action by ordering sedative drugs, and possibly progesterone by ion.

terman's colour reaction[2] consists briefly in adding ntrated sulphuric acid to the pregnandiol extracted the urine; a positive reading is indicated by a deep r or orange, which represents 0·4 mg. pregnandiol 0 c.cm. of urine, or roughly 6–10 mg. in twenty-four —the normal amount in early pregnancy. He d 73 patients with threatened abortion; among the pregnandiol colour reaction with concentrated uric acid was persistently negative in 39, of whom orted. The reaction was persistently positive in whom 30 did not abort. Out of the 73 there were ng prognoses; but in 3 of the 4 positives that ed there was good reason for it—placenta prævia o and a large fibroid in the third. The test is most up to the third month. Thereafter with the tion of pregnandiol rising from 20 mg. to 50 mg., a positive reading may persist for the first twenty- hours after fœtal death. Guterman offers no explanation of the pregnancy which continues despite a persistently negative colour reaction. The great advantage of the method is its cheapness and speed; a result can be obtained on the day that the specimen reaches the laboratory. It is hoped that English workers will try it out; if it is found to be as good as Guterman claims, it should prove useful in the treatment and prognosis of threatened abortion.

HOSPITAL CATERING IN MIDDLESEX

By way of experiment, the Middlesex County Council have decided to appoint a catering officer to one of their hospitals.[1] The appointment is in the first instance to be temporary, though not with any fixed limit of time, and is to carry a salary of £750 a year, rising by annual increments of £25 to £850. In a report to the public-health committee, Dr. H. M. C. Macaulay, county medical officer of health, notes that existing arrangements present many of the drawbacks discussed by King Edward's Hospital Fund for London.[2] Thus hospital catering comes under the dual control of the steward, who undertakes the buying and supervises the porters who distribute the food to the wards, and the matron, who supervises both the kitchen staff and the nurses. The matron may have the help of a housekeeping sister, whose short course of training, planned in days when hospitals were smaller, is mainly administrative, does not include cooking, and seldom covers nutrition or the relation of food to health.

Dr. Macaulay found the matrons ready enough to be relieved of the responsibility of catering; but the stewards, though agreeing that it should be under one person, were uneasy over the proposed appointment of a catering officer. They feared the results of divided control of staff, especially porters, and of stores, since food would have to be separated from other goods: and they concluded that the person responsible for catering should either be the steward or else that the catering officer should work under him.

It is doubtful whether this is the right arrangement. As the King's Fund point out, stewards have little expert knowledge of food, cooking, and the science of nutrition, and their general administrative duties do not leave them time to visit markets and interview travellers. They have to depend on the long-term contract, the written order, and the telephone in buying food; Dr. Macaulay, in fact, noted that the contract purchase was much too common. Yet a day-to-day first-hand knowledge of markets is needed for clever buying of seasonal foods, and a balanced diet can only be provided by a man or woman who understands nutrition and is free to juggle with the commodities at his disposal. Much, of course, must depend on the quality of the caterer appointed; experienced caterers are scarce, and until more have been found or trained it may be well to go cautiously. In deciding to appoint one catering manager, Middlesex County Council leave themselves free to experiment with stores arrangements and in other directions.

In addition, food service subcommittees are to be appointed in all the council's hospitals, made up of the medical director, members of the medical staff, and the officers responsible for hospital feeding, including the matron, and the dietitian and caterer where these exist. These committees will be able to reconcile the financial, medical, nursing, dietetic, and administrative interests concerned, and to deal with complaints about food. It will be interesting to see whether they develop on the lines set out by the King's Fund, as technical and

---

. Guterman, H. S. *J. Amer. med. Ass* 1946, 131, 378.
J. clin. Endocrin. 1944, 4, 262.

[1] Report of the Public Health Committee to Middlesex County Council, July 31.
[2] Second Memorandum on Hospital Diet, London, 1945.

guarantee a satisfactory service for insured persons at any scale below that which the Minister rejected, and the Joint Advisory Dental Council recommends dentists to refuse to undertake N.H.I. work unless the higher scale is adopted.

PERCEPTION

THERE are many subjects of common interest to philosophy and medicine: but if he is a physician the Manson lecturer, required by the terms of his appointment to consider some such subject, may well doubt his ability to reach the standard of subtle and recondite profundity manifest in philosophical writings. Dr. Russell Brain[1] has, however, succeeded in illuminating a problem of basic importance for the philosopher—the nature of perception, especially in its causal aspects. Neurologists, he points out, usually adopt physiological idealism as their epistemological theory: for them the only independently necessary condition for the awareness of sense-data is an event in the cerebral cortex. But, besides the familiar arguments against idealism, it is possible to object to this, as Russell Brain does, that the peculiar phenomena of cortical representation during visual perception make simple "projection" of cerebral events an inadequate explanation: "when we perceive a two-dimensional circle we do so by means of an activity in the brain which is halved, reduplicated, transposed, inverted, distorted and three-dimensional." But realism too has its difficulties, implicit in Brain's (probably rhetorical) hope that a realist philosopher will give an account of the "ontological status of a black sense-datum when it is not being perceived and, in particular, its relationship to its non-existent substratum in the physical world."

By way of hallucinations and the phenomenon of "phantom limb," which further illustrate this crux, Brain passes to the rôle of the body in perception, and instances a number of observations hard to reconcile with any variety of critical realism. Awareness of externality is clearly the cardinal problem: and spatial relations, upon which this depends, are primarily perceived in a somatocentric way. The body is well adapted to the task of spatial discrimination, through its apparatus for the integration of impulses conveyed from different sense-organs to the cerebral cortex. Russell Brain holds that the most likely explanation of the relationship between sense-data and the nervous system is that a sense-datum is a neural event which is conducted from the surface of the body to the surface of the brain but which carries with it some characteristic of the physical stimulus which excited it. In his conclusion, which takes account of the "successiveness" of the stimulus event, he adopts a realist position in so far as he denies that even secondary qualities are generated by our brains or minds: "in sensing them we are perceiving the four-dimensional texture of the external world." This is a thoughtful and stimulating essay which shows how significant for the philosopher can be the observations and reflections of the neurologist.

DEATH AFTER CURARE

AN inquest was held at Hammersmith on Sept. 9 on a patient who died after an operation in which curare was employed. A woman of 70 years had been admitted to hospital two days after the onset of symptoms of acute appendicitis. An hour after receiving morphine gr. $^1/_6$ and atropine gr. $^1/_{100}$, she was anæsthetised with 'Pentothal' 1 g. and was given 'Intocostrin' 9 c.cm. Oxygen was administered during the operation, which revealed an acutely inflamed but unruptured appendix, with much induration of the surrounding tissues and a small adjacent collection of pus. The appendix was removed, the pus mopped out, and the wound closed in layers. The first alarming signs—cyanosis and shallow respiration—appeared after the end of the operation, which had taken 43 minutes. The patient recovered somewhat with oxygen and carbon dioxide, but relapsed and, despite the injection of 'Coramine' 1 c.cm. and 'Veritol' 1 c.cm., died 35 minutes later. Necropsy confirmed the presence of early peritonitis, which was most pronounced in the right iliac fossa; there was some dilatation of the terminal loops of the ileum, suggesting early paralytic ileus. The left lung was almost completely collapsed and there was considerable collapse of the posterior halves of the right upper and lower lobes; there were one or two adhesions in both pleural cavities and the lungs showed pronounced terminal congestion. The heart muscle was a little friable, but only early atheromatous changes were found, and there was no valvular disease. Early toxic changes were seen in the spleen and liver. The kidneys were remarkably healthy for a patient of this age, although albumin had been found in the urine before operation. The pathologist considered that death was due to toxæmia and had been accelerated by respiratory failure due to curare. A verdict of death by misadventure was returned.

PENICILLIN IN WOUNDS

THE topical application of sulphonamides to wounds has proved a disappointment, and, though there is not unanimous opinion on this point, it is widely held that the presence of a sulphonamide powder in a flesh wound may actually delay healing. In sharp contrast to this, there has never been a doubt that penicillin as a topical application is of great value, for it has the advantages over the sulphonamides that it acts in the presence of pus, that its effect is not weakened by large numbers of bacteria, that it is a much more powerful bacteriostatic agent than any sulphonamide, and that it is very soluble in tissue fluids. In the early stages of its use, penicillin was recommended as a topical application because this method was more economical than systemic administration at a time when supplies were short; and many surgeons believed that, valuable as it was used thus, its effects would be greater still when easement in the supply position permitted free systemic administration. This belief has not been borne out in practice, and the paper by Florey, Turton, and Duthie in this issue gives scientific foundation for the clinical impression that locally applied penicillin is as effective in preventing wound infection as it is when given parenterally.

Florey and her colleagues collected samples of wound exudates after penicillin had been given either by local application or by injection. The difficulties they encountered in the assay of the penicillin content of these exudates and the methods they used to overcome them need not detain us here. It was shown that whereas 100,000 units of penicillin injected intramuscularly yielded for a minimum of 8 hours a wound exudate which inhibited the test organism, a similar dose implanted in the wound yielded exudates with inhibitory concentrations for at least 48 hours. It might be argued from this observation that locally implanted penicillin remained in the wound cavity but might fail to reach organisms lying in the wall, but this argument is defeated by observations on the duration of inhibitory activity in the blood and urine. There was little difference in the time over which inhibitory levels were maintained in the blood whether penicillin was given locally or parenterally, but in the urine inhibition persisted in half the cases for twice as long after local application as it did after intramuscular injection. Penicillin is therefore readily absorbed from wounds and must traverse the walls of wounds (inhibiting meanwhile organisms lying in its path) to gain access to the blood and urine.

All this is of great importance in its practical application to wound treatment. Locally implanted penicillin is of greater value, unit for unit, than injected penicillin in the control of wound infection—a conclusion which all patients will welcome if it means that the 3-hourly injection régime can be avoided. It is clear, also, that so far we have not put nearly enough penicillin into the unds we have treated and have therefore had to waste by supplementary systemic administration. Some ctical points await elucidation. Can one put into a und a large enough dose of penicillin to sterilise it h certainty at a single stroke? Do the tissues show arked resentment to pure powdered penicillin in quan- , and would healing be impeded by excessive exuda- n? If a single sterilising dose proves impracticable, at is the best method of implanting penicillin into a ured wound at, for-example, 24-hourly intervals? seems that despite the vast experience of the past six ars, the last word on the best method of treating unds with penicillin has yet to be said.

---

[1] Neurological Approach to the Problem of Perception. *Philosophy*, July, 1946, p. 133.

TEST FOR THREATENED ABORTION

THE presence of pregnandiol in the urine can be deter- ined qualitatively by a colour reaction which is neither rticularly involved nor time-consuming; and Guter- an[1] now claims that this can be used as a diagnostic st for pregnancy with an accuracy comparable to that the Friedman test. He suggests, moreover, that the action is an accurate aid to prognosis in certain mplications of pregnancy, notably threatened abortion. Pregnandiol is the excretion product of progesterone, d it appears in the latter half of the cycle, ceasing one four days before the onset of menstruation. If rtilisation occurs the corpus luteum persists and the xcretion of pregnandiol continues. In normal pregnancy he excretion of pregnandiol follows a fairly well-defined attern. At first it is comparable to that in the latter alf of a normal menstrual cycle, but about the ninth o twelfth week the excretion rises sharply to reach a eak two weeks before delivery; it then drops sharply, nd pregnandiol has completely disappeared from the rine twenty-four to forty-eight hours after delivery. t is well known clinically that the corpus luteum begins o degenerate about the third month of pregnancy, fter which double oophorectomy can be carried out without necessarily disturbing the pregnancy. It is robable that the placenta assumes the function of ecreting progesterone from about the twelfth week nwards; and the commonest time for abortion corre- sponds to the stage at which the corpus luteum is regressing and the placenta is beginning to take over its function. During this transitional period pregnandiol excretion is liable to drop to a low level; and a drop into the danger zone may well herald the onset of threatened abortion. The test could thus forewarn the clinician, who could take evasive action by ordering rest, sedative drugs, and possibly progesterone by injection.

Guterman's colour reaction[2] consists briefly in adding concentrated sulphuric acid to the pregnandiol extracted from the urine; a positive reading is indicated by a deep yellow or orange, which represents 0 4 mg. pregnandiol per 100 c.cm. of urine, or roughly 6–10 mg. in twenty-four hours—the normal amount in early pregnancy. He studied 73 patients with threatened abortion; among these the pregnandiol colour reaction with concentrated sulphuric acid was persistently negative in 39, of whom 38 aborted. The reaction was persistently positive in 34, of whom 30 did not abort. Out of the 73 there were 5 wrong prognoses; but in 3 of the 4 positives that aborted there was good reason for it—placenta prævia in two and a large fibroid in the third. The test is most useful up to the third month. Thereafter with the excretion of pregnandiol rising from 20 mg. to 50 mg., a positive reading may persist for the first twenty-[illegible] hours after fœtal death. Guterman offers no explanation of the pregnancy which continues despite a persistently negative colour reaction. The great advantage of the method is its cheapness and speed; a result can be obtained on the day that the specimen reaches the laboratory. It is hoped that English workers will try it out; if it is found to be as good as Guterman claims, it should prove useful in the treatment and prognosis of threatened abortion.

---

[1] Guterman, H. S. *J. Amer. med. Ass* 1946, 131, 378.
[2] *J. clin. Endocrin.* 1944, 4, 262.

HOSPITAL CATERING IN MIDDLESEX

BY way of experiment, the Middlesex County Council have decided to appoint a catering officer to one of their hospitals.[1] The appointment is in the first instance to be temporary, though not with any fixed limit of time, and is to carry a salary of £750 a year, rising by annual increments of £25 to £850. In a report to the public-health committee, Dr. H. M. C. Macaulay, county medical officer of health, notes that existing arrangements present many of the drawbacks discussed by King Edward's Hospital Fund for London.[2] Thus hospital catering comes under the dual control of the steward, who undertakes the buying and supervises the porters who distribute the food to the wards, and the matron, who supervises both the kitchen staff and the nurses. The matron may have the help of a housekeeping sister, whose short course of training, planned in days when hospitals were smaller, is mainly administrative, does not include cooking, and seldom covers nutrition or the relation of food to health.

Dr. Macaulay found the matrons ready enough to be relieved of the responsibility of catering; but the stewards, though agreeing that it should be under one person, were uneasy over the proposed appointment of a catering officer. They feared the results of divided control of staff, especially porters, and of stores, since food would have to be separated from other goods; and they concluded that the person responsible for catering should either be the steward or else that the catering officer should work under him.

It is doubtful whether this is the right arrangement. As the King's Fund point out, stewards have little expert knowledge of food, cooking, and the science of nutrition, and their general administrative duties do not leave them time to visit markets and interview travellers. They have to depend on the long-term contract, the written order, and the telephone in buying food; Dr. Macaulay, in fact, noted that the contract purchase was much too common. Yet a day-to-day first-hand knowledge of markets is needed for clever buying of seasonal foods, and a balanced diet can only be provided by a man or woman who understands nutrition and is free to juggle with the commodities at his disposal. Much, of course, must depend on the quality of the caterer appointed; experienced caterers are scarce, and until more have been found or trained it may be well to go cautiously. In deciding to appoint one catering manager, Middlesex County Council leave themselves free to experiment with stores arrangements and in other directions.

In addition, food service subcommittees are to be appointed in all the council's hospitals, made up of the medical director, members of the medical staff, and the officers responsible for hospital feeding, including the matron, and the dietitian and caterer where these exist. These committees will be able to reconcile the financial, medical, nursing, dietetic, and administrative interests concerned, and to deal with complaints about food. It will be interesting to see whether they develop on the lines set out by the King's Fund, as technical and professional committees, analogous to hospital medical committees, advising their hospital boards, and regularly consulted by them before any decisions are made to reduce expenditure on kitchen staff or provisions. Economics of these kinds can be expensive, whereas increases in kitchen salaries have on occasion been more than counterbalanced by savings on waste. The classic example is that published by the King's Fund in 1943 of a hospital which raised the total wages of kitchen staff from £1000 to £2000, and enjoyed a fall in the total costs of catering from £20,000 to £14,000.

---

[1] Report of the Public Health Committee to Middlesex County Council, July 31.
[2] Second Memorandum on Hospital Diet, London, 1945.

TESTOSTERONE AND ANGINA PECTORIS

MEDICAL propaganda is not without its risks, especially in the hands of an enterprising journalist. Testosterone for angina pectoris is an example of a comparatively untried treatment which has been prematurely popularised in this way. In the U.S.A. many people with angina are said to be either treating themselves with the drug or urging their doctors to prescribe it. That its worth is as yet unproved is confirmed by the latest report from America. Levine and Sellers [1] gave 25 mg. of testosterone propionate intramuscularly twice or thrice a week and 10–15 mg. of methyl testosterone sublingually every day to 21 men with angina pectoris; 11 showed no improvement and only 2 showed "marked improvement." Of the 10 patients who had male climacteric symptoms (precordial discomfort) in addition to angina pectoris 6 reported that these symptoms were much improved. Other workers [2] have reported similar results—failure to relieve angina pectoris, but relief of chest symptoms attributed to the so-called male climacteric. There seems to be good reason for the conclusion of Riseman [3] that testosterone should be classed among agents of no value in angina pectoris.

SILICOSIS AND ALUMINIUM TREATMENT

LAST year we drew attention [4] to the patenting by Canadian investigators of the aluminium treatment for silicosis. It now appears that the patent does not apply to Great Britain and that research-workers in this country are free to experiment with the method. The subject has been considered by the councils on industrial health and on pharmacy and chemistry of the American Medical Association which in April issued the following report [5]:

1. In experimental animals the *prophylactic* use of aluminium inhibits the toxic action of relatively pure quartz.
2. In man, industrial dust exposures often involve mixtures of various minerals in addition to quartz and other environmental variables to which experimental animals are not subject. Therefore human silicosis usually develops more slowly and is often modified in type. Only prolonged unbiased observation, with adequate control cases, will demonstrate whether the prophylactic results obtained with animals are applicable to man.
3. Animal experiments have demonstrated that administration of high concentrations of amorphous hydrated alumina unfavourably influences resistance to tuberculosis. While this result has not yet been reported for metallic aluminium, caution in the application of all aluminium therapy to human beings is recommended.
4. The use of aluminium might appear as an easy short-cut to healthful working conditions, thus saving large expenditures for ventilation and other control methods. Actually there is no substitute for the accepted methods of dust control.
5. If industry indiscriminately treats all employees with aluminium dust there may be aggravation of tuberculosis or other pulmonary conditions.
6. The *therapeutic* use of aluminium in man appears to relieve symptoms in a very small number of cases in which silicosis develops rapidly. Experience in some groups is more favourable than in others.
7. In view of these considerations it is recommended that the general application of aluminium therapy in industry be delayed until adequately and impartially controlled clinical observation demonstrates its effectiveness in preventing or alleviating silicosis in man. In the meantime, there should be no slackening in the control measures that have been found effective in reducing the incidence of dust diseases in industry.

We agree heartily with this opinion and repeat that the "results of treatment and prevention of silicosis by the aluminium method, while suggestive, are not yet convincing, and much more work by independent and untrammelled observers is needed to establish its efficacy." We hope too that the freedom of this country from the effects of the Canadian patent will not result in the indiscriminate establishment of aluminium inhalation chambers at factories or other places where there is risk of silicosis. The only established method of preventing the disease is by seeing that workers *do not breathe* the dust of free silica.

---

[1] Levine, E. B., Sellers, A. L. *Amer. J. med. Sci.* 1946, 212, 7.
[2] Goldman, S. F., Markham, M. J. *J. clin. Endocrin.* 1942, 2, 237. McGavack, T. H. *Ibid*, 1943, 3, 71.
[3] Riseman, J. E. F. *New Engl. J. Med.* 1943, 229, 670.
[4] *Lancet*, 1945, i, 441.
[5] *J. Amer. med. Ass.* 1946, 130, 1223.

FATE OF THE NERVE HOMOGRAFT

TRIALS by Seddon and Holmes [1] of nerve homografts for bridging gaps in injured peripheral nerves indicate that, despite its success in cats, rabbits, and monkeys,[2] the method is ineffective in man. Barnes and his colleagues [3] have also made a careful investigation of homografts in 8 cases of peripheral-nerve injury where the gap between the divided ends of the nerve could not be bridged by any other method; in no case was there any recovery of neural function. At varying intervals after insertion, when it was apparent that no recovery was occurring, the wound was explored and the graft inspected. In 3 cases the graft was removed and studied histologically 140, 355, and 904 days after insertion. In all 3 cases regenerating nerve-fibres crossed the suture line and penetrated the graft for varying distances, the greatest being 25 mm. In the graft there was necrosis of the fascicles and some fibrous replacement, the extent of which appeared to depend on the time that the graft had been in place; in the third case, examined at 904 days after insertion, there was dense fibrous tissue and no evidence of the original graft elements.

Barnes and colleagues point out that the reaction to a homograft differs fundamentally from the reaction to an autograft. The fibrous replacement of a homograft appears to be due to a reaction of the host's tissues; with an autograft the architectural characteristics of the graft are maintained, and fibrosis results from the proliferation of its connective-tissue elements. Why a homograft undergoes necrosis and fibrous replacement is still uncertain; Barnes and colleagues suggest that it is the result of "active acquired immunity"—a view originally expressed by Gibson and Medawar [4] in relation to skin homografts. Seddon and Holmes think that where the gap is short, as in the rabbit, the tissue reaction may not occur until outgrowing fibres have reached the peripheral stump, and that in man, where the gap may be long, the immune reaction attains its greatest intensity long before the fibres have had time to traverse the gap.

Until more is known about the mechanism and control of the host's acquired immunity, the nerve homograft will find no place in the surgery of peripheral-nerve injuries.

---

[1] Seddon, H. J., Holmes, W. *Surg. Gynec. Obstet.* 1944, 79, 342.
[2] Bentley, F. H., Hill, M. *Brit. J. Surg.* 1936, 24, 368. Sanders, F. K., Young, J. Z. *J. Anat., Lond.* 1942, 76, 143. Bentley, F. H., Hill, M. *Brit. med. J.* 1940, ii, 352.
[3] Barnes, R., Bacsich, P., Wyburn, G. M., Kerr, A. S. *Brit. J. Surg.* 1946, 34, 34.
[4] Gibson, T., Medawar, P. B. *J. Anat., Lond.* 1943, 77, 299.

Reconstruction

HEALTH EDUCATION

ITS PROBLEMS AND METHODS *

WALTER P. KENNEDY
Ph.D. Edin., L.R.C.P.E., F.R.S.E.
MEDICAL OFFICER, MINISTRY OF HEALTH

HEALTH education is a comparatively new subject. t has not yet been formulated in doctrine and pedagogic methods, as has been done with the older disciplines, uch as botany and chemistry. To say this is not to isregard the work of those devoted medical men and dministrators, such as Heberden, Fothergill, Smellie, Snow, and Chadwick and Simon, who laid the basis of scientific hygiene and gave it practical expression in public-health legislation.

The labours of the early hygienists involved convincing the public so completely that their discoveries were correct that the result was a general demand for egislative action and an acceptance of the laws when they were made. This meant instruction in the requirements for health, and it is the democratic method. But a glance at the history of preventive medicine or hygiene in modern times is enough to show us the main grounds for the claim that health education is a new subject.

The preoccupation of hygiene is with the prevention of disease—and very properly so—while the preoccupation of the new health education is with the promotion of health. The difference is that between a negative and a positive point of view. It is true that health education could not have developed as an idea without the prior creation of a firm foundation of preventive medicine, but it is an extension from the older concepts of the hygienists and sanitarians, and it has its separate contribution to make to national welfare.

The time seems ripe to attempt at least an elementary analysis of the general concept and to formulate principles for its further development. The following views are presented as no more than a hypothesis upon which a thesis may later be made. They are far from complete, but their purpose will be accomplished if they only act as catalysts to stimulate discussion among other workers in the field.

DEFINITION

It is of first importance in any discussion to be definite about the meaning of the terms used ; so we must make a semantic examination of the word " health." This is not easy, for health is a state of being and, as a biological phenomenon, is in a continual condition of flux. Some time ago I looked up the definition of health in all the dictionaries and textbooks at hand, and could not find a single definition which satisfied the criteria laid down in formal logic. For example, to say that health is "wholeness or soundness of body and mind" does not really take one any further. At last it appeared that the method of classical logic was inadequate to supply the required answer. It was necessary to apply the logic of the continuum as, for example, used by Bogoslovsky.

For the purposes of this dynamic logic we will postulate that we can only consider health by also considering its opposite, disease. This pair of contrasting concepts may be regarded as opposite poles joined by a line along which we can measure the distance of any point from health at the one end, or from disease at the other. Any scale of gradations can be chosen. This is what is meant by a logical continuum. It is not a far step to see that the ultimate of disease is death and (applying the method of contrasting opposites) the ultimate meaning of health is life in the fullest and most complete and perfect sense of the word.

But a complication must be added if the model is to be adequate. Health and disease are not a simple pair of contrasting opposites like heat and cold. They are made up of immense numbers of components involving the body, the mind, and the spirit. Thus the imaginary line of the continuum becomes a rope of innumerable strands. At first sight this may seem a tortuous and perhaps pointless piece of speculation, but it does provide a basic model on which to found the reasoned structure of the principles of health education. We cannot indeed escape the necessity for such a model, and it is surely not contentious to hold that, if real advances in this subject are to be made, the pragmatic method, which has served its part, must be replaced by sound first principles.

Health, then, is a state which can be measured. In practice it is quite common to find approximate measurements being made. The medical examination of Service recruits, the much more exacting annual flying board for pilots, the life-assurance examination, and mass nutritional surveys are all examples of such approximations. These would all appear crude if compared to the total tests and measurements which modern medicine and psychology could apply, were there sufficient time and staff to do it. But they are enough for their especial purposes.

If a population large enough to give statistical significance is examined by such methods, a norm or average can be established which is a measure of the so-called " normal " health of the group within the limits of the measurements. But this is not to say that such a normal is the *best* or even a proper state of health for such a population. It is hardly necessary to point out that any such standard norm for a group selected from the British or any other people would fall far below the norm which could possibly be attained by attention to the rules of healthy living, good dentistry, complete nutrition, individual education in place of conveyor-belt methods, and so on. This is still true despite the enormous betterment in national health and fitness, expectation of life, stature, and the like, which have been brought about by preventive medicine in recent years—and which, we may well be proud to say, continued to improve during the war.

THE FIRST BASIC PRINCIPLE

It can be postulated, then, that such a norm of health exists for any population, and any deviation below this norm can be called negative, any deviation above, positive. The validity of this concept is demonstrated further by applying to the measurements a Gaussian curve, or indeed a frequency-distribution surface, although I shall not here extend this argument. But in the doctrine of positive health we have the first basic principle which is the essence of the new attitude in health education. It is that health is more than just the state of not being ill or of having no complaints or disabilities ; moreover " ordinary " health can be improved, though preventive medicine alone is not enough. The idea of positive health indeed points the way to constant improvement. The fullest use and enjoyment of life is only possible through the fullest use and enjoyment of health. This is at once true of body, mind, and spirit, which leads to the second basic principle of sound health education.

THE SECOND

This is the principle of holism, which I have found best expounded in that most important book *Holism and Evolution*, by General Smuts. To put it in the simplest way, if we talk about man in the physical sense, everyone will agree they understand what is meant ; but if we ask whether the term " man " includes his mind, or still more his soul, the argument starts. Yet from the holistic point of view we must regard man as a triad of body, mind, and spirit, just as psychologists (of the classical school at least) treat the mind as a triad of will, emotions, and intellect. But these are coexistent and interdependent. They cannot be separated one from the other except for dialectic convenience. They are not autarkic entities, for this would deny the principle of solidarity. Similarly, a study of anatomy without some physiology, especially neurophysiology, would be completely meaningless; while physiology could not be studied at all without at least an elementary knowledge of anatomy, for structure and function are inseparably related. Taking this circle method of categorising one stage further, the life of man could be described as a complex of the vegetative, motor, intellectual, moral, and reproductive—and these merge at some points. Part of the reproductive life of man is vegetative, part of it is concerned with morals and so on.

---

* A Chadwick lecture given in London on Oct. 30, 1945.

The main point is that, while we admittedly sectionalise knowledge and observations, this is only a matter of convenience, a sort of intellectual shorthand. "Separate" sciences are really closely enmeshed together. Advances in one produce alterations in the others, and there is a fluid equilibrium between them. So, too, the health of man is a whole thing and conterminous with his life. In studying it this should always be remembered, though commonly it is disregarded. For example, there is the type of fallacy we may call unitarian, such as is held by the faddist who has a diet cure for all ailments, or the person who treats every ill as imaginary, the so-called Christian Scientist.

It is necessary, then, for health education to be concerned with more than the inculcation of habits of cleanliness, temperance, exercise, and the like. The old saw "*mens sana in corpore sano*" has its corollary, "*corpus sanum in mente sana.*" Equally it must be remembered that the moral outlook is intimately connected with the health of both body and mind.

THE THIRD

The third principle of health education is not easy to name satisfactorily, but for present purposes we may call it the principle of motive or aim. It is designed to provide the force or energy for carrying out whatever procedures may be necessary to obtain health. The principle shows that in planning health education it is not sufficient to instruct people how to improve their personal or community health. It is necessary at the same time to convince them that it is really worth paying the price in effort, time, and perhaps money to obtain these benefits. This may at first sight appear so obvious as to be out of place in such a discussion, but unfortunately this is not so. Ask anyone if they want to be healthy, and the unhesitating reply is that they do. If this question is followed by a supplementary query about what they are now doing to promote their health, the answer is seldom so prompt.

It is true that some people will reply that they brush their teeth after meals and take open-air exercises when they can, and so on, and, in an occasional instance, if one has chanced on a faddist such an inquiry may open floodgates of enthusiasm. But only an insignificant proportion of the population make any effort to improve their physical and mental health and efficiency, unless illness has brought home to them the handicaps of disease.

Health education, then, must not only instruct but also convince people that health is worth having. The fact is obvious, as everyone will admit; but it is one thing to accept the validity of a general statement intellectually, and quite another to accept it emotionally as well. If our instruction is to produce the best results, it must create converts to the idea and imbue them with the fervour usually associated with the phenomenon of conversion. The formula then is:

(1) health is worth having,
(2) ordinary health can be improved by the expenditure of effort, and
(3) the expenditure of this effort pays real dividends.

I do not apologise for hammering at this point, obvious though it may seem. It is a common enough experience for people to be fired by the enthusiasm of a physical-culture expert on the radio, or perhaps a writer in a women's paper who promises beauty, charm, and a handsome husband for, say, five minutes' deep breathing a day. The course of exercises or massage or whatever it may be is started at once and kept up with fervour for at least three days. How reminiscent this is of the parable of the seed that fell on stony ground.

THE FOURTH

The fourth principle of health education is that of use. We must use our faculties, or they gradually fade. The Indian fakir may hold his arm above his head for years, and the muscles atrophy and the joints ankylose so that he cannot lower it even should he wish. A small boy may attain some competence at the piano in three or four years and then give it up, only to regret as an adult that he is just able to pick out "Swanee River" with one finger. These are examples of atrophy and disuse.

Few people develop and use their physical and mental powers in the most efficient way, and improvement is nearly always possible. The fact that athletes train specially before a big event is evidence of this. One can learn to walk a tightrope, or perform the difficult gyrations of the ballet dancer, if one sets one's mind to it. This does not mean that everyone should practice acrobatics or aspire to dance "Petroushka." It is instanced as an example of how physical capacities can be expanded (naturally, variations in physical and mental endowments make some people more fitted for a given activity than others). It is equally true of the mental faculties, whether one tackles the solution of mathematical problems or the harder task of swaying the House of Commons by impassioned eloquence. A combination of application and practice will improve one's facilities for dealing with either contingency.

This principle can be taken a step further, for it must be applied equally to the soul. Admittedly this is an unsatisfactory terminology, but the point to be made is that no person is completely healthy unless he has a sound moral discipline. Whether this be entirely from without, or from the wells of a man's own conscience, or a combination of the two, is irrelevant. The essence of the matter is that this moral discipline must exist. It has been remarked with surprise that during the war there was a decrease in neuroses, and the anticipated increase of mental ill health did not develop. Though it is easy to fall into the fallacy of post hoc, propter hoc, I am convinced that this reduction sprang from the same origin as did both the increase in the obvious unselfishness of people, and the warmer spirit of neighbourliness which was experienced especially in the bombed areas. The stern necessities of the time imposed a stronger moral discipline, and it is my opinion that this brought with it an improvement in mental and perhaps also physical health.

An obvious example of the value of moral discipline is in the realm of sex, where control is particularly difficult because of the deep roots of the instinct, and because of the repressions which have followed inevitably from the development of our culture. No-one of experience will deny that the sex aspects of life affect health in many ways, and equally those experienced in dealing with these problems will agree that the appeal to expediency is inadequate to determine healthy sex behaviour.

The rôle of moral discipline cannot be neglected; whether it is religious or strictly ethical is a matter for the individual about which one has no right to be dogmatic. It is, however, perfectly legitimate to insist not only that it is important but also that it is essential.

METHODS OF PRESENTATION

Despite an extensive search I have been unable to find any study which takes a comprehensive view of the methods of health education. The nearest is a book by Williams and Shaw entitled *Methods and Materials of Health Education* (New York, 1937), but it does not go into the detail which seems desirable. We need an evaluation of the relative effectiveness of the different methods of propaganda, from lectures to health weeks, particularly in respect of their impact on different age-groups or social groups and their applicability to the type of message which has to be given. A study of this nature is urgently needed. Techniques exist for carrying out such an investigation and have been developed widely in America in the field of merchandising research. Some information of this kind has been collected in relation to the Ministry of Health's successful campaign for diphtheria immunisation, but we need more general research.

A system of classification should be the first step in planning a campaign of health education, whether it be extensive or intensive. Different systems of classification may be used; for example, we may divide the problem into one of school and adult education. The former falls into three subdivisions of infant, elementary, and secondary, and university and technical college groups. The adult education would subdivide into general, comprising city- or nation-wide campaigns, and special, covering the instruction of small groups such as St. John Ambulance detachments, Women's Institutes, or patients attending a maternity and child-welfare centre. A second type of classification, parallel with the first, categorises the methods of instruction: oral (lectures, discussions, radio), visual (posters, advertisements, pamphlets, cinema, and exhibitions), and a comprehensive class of "health-weeks." One might include in this list the provision of amenities, such as swimming-baths, gymnasia, and sports grounds; but the implications of this are wider than the strict field of health education. A third system of classification, which would be useful in devising a scheme for health education, would be to enumerate the people and organisations involved in conveying the message—doctors, teachers, sanitarians, societies, and associations of various kinds.[1]

In the absence of an analysis of actual observations an opinion carries little authority; but, if only to invite contradiction, I say that the oral approach is more effective in adult education than is the visual; radio and lectures appear more effective instruments than do advertisements or posters. The success of Sir Wilson Jameson and of Dr. Charles Hill on the air has been outstanding. The position of the cinema, however, is anomalous, because it combines both types of instruction, yet in this medium the visual element predominates over the spoken. There are great potentialities in the development of health-propaganda films, but the standard of technical achievement in this field has not advanced so quickly as it might well have done. Admittedly the techniques are in the difficult stage of formulation, but with two exceptions the standard of health films I have seen is poor. The main reason appears to be that they have been made for non-commercial purposes under the direction of a committee of some society or association.

If the health film is to have an effective future, its structure must be regarded far more as a matter for professionals than has been the case in the past.

THREE LINES OF ACTION

There are three practical lines of action which are essential for making the most of health education.

The first is the provision, especially in the small centres of population, of more swimming-baths, gymnasia, and sports facilities. These are the workshops of health. In a recent visit to Germany I was impressed again by the way in which small towns were supplied with these amenities. Some hymn-writer once complained that it was not right that the devil should have all the best tunes. Equally we should not allow our fascist enemies to be able to claim that in such ways they did more for the people's health than does the stronghold of democracy.

The second point is the necessity for training more teachers in biological science and methods. Hygiene is an obligatory course in American schools, and many feel that this country lags deplorably in neglecting this study. But, unless fully trained teachers with a biological outlook are available, it is futile to introduce the subject. More harm than good would result if the ordinary teachers were given a *Reader in Hygiene* to go through with their classes. Prof. Lancelot Hogben has more than once put forward the demand that the universities' biological departments should review their instruction and train more students in general biology. The aim would be dual—to provide more biology teachers for schools, and to give all university students some knowledge of the science of life as an integral and essential part of cultural education. The educationist who would disagree with this proposal would be indeed a bold man.

Finally, there is no doubt in my mind that the churches should be coördinated more closely with the aims of national health. It has been shown that, from the holistic point of view, one must consider the moral aspect of human life with the physical and mental, and the point needs no amplification. It need only be added that the community group of the church congregation provides an admirable nucleus for concerted action. People of like conviction associate together easily, and the connexion with the church is advantageous in many ways. Within the church and outside it many voices are growing increasingly insistent that the church should pay a more vital contribution to the nation's life. Participation in health education is not merely another way in which this could be done. I submit that it is an essential duty for the churches to interest themselves in this matter, for life and health are a single whole, and no health education can be complete unless it includes in its ambit the physical, mental, and the moral activities of man.

Obituary

KARL NARBESHUBER

M.D.

Obermedizinalrat Karl Narbeshuber, who has died at Gmunden, Austria, in his 79th year, was a former president of the Austrian Medical Association. A true Austrian and a friend of the British, he was no doubt a marked man in the eyes of the Nazis, and no sooner did the Anschluss come than they took their revenge, treating him with cruelty and indignity. Hauled out of his bed on the first night he was thrown into prison, his life was threatened, his head and beard shaved, and he was deprived of his civil rights, property, and practice, and separated from his family. When Austria was freed he returned to his native town of Gmunden and once more devoted himself to his duties as Stadtarzt. But age and the privations of war had affected his health and he died on August 28.

A lovable man of wide learning and an exceptional linguist Dr. Narbeshuber did much for the British prisoners during the first world war. He often visited London, and many English doctors have enjoyed his agreeable hospitality in Austria.

J. A. H. B.

---

[1] See Kennedy, W. P. *Hlth Educ. J.* 1945, 3, 69.

Special Articles

BRITISH-SWISS MEDICAL CONFERENCE

THE conference organised by the Swiss Academy of Medical Sciences and the Royal Society of Medicine opened in the hall of the ethnological museum of the University of Basle on Sept. 16. Of the 280 doctors present more than 150 had come from the United Kingdom. Prof. A. GIGON, secretary-general of the academy, who first proposed a conference of this kind, introduced Prof. KARL WEGELIN, the academy's president, who said that the aim, as at last year's Franco-Swiss conference in Geneva, was to foster international relations. Welcoming the British visitors he recalled the ancient political and cultural bonds between the two countries which had remained unbroken since the seventh century. For Switzerland he expressed satisfaction at the end of the intellectual isolation enforced by the war. Bundesrat ETTER, on behalf of the Swiss Federal Council, paid a tribute to British tenacity in the war and recalled what had been done since then to strengthen the links between his country and Britain. He mentioned in particular Switzerland's help in the difficult post-war period—for example, she had invited 400 British children to stay in the country. Other speakers at the opening meeting were Mr. T. M. SNOW, the British minister in Berne, Monsieur PAUL RUEGGER, the Swiss minister in London, Prof. EDGAR BONJOUR, rector of Basle University, Regierungsrat Dr. MIVILLE, representing the authorities of Basle, and Lord AMULREE, representing the Minister of Health, who recalled the world's debt to Switzerland for the International Red Cross and for her fine conception of political liberty. Prof. J. B. HUNTER, Prof. J. H. DIBLE, and Dr. ALAN DRURY, F.R.S., of the British organising committee, emphasised the need for collaboration between the two countries and expressed thanks for Swiss hospitality.

After the formal opening Sir HUGH CAIRNS read a paper in German on Investigations on Head Injuries in Britain during the Second World War. Other papers were given in English with a simultaneous translation into German.

The afternoon session, under the chairmanship of Sir LEONARD PARSONS, was opened by Prof. LUZIUS RUEDI, who spoke on Acoustic Trauma, of which he distinguished four types which could be classified according to loss of function into two groups: the first group comprised noise trauma, report trauma, and certain blunt head injuries, and the second explosive trauma. He went on to describe an ear defender which he had designed, containing a resonator; its effect was to damp down frequencies between 2000 and 7000 cycles per second without seriously interfering with hearing. Repeated experiments had proved the complete efficiency of this defender which he suggested could be usefully applied in industry.

CIRCULATORY FAILURE

Dr. JOHN McMICHAEL (London) said that the old "back-pressure" view of cardiac failure was based on the mistaken idea that the veins are inert tubes. Thirty years ago Starling showed, by means of his heart-lung preparation in the dog, that the most important single factor determining cardiac output is the venous inflow; up to a certain point elongation of the cardiac muscle increases its capacity for work, but beyond that point output falls. Harrison, in 1935, suggested that the output of the heart might not be very much lowered in heart failure, and in 1938 Dr. McMichael reached much the same conclusion. In the early stages of failure the resting output may not be significantly lowered, but the capacity to increase output is diminished. Only later does the output fall, and then usually to not less than half the normal resting value. The measurement of right auricular pressure by a ureteric catheter, first practised by Cournand in New York, has proved a safe and effective means of estimating cardiac output and filling pressure, and has been employed without mishap in over 500 cases by Dr. McMichael and his colleagues. The new method has confirmed that in the ordinary forms of heart disease, from valvular defects or hypertension, the resting output is maintained and the first rise of venous pressure takes place when the output is only slightly below the normal average. This rise is thus not the back-pressure effect of a falling output but a compensatory mechanism to maintain the optimum output as long as possible. In the later stages of failure the venous pressure is considerably raised and the cardiac output reduced to about 3 litres a minute. In the failing heart digitalis reduces the venous pressure and increases the cardiac output, though in the normal heart the reduction of venous pressure is accompanied by a fall in output. In auricular fibrillation rate-reduction is not of primary therapeutic importance; the major benefits of digitalis are achieved by reducing the venous pressure, and a mechanical reduction of venous pressure will produce as great an improvement as digitalis.

Discussing the conditions in which a high cardiac output is required to oxygenate the tissues, Dr. McMichael said that Sharpey-Schafer has shown that when the hæmoglobin falls below 30 % the cardiac output may need to be doubled and this can be accomplished only by a high venous pressure and a simultaneous increase of pulse-rate. At this stage the patient's condition is precarious, and venous congestion and œdema may be pronounced. Digitalis will lower venous pressure and cardiac output, so reducing the supply of oxygen to the tissues and making the patient worse; transfusion, on the other hand, will raise the right auricular pressure but reduce the cardiac output, and this may result in death from heart failure, owing to pulmonary œdema. If transfusion is necessary to save such a patient's life it must be given slowly, possibly combined with digitalis. The danger lies in raising the venous pressure, which is set at the optimal level, so the anæmic patient should be treated with liver or iron, as far as possible avoiding transfusion. In *cor pulmonale* the output is usually high for a reason similar to that in anæmia—i.e., the available oxygen in the arterial blood is considerably reduced. Here digitalis is not only useless but dangerous. High-output failure has recently been observed with generalised Paget's disease, in a man of 66. The blood-flow through the normal skeleton, measured by Prof. O. G. Edholm with the plethysmograph, is about 100 c.cm. a minute, whereas in Paget's disease the total skeletal flow is between 3 and 4 litres a minute. The circulatory state is thus a result of the enormous increase in skeletal circulation.

The classical pre-war conception of shock has been modified; the view that blood is pooled or trapped in some part of the vascular system has been discarded. Hæmorrhage is the major factor in war wounds; hæmoconcentration does not occur except in burns and crush injuries and some types of abdominal injury. Wallace and Sharpey-Schafer have shown that, after the loss of 1000–1200 c.cm. of blood, full blood-dilution is not attained for some 40 hours. Blood-volume may be reduced in chronic anæmia, and this state is associated with an increased cardiac output. In hæmorrhage the pressure falls in the great veins, the cardiac output falls, the pulse-rate is accelerated, and the peripheral resistance is increased. After this first phase there may be a vasovagal reaction, owing to sudden vasodilatation in the arterioles of the skeletal musculature, with reduction in pulse-rate and blood-pressure. Recovery from this reaction, whose purpose is obscure, may be hastened by 'Methedrine.' D. W. Richards has shown that in the average case of shock the cardiac output seldom falls below 3 litres a minute; the deep fall in blood-pressure is due mostly to lack of vasoconstriction, for which hitherto ill-defined factors in addition to the vasovagal reaction may be responsible. Oxygen is worthless as a means of overcoming the defects of sluggish blood-flow in shock. Recent observations suggest that in shock with overwhelming infections the regulation of venomotor tone may be impaired and a suprarenal cortical mechanism may be involved somewhere in the chain of events. Other types of non-surgical shock—e.g., the collapse of diabetic coma and coronary thrombosis—should be approached by the new methods.

Observation suggests that peripheral vasodilatation and a high cardiac output are present in the early stages of diabetic acidosis.

ŒSTROGENS IN CANCER

Prof. E. C. DODDS (London) recalled the steps which led to the synthesis of stilbœstrol, hexœstrol, and dienœstrol as the result of collaboration between Sir Robert Robinson and his colleagues in Oxford and Professor Dodds's own department at the Middlesex Hospital. Animal experiments have shown that these three substances can replace all the known activities of the naturally occurring œstrogens. They have now been widely used clinically for the treatment of menopausal symptoms, amenorrhœa, and dysmenorrhœa, and for the termination of lactation. Their great advantage lies in the fact that they are active by mouth and cheap to produce. The possibility of using œstrogens in the treatment of carcinoma of the prostate was first mooted by Huggins and his colleagues in 1941. Castration for the relief of prostatic carcinoma was originally advocated by John Hunter, who observed that the gland would shrink when the testes were removed. However, the operation had so many objections from the patient's point of view that it was rarely performed. In the four years from 1939 to 1943 Huggins treated 69 patients with advanced carcinoma of the prostate by castration combined with the administration of œstrogens. The synthetic œstrogens were found to be perfectly suitable for this purpose. Œstrogens were administered to patients who did not obtain a long remission of their symptoms after castration and to those in which the serum-level of acid phosphatase, though considerably reduced, did not drop to normal. In most cases the treatment relieved pain and frequency of micturition, and improved the patient's general condition: in some cases there was a reduction in size of the primary tumour and the secondary deposits. Other workers in Britain and America have treated carcinoma of the prostate with œstrogens alone and have confirmed Huggins's findings. About 95% of cases respond in some degree, but the improvement is not always maintained and many cases will have to be classed eventually as delayed failures. No serious worker in this field would claim that synthetic œstrogens will cure carcinoma of the prostate, since if treatment is interrupted the disease begins to progress again as before. But the treatment is more than mere palliation; the benefit obtained, even if only temporary, constitutes a definite arrest if not a regression of the disease. Side-effects reported from the administration of œstrogens include swelling, tenderness, or soreness of the breasts, nausea, vomiting, and occasionally soreness of the testes. As a rule these effects are not serious enough to require cessation of therapy and they are generally far outweighed by the benefits obtained. The dosage of synthetic œstrogens is 1 to 5 mg. per day.

The exact mode of action of œstrogens in carcinoma of the prostate has still to be worked out. The changes in the serum-level of acid phosphatase indicate that the metabolism of the malignant cells is interfered with. This enzyme is present in large quantities as a secondary sexual characteristic in the adult prostate, and its presence depends on the activity of androgens. The serum-level of acid phosphatase was shown in 1936 to be abnormally increased in some men with metastatic carcinoma of the prostate, and in 1941, Huggins demonstrated that the level can be reduced either by orchidectomy or by the administration of œstrogens. He also pointed out that in many cases a malignant prostatic tumour is due to hypertrophy of adult epithelial cells which are acted on by androgens. He therefore deduced that if the activity of androgens could be inhibited, either by removal of the testes or by the administration of œstrogens, then the growth of these cells would be interfered with and the tumour and possibly the secondaries would regress. A possible explanation for the occasional failure of œstrogen therapy is that these tumours may be due to the malignant development of other cells over which androgens have no control. A further explanation is the existence of an extragonadal source of androgens, possibly in the adrenal cortex. It is still doubtful whether, in addition to the inhibition of androgens, the synthetic œstrogens exert some definite controlling influence on the malignant cells themselves. Biopsies on cases before and after treatment with stilbœstrol have revealed characteristic changes in the cells, different from those caused by irradiation.

Until the action of synthetic œstrogens in prostatic carcinoma is explained it is impossible to forecast the likelihood of success in carcinomas of other parts. Some success has been obtained in carcinoma of the breast—of 168 cases reported by various workers, 41 were improved, and in 6 the improvement was "spectacular"—and again the question arises whether the improvement is due to a change in the endocrine balance or to the specific action of the drug on a certain type of cell. A committee has been set up by the Royal Society of Medicine and the British Empire Cancer Campaign to investigate a large number of cases of carcinoma treated with synthetic œstrogens and to follow them up over a long period. The report of this committee cannot appear for some years, but it is hoped that it will yield valuable information on the type of case most likely to be benefited and the reasons why such benefit is to be expected.

A VISIT TO FINLAND

W. P. GURASSA
M.B. Lond.

F. L. JACKSON
M.B. Lond.

WHILE on a visit to Stockholm, in March of this year, we were assisted by the British Council to visit Helsinki, so that we could see something of the medical work there and meet some of the students and young physicians.

The journey across the Baltic was an entirely new experience. The sea was frozen almost all the way over, so that even with the assistance of icebreakers progress was slow. Several times the ship jammed in the ice and we arrived at Abo many hours late. But the weather was wonderful—cold and crisp with brilliant sunshine. This, with the spectacle of myriads of tiny islands, made the journey a delight.

The train journey to Helsinki from Abo was not so pleasant. We left Abo early in the morning, without any breakfast. Finnish restaurant food is bad. We were offered some tiny scraps of rye bread with a little fish roe on them, but could not face them, so we sustained ourselves with some sugar which we had brought from Sweden. Later, when the train stopped for a quarter of an hour at a station we ate some potato, which in our then famished state seemed extremely good.

At Helsinki we were met by the assistant professor of radiology from the General Hospital and two students, one of whom was a Swede who spoke fluent English and acted as our guide during our short stay. We were taken immediately to see Professor Holsti, the professor of internal medicine, who entertained us generously, both at the hospital and at his home. He spoke excellent English, having studied for some years in America, and in true American fashion had prepared for us a very full programme designed to show us as much as possible.

At 8.30 on the first morning we attended the radiology department, where we saw some films showing opacities in the lungs of patients with typhus, early in the attack before the appearance of the rash; these opacities are fleeting, and should be sought specifically. Another interesting film of the chest showed the characteristic ground-glass appearance of asbestosis. We were impressed by the quality of the work and the enthusiasm of the staff.

Next we were conducted round the Polyclinic by Professor Holsti. We saw several cases of Buerger's disease, one in a patient of 17 years, and were told that it is common in Finland. Another condition of which we heard much was dibothriocephalus infestation, and we were each presented with specimens of the worms to bring back to England. This, however, was probably unnecessary, since after eating some of the fish obtainable in Finland—raw—we probably now harbour sufficient of the parasites ourselves! The morning concluded with visits to special departments for the treatment of cancer, chiefly by radiotherapy, and the newly formed allergy clinic under the direction of Dr. Erikson-Lihr, the first of its kind in Finland.

A national scourge in Finland is tuberculosis, the annual mortality-rate being 17 per 10,000. Dr. Severi Savonen, who is in charge of the tuberculosis services in Finland, told us that the war had brought a halt to the previous decline in the mortality-rate. As elsewhere in Scandinavia, B.C.G. inoculation is widely used, on a voluntary basis. Infants are inoculated, where possible, in the obstetric clinics soon after birth, and special homes are provided for the isolation of infants from open cases. Savonen believes that inoculation produces excellent results and does not give rise to ill effects. At Christmas time, money for anti-tuberculosis work is raised by the sale of coloured stamps which are stuck on the letters in addition to postage stamps.

Later, Professor Holsti initiated us into the mysteries of the Finnish steam bath (sauna), which is widely acclaimed as responsible for the toughness of the Finns, endowing them with a spirit of unbounded energy and stubborn determination (sisu). Many people have their own steam baths, and Professor Holsti's was in a rough wooden shack in his garden. In the corner burned a fire, and water drawn from a near-by trough was cast on to it so that clouds of steam billowed into the room. It is the custom to lie outstretched on wooden shelves and perspire freely. From time to time one washes with cold water, or beats oneself with a sheaf of leafy twigs which have been dipped in cold water. Then the heat increases. When one feels sufficiently relaxed one runs outside and rolls in the cold snow for a minute or two. This closes the skin vessels and facilitates drying. We dried without this severe preliminary act, but watched amazed while the professor's son and our Swedish guide performed it.

Next morning we visited the neuropsychiatric institute at Lappvik, where we were conducted round the wards by Dr. von Bagh who addressed us in French. This institute is over 100 years old, but its construction is good. The wards and corridors are light and airy, and, as in most Scandinavian clinics, there are few patients in each room (3–6). We saw many cases of disseminated sclerosis, and it was claimed that fairly good temporary results were obtained by pyretotherapy. Prefrontal leucotomy has recently been introduced in Finland, being used particularly for the treatment of chronic obsessional states. We saw the first case so treated at this hospital.

We learnt something of the poor food situation both from personal experience and from accounts given to us by medical men. Bread is of the poorest quality, dark, coarse, and bitter, and is strictly rationed. Milk is rationed to 600 c.cm. per person per week, butter to 500 grammes a month, and no other fat is obtainable. Meat is rarely seen. The staple diet consists of potato, bread, and fish. There is, however, a large black market in food for those who can afford it. Most of the people look thin and ill clad, and Helsinki, once proudly called the "White City of the North," shows signs of neglect and dilapidation.

On our last evening we were entertained to dinner by the Medical Association. We gave them some account of our medical studies in England, and many of them expressed a desire to visit England later on. We have brought back many pleasant memories of Finnish hospitality.

The Finns look with confidence and determination to the future—their "sisu" is no myth—and they will strive hard to restore prosperity to their land.

ARMY REFRESHER COURSES IN GERMANY

At the end of the late war the university clinic at Göttingen, with its 2000 beds, was found to contain a remarkable selection of clinical material. In the ensuing months Major J. M. McFie and Major H. O. McLaren, the medical and surgical specialists attached to a nearby casualty clearing station, paid repeated visits to the clinic, with which they were so impressed that they suggested that refresher courses should be held there for medical officers, particularly those on general duty; such courses, they thought, might encourage postgraduate study. The proposal was warmly supported by the director of medical services, and the consulting physician and surgeon, 21 Army Group; and the first course was held from Nov. 18 to 24, under the direction of Major McLaren, who was later succeeded by Captain P. E. H. Jones.

CLINICAL TEACHING

The clinical teaching was given by the university staff. Few of these spoke fluent English and most officers had difficulty in following explanations in German; direct interpretation was tedious and sometimes misleading. A German-speaking specialist officer, R.A.M.C., was therefore appointed chairman-interpreter. Case-notes were abstracted and translated into English, and the translation was circulated with the original notes in German, which, with even slight knowledge of the language, provided a good deal of information.

Cases were chosen with straightforward clinical signs to illustrate common disorders. In the medical and surgical clinics each officer was allotted a long case, with twenty minutes for examination, followed by five minutes in which he summarised his findings before the whole class, and a further five minutes for the professor's comments. Short cases were also shown. Midwifery and gynæcology were handled on much the same lines. Post-mortem demonstrations were included; and for a short time each day the Germans demonstrated their own recent advances. The morning break and a further period at the end of the day were used for discussion: time at the clinic was often saved by deferment of individual questions until these meetings.

The German method of teaching differs from the British. With the British method interest is sustained by the discussion of history, symptoms, and signs, and differential diagnosis, and by the liability of anyone suddenly to be asked a question. By the German method the diagnosis is often given first and followed by a discourse in which the grounds for the diagnosis are discussed. Much the same results are achieved in the end by the two techniques. For the courses the British method was used.

OPEN LECTURES

The last afternoon was usually occupied with a lecture or demonstration by either the consulting physician or surgeon, or a medical officer with special knowledge of some subject. These were open lectures which might be attended by anyone, including sometimes nurses from the clinic; as many as 150 have been present. The arrangement that has proved most satisfactory has been for the lecturer to speak slowly and clearly in English, and for each listener to have a German translation in front of him. Experience has shown that translation of German case-notes into English is best undertaken by an Englishman, but that the German version of a lecture to be given in English should be made by a German.

Medical officers attending the clinic have had the chance of seeing German methods and of obtaining clinical instruction in aspects of medicine which during their service they had had little opportunity of studying. The reading of textbooks, which has been increasingly practised since the end of the war, has been given added impetus by these courses, which have been greatly appreciated; and the German staff has worked hard to make them successful. Seven courses have been held at Gottingen, and they are being continued at Hamburg, which is more readily accessible. In addition, courses in midwifery are being held for nursing officers. It is intended that these courses shall be retained as a permanent feature of training in the B.A.O.R.

In England Now

A Running Commentary by Peripatetic Correspondents

DURING the war one had either to "stay put" or to keep moving round the world at an enormous pace. After nearly four years of the former, I spent the later part of the war in almost incessant travel. I gather that we itinerants were generally spoken of as "swans"—i.e., creatures who flit aimlessly from place to place sticking their long necks out. One's journeys ("really necessary" or otherwise) were often brightened by unexpected meetings with old friends. For instance, when I arrived at a general hospital in North Africa the first officer I met greeted me by my christian name—much to my surprise, for I certainly did not recognise the prosperous, mature individual who spoke. I discovered that we had been new boys at the same prep. school together, and that he had changed inwardly a good deal less than in outward appearance. And the O.C. of the same hospital turned out to be our own family physician, a territorial with whom I had lost touch since his call-up in 1939.

Then there are the people one is always meeting. One eminent medical major-general has done even more "swanning" than I have. Within a period of eighteen months our orbits have touched, quite without premeditation, at Prestwick airport (he en route for the U.S.A.; I on my way home from Africa), London, Manchester, Colombo, Melbourne, Delhi, and finally back in London again. I am convinced that if I ever reach the North Pole I shall find him squatting there. Then there are the others that one just misses. I have been trying to meet one scientist for years, and have been within a week of him in every continent of the globe.

It is often impossible to avoid the use of such clichés as "it's a small world." I remember meeting one American major at a laboratory in the heart of the Rockies. A month later we met again, this time at Myitkyina, on the Irrawaddy, in Burma, after he had crossed the Atlantic and I had crossed the Pacific.

* * *

Yes, as I was saying when you cut me off on Sept. 7, the practitioner in the Medically Overcrowded Area (M.O.A.) is perhaps less like a vulture than like that aged man a-sitting on a gate, of whom the poet sang:

> I shook him well from side to side
> Until his face was blue.
> "Come, tell me how you live," I cried,
> "And what it is you do."

True, neither a Royal Commission nor anyone else has, in so many words, asked him; but there can be no doubt of the shaking. It continues with increasing violence and perhaps can be taken to imply the question. Anyhow by the time the cyanosis has reached ante-mortem intensity it will be hard to give an articulate and dispassionate reply. That hour is not far distant. Better try now.

The essential feature of a M.O.A.—at least of mine—is that although it contains a fairly intimate mixture of citizens of every social and economic class a good number are what is called "educated"; some have comfortable incomes and some have inherited that sane and comely fashion of living which made Maurois call the English gentleman "la type la plus sympathique du monde." The combination of all this with the famous medical overcrowding has an almost wholly beneficent effect on the quality of medical practice. Comparatively speaking there is time for good work, rewards for doing it, and effective penalties for not doing it. Our all-round competence is, I am sure, less than that of many of our colleagues in country towns, to whom I take my hat right off; we are not their equals in resourcefulness, nor, I suspect, in power of endurance; they would beat us hands down at surgery, and I judge that they are better at team-work—your typical M.O.A. doctor works alone—but there are provinces of medicine in which I believe we hold the field.

It is fashionable to assert that the whole profession takes little or no interest in personal preventive medicine; it never sees the healthy patient and seldom even the early symptom; its concern is solely with declared disease. How different things will be when we have health centres! Perhaps they will, but in the meantime all these things which the whole profession neglects to do it does in fact daily, hourly, and as a matter of course in the M.O.A.

To set aside half or three-quarters of an hour for discussion of Susan's aversion to food and Willie's to sleep, for the terminal or annual overhaul of three children returning to school; to determine whether or why Mr. Smith has grown thinner, or why Miss Jones has been coughing for four weeks; to give Mr. Brown the once-over because he hasn't seen a doctor for several years—all the variations on these and kindred themes make up, except in seasons of epidemic, a large proportion of our daily work.

Now I am far from asserting that this is indeed the medicine of the future. For the practitioner it is exacting, difficult, rather tedious, full of pitfalls, and not very rewarding either in cash or in things discovered or things prevented. It can never be a main fountain of health, and for the patient it has potentialities for ill as for good. But it is the medical reformer's white-headed boy, it is perhaps the chief characteristic product of the M.O.A., and when the reformer has had his way with us the M.O.A. and all its works will be gone. Forsooth, a pretty paradox! But each man kills the thing he loves; and perhaps reformers are no exception.

What else do we do? The doctor's daily job, with perhaps six hours over in the week to divide between reading, writing, committees and societies, the family, and the cultivation of a garden or an art. Six? Well, perhaps eight, and, being on good terms with our professional neighbours, we get a yearly holiday without importing a locum. What really attracts us to the spot? Not fortune-hunting, but, this excluded, it is anyone's guess. My own is that if we were examined the greatest common factor in our make-up would be a certain slowness—we are not quick thinkers or quick workers; we must have time. Unquestionably we are individualists, with the qualities and defects of that species. Probably most of us set rather a high value on the pleasant manners and way of life to which most of us have been brought up and prefer a small income in a place where our wives and children can enjoy these things to a large one where they cannot. We may believe, too, that we can do our best work where we are; and we may be right.

What of our patients—the citizens of the M.O.A.? Are they privileged? I think they are; but not, as the planners preach and possibly believe, by receiving some costly drugs or magic treatments denied to others. They have, and exercise, free choice of the most genuine sort; they reap the very real benefits of competition. Each of us knows that if he lets his patient down that patient can turn to his neighbour. It is very salutary knowledge. They enjoy the almost priceless boon of being able to ask for an appointment to discuss any matter in which they think we can help them. To extend this last benefit to "insured persons" without much more encouragement than any government of the last 35 years has given must seem to most people impracticable. It seems so to me; but most men do not readily divide themselves, no-one can stop the diffusion of excellence, and there can be no doubt that all the citizens of the M.O.A. have some share in the refreshing fruits of medical overcrowding.

Nor, I think, can diffusion stop there. So long as there is somewhere a standard of excellence, there will be a tendency everywhere to attain it; destroy the standard and the tendency must cease.

Perhaps our manner of practice in the M.O.A. has no excellence, but if it has look your last on it, for it is scheduled for demolition. The shaking or "softening-up" by gently persistent public detraction and by alternate promises of sweets and smacks is well advanced. On the Appointed Day all our patients, I suppose, become "panel patients" and we can take our choice. We can try to maintain our standards under the familiar conditions of government contract practice with this egregious addition, that whereas it must clearly be both illegal and wrong to take fees from our own patients it will be legal and, in the eyes of authority, positively meritorious to see other men's patients behind their backs, give them an "independent opinion," and lift a fee for it. The whole foundation, in fact, economic and ethical, of our manner of practice will on that day be *bouleversé*.

But we have a choice. We can reject the sweets, accept the smacks, and take, bow in hand, to the merry green wood, outlawed for sabotage. A grim choice.

But think of the M.U.A.—the Medically Undercrowded Area. So I will; and I will think of their houses. I am shocked at the inequality of housing. Some live in mansions, some in hovels; but I have a plan. On an appointed day all who live in houses better or worse than an approved middle shall be housed in prefabs. Then, all their dwellings being alike demolished, the specially good brick, stone, timber, and tiles of the mansions can be used to fortify and increase the stock from which the approved middling houses in which all shall hereafter live are to be built. When all are in them, there being none better all will have the best.

What? You do not like my plan? You cannot bear that a house architecturally good and beautiful should be destroyed? You think it is part of our common inheritance, that it has value as a pattern? You don't think the bricks and stone of the mansions will go very far? You think they will be scarcely detectable? Sentimental dreamer! Hide-bound Tory! Enemy of the People! Upholder of privilege! Fascist reactionary! *Bourgeois!*

* * *

As I was doing a locum near, I went on pilgrimage to Selborne. I met the vicar, who told me a story of Gilbert White (see portrait), who was a small and precise man. When he was a subproctor at Oxford he found an undergraduate lying drunk and naked in the street and next morning he lectured him but did not punish him because even in his cups he had folded his clothes neatly by his side.

I touched the limes White planted to hide the carnage of the butcher's shop, I trod reverently on his grandfather's grave in the chancel of the village church, I admired the window—except its garish top—put up to his memory, mosaiced with many birds, and then went out to his own grave in the churchyard. It was pleasantly untended, hawkbit flowered on it and there were two thriving colonies of red ants. He would have liked that. I let them sting me, striving at a molecular continuity and kinship. May the peace that comes from the things of the earth, which he got and gave—and gives—be with him still.

* * *

I wonder how many people are making full use of the results of war-time research to increase their comfort when on holiday in Britain. Our biting insects and mites may not be the vectors of disease (and anyhow this year's weather has not encouraged cold-blooded creatures to breed) but many a holiday has been ruined by midges, gnats, or harvest-mites. D.M.P., or dimethyl phthalate, was well known to the troops in south-east Asia and elsewhere as an insect repellent, but how many have thought of it at home? And many who have had to go through the whole drill of smearing their clothes with D.B.P. in scrub-typhus areas have never thought of doing anything like that when they are attacked by harvest-mites. Yet one can protect oneself pretty thoroughly from these creatures by smearing a couple of c.cm. (or should we say ml.?) of either benzyl benzoate (any of the anti-scabies remedies containing it will do equally well), or of dibutyl phthalate on one's socks and perhaps round one's trouser bottoms. The remedy remains effective for several washes, so one application at the start of the harvest-mite season should do the trick.

HOSPITALS DAY.—This year hospitals day in London is to be Oct. 8. All who can help are asked to write at once to the appeal secretary of their local voluntary hospital, or to Lord Luke, chairman of Hospitals Day, 36, Kingsway, London, W.C.2.

Public Health

Typhoid at Aberystwyth

THERE are now further details of the outbreak of typhoid fever at Aberystwyth. Several people in the town were taken ill on July 22, 23, and 24, with headache, pyrexia, and cough; and on July 26 the first case of typhoid was identified. During the next few days the condition was diagnosed serologically in several further people whose history appeared to incriminate ice-cream sold by a particular vendor. A spot-chart kept at the Public-health Department indicated clearly that, apart from water, ice-cream sold by this man was the only foodstuff common to all patients admitted to hospita The milk-supply in the town is zoned; and the fact tha all the patients happened to belong to different zone was a great help in ruling out milk as the source o infection.

The county medical officer of health arranged for th isolation of all cases of typhoid, either in the loca hospital or in hospitals in South Wales, and an ambulanc service was organised. These arrangements worked smoothly.

The sale of ice-cream by the suspected vendor wa stopped on July 29; his blood gave a positive Wida reaction to *Bact. typhosum* (H) at a dilution of 1 in 320 and to (O) at 1 in 80; it also reacted to Vi at 1 in 80 Specimens of fæces grew no enteric organisms, bu *Bact. typhosum* was grown from the man's urine and wa later found to be of type C. He was admitted to an isolation hospital for further investigation and treatment By this time *Bact. typhosum* had been isolated from th other patients; they were all of type C.

Cases of typhoid have since been identified in th neighbouring district and elsewhere in the country in people who had lately been to Aberystwyth and partaken of ice-cream, many of them naming the particular seller. Altogether 76 cases have been notified in other areas.

The course of the outbreak is illustrated by the weekly notifications from Aberystwyth.

Week ending ..	July *27*	Aug. *3*	Aug. *10*	Aug. *17*	Aug. *24*	Aug. *31*	Sept. *7*
Cases notified ..	1	43	29	18	10	1	3

So far only one case has been reported with an onset more than 23 days after the sale of ice-cream by the carrier was stopped. This patient was a contact with his wife who had been ill for some days before calling in a doctor. Up to Sept. 8 only one other contact appears to have contracted the infection.

The diagnosis of cases and the tracking of carriers has been much facilitated by the presence of an Emergency *Public-Health Laboratory in the local hospital.* The immense value of such a laboratory in remote areas has been clearly demonstrated.

Infectious Disease in England and Wales

WEEK ENDED SEPT. 7

Notifications.—Smallpox, 0; scarlet fever, 668; whooping-cough, 1824; diphtheria, 284; paratyphoid, 42; typhoid, 21; measles (excluding rubella), 1321; pneumonia (primary or influenzal), 202; cerebrospinal fever, 33; poliomyelitis, 19; polio-encephalitis, 5; encephalitis lethargica, 0; dysentery, 86; puerperal pyrexia, 136; ophthalmia neonatorum, 74. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Sept. 4 was 843. During the previous week the following cases were admitted: scarlet fever, 42; diphtheria, 38; measles, 17; whooping-cough, 27.

Deaths.—In 126 great towns there were no deaths from measles or scarlet fever, 2 (0) from enteric fevers, 6 (0) from whooping-cough, 2 (0) from diphtheria, 31 (0) from diarrhœa and enteritis under two years, and 5 (2) from influenza. *The figures in parentheses are those for London itself.*

Bradford reported the 2 fatal cases of an enteric fever.

The number of stillbirths notified during the week was 236 (corresponding to a rate of 26 per thousand total births), including 34 in London.

Letters to the Editor

B.C.G.: THE NEXT PHASE

SIR,—Your timely leader of Sept. 14 raises a number of points of practical significance. As one who has recently visited the Scandinavian countries,[1] where I had a unique opportunity for seeing the work myself, I may perhaps make a few preliminary observations. I hope to publish my experiences more fully later.

I found the enthusiasm for B.C.G. in Norway, Sweden, and Denmark widespread, and most people were convinced of its efficacy as a valuable adjunct in the control of tuberculosis, although several public-health experts emphasised that vaccination should in no way interfere with established anti-tuberculosis measures. I was struck, too, with the little control work done on B.C.G. in any of the three countries, and, while I can understand and appreciate the difficulties encountered in this connexion, I hope that in this country we shall have an opportunity for remedying this defect in order to produce reliable statistical evidence of the value of immunisation. Such control work as I saw—admittedly the figures were comparatively small—was convincing; but I agree with your statement that "only the most carefully compiled figures in significant quantity will satisfy the statisticians."

Although we rightly look to chemotherapy for striking results in the future I think it is true that in this country a somewhat neglected field of preventive medicine has been protection against tuberculosis by active immunisation in tuberculin-negative subjects, more particularly among persons in areas of high tuberculosis morbidity and mortality—e.g., children of tuberculous families, students, nurses, and other young employees in general hospitals and sanatoria where exposure is great and protection difficult.

Taking into account the difference in the clinical features of tuberculosis in this country from those I noted in Scandinavia I felt that their work was highly encouraging. Few will question Heimbeck's original assertion—for which he deserves the highest credit—that tuberculin-negative nurses show a higher incidence of tuberculosis than those who are tuberculin-positive. I was privileged to see with him in Oslo a further extension of this work which more than corroborated his earlier observations.

Nothing that I saw impressed me more than the work of Prof. Arvid Wallgren, now professor of pædiatrics in Stockholm, who has certainly been the pioneer of B.C.G. vaccination in Sweden, having started his work in Gothenburg in 1926. His confidence in the clinical value of B.C.G. remains undaunted although he recognises its limitation and admits that it is not of use except in primary lung tuberculosis. Unfortunately even Wallgren has, however, had little opportunity for control work.

With regard to the respective merits of B.C.G. vaccine and the vole-bacillus vaccine of Wells, which you rightly suggest is running B.C.G. very close, Wallgren's observations to me are not without interest. He urged, from his own experience of vole vaccine, that it would be of the greatest scientific interest and value if we in this country were to use it. He gave me the impression that it would eventually supersede B.C.G. I think there is good evidence for the belief that both methods of inoculation (*a*) are harmless to humans, (*b*) increase resistance to tuberculosis, and (*c*) are of value only in tuberculin-negative subjects. B.C.G. has stood the test of time in many countries and its harmlessness has been established by its practical application on a large scale in many parts of the world. Nevertheless, there is good evidence that the vole-bacillus vaccine has the following advantages over B.C.G.: (*a*) it is apparently a more potent immunising agent; (*b*) its virulence is more stable (the varying virulence of B.C.G. in Norway, Denmark, and Sweden was noteworthy, and I was told on more than one occasion that some of the strains were losing their virulence); and (*c*) there is reason to believe that tuberculin allergy following vaccination with it was greater and occurred earlier than that following B.C.G.

Let me add a word about the method of administration of the vaccine. Wherever I went in the three countries the intracutaneous method devised by Wallgren was regarded as the quickest, most reliable, and practical; and it afforded a more accurate measure of the dosage. All observers were emphatic that complications such as significant abscesses never arose when the injection was truly an intradermal one but did arise when the technique was bad and some of the solution had been injected subcutaneously. I was given, especially in Denmark, an opportunity of assisting at the B.C.G. vaccine clinic and I can corroborate this view from what I saw. Such authorities as Herzberg in Oslo, Wallgren in Stockholm, Anderson in Gothenburg, and Winge in Copenhagen strongly favoured this method. The so-called transcutaneous method, either by scarification or multiple puncture with the Birkhaug-Rosenthal instrument, seemed to meet with little favour for a variety of reasons which space will not permit me to deal with here, and I had an excellent demonstration of it by a great authority.

From these impressions I think one is justified in urging that enthusiasm should be tempered with caution. Wisely handled there is little doubt that immunisation should prove a useful weapon. We have a unique opportunity for starting afresh with adequate control experiments and filling in the gaps which Continental and other workers, often through lack of opportunities and no fault of their own, have omitted. We must furnish sound statistical proof, beginning for preference with a selected group of the population who are exposed to unusual risks of tuberculous infection. May I, therefore, strongly support your plea that the Ministry of Health set up, as soon as practicable, an authoritative committee under the auspices of a body such as the Medical Research Council to institute a clinical trial of what they regard as the most effective method of tuberculosis vaccination?

London, W.1. PHILIP ELLMAN.

TREATMENT OF MENINGITIS

SIR,—Dr. Gaisford's letter of August 17 should serve as a useful corrective to over-enthusiasm. Whenever a new remedy is discovered for any particular malady, there seems to be a regrettable tendency to discard the older and often well-tried remedies. Recent examples of this appear to be syphilis and perhaps meningitis, particularly cerebrospinal fever. In the latter, it is surely a retrograde step to employ intrathecal therapy unnecessarily. What then are the indications?

Possibly the greatest triumph of the sulphonamides has been in the treatment of cerebrospinal fever, including acute and chronic meningococcal septicæmia, and the great majority of cases—95% according to Dr. Banks (Sept. 7)—respond excellently. With the exception of cases of sulphonamide intolerance and those rare cases of the ordinary types of the disease which fail to respond to sulphonamides, there is no real indication for the use of penicillin, at any rate intrathecally, in the non-fulminating varieties of cerebrospinal fever.

The fulminating varieties can be divided, perhaps a little arbitrarily, into those cases which are often dead within a few hours—Waterhouse-Friderichsen syndrome—and the type with well-marked meningitis which progresses to a fatal termination in about twenty-four hours. I have no experience of the use of penicillin in the former type of case, but its efficacy by whatever route it is administered (and it should certainly be given) would seem doubtful. In the second type of fulminating case, if after a few hours on combined sulphonamide and systemic penicillin therapy the patient's condition is still rapidly deteriorating, then, in accordance with the evidence so far available, intrathecal penicillin is indicated. I have not had cause to regret this, and two such injections are usually sufficient. It is important to remember, however, that such cases comprise a very small percentage of the total.

Similarly, penicillin is indicated in pneumococcal, streptococcal, and staphylococcal meningitis; and, in those cases which do not soon show improvement on systemic administration of the drug, the intrathecal route is again indicated. I have successfully employed this method in pneumococcal meningitis when, despite previous sulphonamide medication, the general condition continued to deteriorate. Obviously, as few intrathecal injections as possible should be given and one hopes that heroic procedures such as trephining the skull for the intraventricular injection of penicillin will not be embarked on indiscriminately.

---

[1] My visit was sponsored by the public-health committee of the county borough of East Ham, for whom I act as consulting physician for tuberculosis and diseases of the chest, and to whom I am greatly indebted.

It seems then that the indications for intrathecal penicillin are strictly limited and uncommon, and that the mere fact of the cerebrospinal fluid being opalescent or turbid or the cell-count increased are no indications for such therapy. The immediate risks are obvious—for example, the introduction of penicillin-resistant organisms—and the possibility of delayed sequelæ, such as *postmeningitic* headache, should not be forgotten. Clearly, much judgment and skill are required in deciding when this route of administration is advisable.

Royal Naval Auxiliary Hospital,
Barrow Gurney, Bristol.
J. L. FLUKER.

EFFECT OF PHOSPHATE ON CARBOHYDRATE ABSORPTION IN SPRUE

SIR,—Many will learn with regret, on reading his letter of Sept. 14, that Professor Maegraith has had to abandon his experimental work on sprue. I take this opportunity of making one comment. In both his letter and the preliminary communication referred to[1] he gives the impression that impaired phosphorylation as a factor in the pathogenesis of sprue was an idea emanating from himself, whereas the arguments supporting this belief were put forward by me four years ago,[2] though doubtless Professor Maegraith has overlooked the point.

London, W.1.
HUGH S. STANNUS.

CIRCULATION IN THE KIDNEY

SIR,—The preliminary communication by Trueta and his colleagues in your issue of August 17 (p. 237), and their demonstration of a diverted renal circulation following upon stimulation of afferent nerves, is at once interesting and important. The investigators are to be congratulated on their new technique, which has made their observations possible, as much as on the results so far described, and it is to be hoped that the histological investigations will be such as clearly to demonstrate, in the rabbit, the presence and character (or absence) of vasa recta and the other non-glomerular blood-channels which have been described.

It is indeed strange to read in your leading article (p. 239) that "the arrangement and functions of the vasa recta . . . have been relatively neglected," when, until this present claim of Trueta and his colleagues, it has been generally agreed that the work of Huber (1906–07), Gérard (1911), Traut (1923), and MacCallum (1926) had disproved such non-glomerular medullary supply described by Ludwig (1852), Virchow (1857), and Golubew (1893)—just as the röntgenographic studies of Katzenstein (1911), Liek (1915), and Gross (1917) had disproved the existence of large arteries arching over the pyramids, the arcuate arteries of von Ebner (1899).

In 1889 Bradford demonstrated vasoconstriction within the kidney, and resulting shrinkage, on stimulation of the splanchnic nerves, and similar reflex contraction by central stimulation of the cut sciatic nerve and vagus, and confirmed the earlier observations on the relation of the splanchnics to the output of urine by Claude Bernard (1859), and Cohnheim and Roy (1883). Burton-Opitz and Lucas (1908) showed that section of the splanchnics increases the blood-flow through the kidneys, whereas stimulation decreases the flow; and Burton-Opitz (1908) showed that the right and left splanchnics were distributed to the right and left kidneys respectively. In the frog, Bieter (1930), confirming the work of Richards and Schmidt (1924–25) and Richards (1925), recorded that stimulation of the sympathetic fibres to the kidney, and of the central end of a cut sensory nerve, such as the sciatic, produced great vasoconstriction throughout the kidney: the majority of active glomeruli stopped, showed stasis and gradual emptying of the capillaries but no inflow of red cells, while "The glomeruli which do not stop as a result of splanchnic stimulation sometimes appear to show a flow at an increased speed, as if a certain amount of arterial blood must get into the kidney regardless of the number of glomeruli that are open for flow." Andrews (1927) noted anuria in dogs following the release of tight ligatures from the leg, and Bieter repeating this in the frog noted reduced glomerular capillary activity, an effect which was removed by section of the splanchnics. Bieter (1935) observed that "it is likely that in the frog the vasomotor control of the kidney vessels is not as highly developed as it is in mammals and man, and consequently, ascending the scale, the effects would possibly be more powerful."

When it is recalled that in human cases of severe renal cortical necrosis, in which even the columns of Bertini are involved, the medulla is not necrotic and a great many of the deep (juxtamedullary) glomeruli show no stasis, that they and their wide efferents (which pass to the medulla direct) are in fact functioning, it is not unnatural to conclude that this reduced or diverted (medullary) circulation may well be maintained by these glomerular efferents—without requiring the existence of vasa recta or of the corticomedullary arteriovenous shunts described by Steinach (1884) and Spanner (1938) to explain the viability of the pyramids and the anuria.

Like circumstances obtain in the rabbit in experimental renal cortical necrosis. In the normal rabbit kidney 5–7 % of the contained blood is present in the glomerular capillaries where it is changed about 5 times per second and has a probable velocity of 1–2 mm. per second. Thus if 85 % of the glomeruli are involved in the necrotic process of renal cortical necrosis, the remaining 15 % (large juxtamedullary glomeruli) can accommodate the whole normal glomerular capillary volume, simply by all of their capillary loops coming into play, should the minute-volume remain unaltered (personal observations on glomerular circulation). The circuit-time in this "medulla-diverted" circulation will be reduced too, for the deep glomeruli and their efferents are largest and egress is free, resulting medullary blood-channels are short and wide vis-à-vis the cortical capillary rete. In other words, from a consideration of the hæmodynamics of the renal circulation in the rabbit, it is possible to suggest that the degree and character of the altered renal circulation, as outlined by Dr. Trueta and his colleagues, and the "redistribution of blood-flow within the kidney" discussed by Professor Maegraith (p. 213), could be maintained by a circulation via the deep (subcortical or juxtamedullary) glomeruli only, the cortex being relatively avascular, by vasoconstriction of the peripheral arterial vessels in response to afferent (sciatic or other) stimuli.

But vasa recta and their loops are described, and we await with interest the first clear demonstration of these vessels (in situ), and possibly also of other non-glomerular supplies and shunts which from time to time have been described.

REFERENCES

Andrews, E. (1927) *Arch. intern. Med.* 40, 548.
Bernard, C. (1859) in Schmidt's Jahrbücher, vol. CIV, p 4 (quoted by Bieter).
Bieter, R. N. (1930) *Amer. J. Phys.* 91, 436.
— (1935) in Berglund and Medes's Kidney in Health and Disease, Philadelphia, p. 126.
Bradford, J. R. (1889) *J. Physiol.* 10, 358.
Burton-Opitz, R. (1908) *Pflüg. Arch. ges. Physiol.* 125, 221.
— Lucas, D. R. (1908) *Ibid.* 123, 553.
Cohnheim, J., Roy, C. S. (1883) *Virchows Arch.* 92, 424.
Gérard, M. (1911) *J. Anat., Paris*, 47, 169.
Golubew, W. Z. (1893) *Int. Mschr. Anat. Physiol.* 10, 541.
Gross, L. (1917) *J. med. Res.* 36, 327.
Huber, G. C. (1906–07) *Amer. J. Anat.* 6, 391.
Katzenstein, M. (1911) *Berl. klin. Wschr.* 2, 1651 (quoted by Gross).
Liek, E. (1915) *Arch. klin. Chir.* 106, 3 (quoted by Gross).
Ludwig, C. (1852) Lehrbuch der Physiologie des Menschen, Leipzig and Heidelberg, vol. II, p. 255.
MacCallum, D. B. (1926) *Amer. J. Anat.* 38, 153.
Richards, A. N. (1925) *J. Urol.* 13, 283.
— Schmidt, C. F. (1924–25) *Amer. J. Physiol.* 71, 178.
Spanner, R. (1938) *Verh. anat. Ges. Jena*, 45, 81.
Steinach, E. (1884) *S.B. Akad. Wiss. Wien.* Math.-Naturw. Cl. 90, 171 (quoted by Shonyo, E. S., Mann, F. C. *Arch. Path.* 1944, 38, 287).
Traut, H. F. (1923) Carnegie Inst. Washington Publ. no. 332, vol. XV p. 103. Contribn Embryol. no. 76.
Virchow, R. (1857) *Virchows Arch.* 12, 310.
von Ebner, V. (1899) in Kölliker's Handbuch der Gewebelehre des Menschens, vol. III, part 1, *Leipzig.*

J. F. HEGGIE.

Department of Pathology, The University, Glasgow.

---

[1] *Lancet*, 1945, ii, 635.
[2] *Trans. R. Soc. trop. Med. Hyg.* 1942, 36, 124.

MYTH AND MUMPSIMUS

SIR,—Many of us must be grateful to Dr. Forbes for his destructive article in your issue of August 31. I have often thought that destructive thought is a valuable property. The vast accumulations of rubbish, many of them monuments to the more foolish moments of great men, need a great deal of shaking; and I do not think Dr. Forbes has gone nearly far enough.

He writes that there is only one criterion for the value of any therapeutic procedure—does it work with patients? Many theoretically sound treatments fail because they work only if the patient is isolated in an artificial environment. Take the magic bullets of Ehrlich and their later modifications. In actual practice this treatment sometimes failed, perhaps by the accidents of treatment but often by default or irregular attendance for the long and tedious courses of injections. Because of these limitations the magic looked shabby in the light of day. The failure in many cases was due to the fact that a man was primarily a lorry driver, a hotel clerk, or a commercial traveller—in other words, a human being—and only secondarily a patient with syphilis.

Any treatment that fails to recognise the human nimal as a whole and its place as a social unit tends to artial success. The immobilisation of young children or long periods seems a sorry sort of treatment for a ving creature; it fails in that it treats a part by maltreating the whole. Activity is an essential part of health, and far more care should be taken not to prescribe unnecessarily restrictive measures; nor should a man be taken off work without the most careful consideration. He often does better if he stays at work.

The same applies to diets. A man should enjoy his food because enjoyment is an essential part of good digestion. Very few diets are enjoyable. Is it not a fact that what we are really enduring in our ordinary dietary is not lack of calories but unmitigated English cooking? Why does the gastric-ulcer patient have his meat minced? A more horrid food than minced meat cannot be imagined, and given a reasonable set of teeth the natural act of chewing suffices; chewing, moreover, promotes digestion.

The trouble in gastric-ulcer diets is partly due to simple-minded arguing from pathology. Here, we say, is an ulcer in the stomach, it must not be irritated by pips, fruit skins, stalks, meat extracts, alcohol, or tobacco. But patients are often willing to experiment and some find beer, as well as other supposed irritants, gives them no discomfort. Many manage a practically normal diet except for greasy foods. Arguing from pathology, well-lubricated greasy foods should slide harmlessly over an ulcer. They apparently do not. Nevertheless, pathology is a valuable corrective in medicine. Unfettered by it Freud trampled on the fairy stories of Greece and raised some extraordinary myths. Worse still, the psychoanalytical school is becoming respectable—it even appears in the Brains Trust!

It seems a pity to blow up some of these picturesque ruins, but it may be necessary; besides it gives healthful pleasure to those who cannot stand bunk, especially when buttressed by authority.

Oxford. G. WHITWELL.

CALF SERUM FOR TRANSFUSION

SIR,—No doubt war-time conditions prevented Dr. Massons, of Barcelona, having access to my paper on despeciated bovine serum (*Brit. med. J.* 1944, i, 73) to which you refer in your annotation. A material somewhat similar to P.C.P. was produced in the department of surgery, University of Liverpool, by the addition of formalin and ammonia to bovine serum. The essential difference in the final production of the solution is, however, that in despeciated bovine serum the heating process is taken to 72° C only, while in P.C.P. the solution is heated to 100° C. Experiments which we did showed that the agglutinins are destroyed at 72° C, associated with changes in the globulin fraction. At this temperature the changes in the albumin fraction are small and the material still exerts an osmotic pressure of 120–160 mm. of water compared to the figure of 150 mm. of water found for pooled citrated plasma. Material heated above this temperature shows a steady decrease in the osmotic pressure until at 100° C it has none at all. The readings were taken by the micro-method of Krogh and Nakazawa against mammalian Ringer solution. It is thus difficult to see how P.C.P. can have any more beneficial effect than normal saline.

The original reason for the preparation of despeciated bovine serum was to produce a substitute for human plasma that would have been of value had the supplies of human plasma not been sufficient to meet war-time needs. When it was apparent that human material was available in sufficient quantities, further production of despeciated bovine serum was stopped. It was administered safely, however, to over 200 patients by myself and others in amounts of one pint or more, the largest volume given to one patient being 16 pints. I would reaffirm that despeciated bovine serum prepared by the Liverpool method is non-toxic, non-antigenic, free from antibodies, of an equivalent osmotic pressure to citrated human plasma, retained in the circulation, and eventually metabolised.

Liverpool. F. RONALD EDWARDS.

LATENT PERIOD IN KALA-AZAR

SIR,—The following case well illustrates the fact, pointed out by Armstrong,[1] that there may be a long latent period before kala-azar produces symptoms. This seems to be fairly well known, but is nowhere else emphasised in the published work. Manson-Bahr[2] suggests six months as the upper limit of the incubation period, and Strong[3] and Scovel[4] suggest four months as the maximum; but none of these authors draws attention to the further latent period which may occur before symptoms appear. Manson-Bahr notes that the disease may remain latent for many months in artificially infected dogs, and Sweeney et al.[5] describe a case with a "presumptive latent period of two years," as in the present case.

A private, aged 26, served from April, 1940, to December, 1943, in Eritrea, Egypt, Libya, Palestine, and Syria, and from December, 1943, to February, 1944, in Italy. His disease probably originated before December, 1943, after which date he was stationed north of Naples.

In the summer of 1945 he noted that his belt seemed tight on exercise, but otherwise he felt perfectly fit. In October, 1945, he was admitted to hospital with a history of coryza for about a month, and of headache, shivering, and sweating for several days.

He was thin and pale, with a yellowish tinge to the skin, and had a swinging temperature rising to 100°–103° F every evening, accompanied by profuse sweats. A large tumour was present in the left hypochondrium extending to below the level of the umbilicus. The nature of this tumour remained in doubt, it being considered to be either the spleen or the left kidney. An intravenous pyelogram did not help, because no dye was excreted on the left side; and an attempt at ascending pyelography was unsuccessful. The liver was not palpable, and no enlarged glands were felt.

Blood-count: red cells 2,030,000 per c.mm., Hb 48% (14·5 g. per 100 c.cm.), colour-index 1·1; white cells 2650 per c.mm. (polymorphs 50%, lymphocytes 25%, monocytes 10%, eosinophils 1%, myelocytes 3%, myeloblasts 3%, unclassified 2%). Plasma protein 7·55 g. per 100 c.cm.

Sternal puncture gave a marrow count of polymorphs 8%, myelocytes 40%, metamyelocytes 3%, lymphocytes 0, monocytes 0, normoblasts 6%, premyelocytes 6%, myeloblasts 4%, erythroblasts 33%, megaloblasts 0. No Leishman-Donovan bodies were seen.

Other investigations all proved negative, and further blood-counts and sternal punctures showed a similar picture, Leishman-Donovan bodies still being absent from marrow smears. Patient's condition altered little, and the high evening temperature and profuse sweats continued.

In view of the continued doubt in diagnosis, laparotomy was done on Nov. 23, after transfusion with packed cells. The tumour was found to be a grossly enlarged spleen. No other abnormality was found in the abdomen. Splenic puncture

---

1. Armstrong, T. G. *Brit. med. J.* 1945, ii, 918.
2. Manson-Bahr, P. H. Manson's Tropical Diseases, London, 1945, p. 156.
3. Strong, R. P. Stitt's Diagnosis, Prevention, and Treatment of Tropical Diseases, Philadelphia, 1944.
4. Scovel, F. G. *Ann intern. Med.* 1944, 21, 607.
5. Sweeney, J. S., Friedlander, R. D., Queen, F. B. *J. Amer. med. Ass.* 1945, 128, 1020.

was done, but no Leishman-Donovan bodies were found either on direct examination of the biopsy specimen or on culture.

On Dec. 18, as there was no improvement, it was decided to treat the case as kala-azar, and a course of stilbamidine 0·075 g. followed by 0·15 g. daily to a total dosage of 2·25 g. was given. The sweating began to decrease after six or seven days, but the temperature did not respond till the thirteenth day of the course, when it dropped suddenly and thereafter remained low.

On Dec. 25 culture of marrow blood in Lache-dextrose sloppy agar with defibrinated rabbit blood at 24° C grew "distinct leptomonas forms of Leishman-Donovan bodies, fresh preparations showing characteristic motility."

Progress was slow but excellent, the anæmia improving and the spleen decreasing in size. In February, 1946, patient was given a course of urea stilbamidine. In March his general condition was most satisfactory, the spleen being just palpable and the anæmia clearing well. In April, 1946, he reported numbness of forehead, cheeks, and lips, but was otherwise well.

The chief points of interest in this case are the long latent period, the difficulty in diagnosis, and the dangers of Vth nerve involvement when stilbamidine is used.

A. P. NORMAN.

Hospital for Sick Children, Great Ormond Street, London.

⁂ L. E. Napier, writing in the *British Encyclopædia of Medical Practice* (London, 1938, vol. VII, p. 342), mentions a patient who developed symptoms of kala-azar after being away from any endemic area for 18 months.—ED. L.

CHILDREN WHO SPEND TOO LONG IN BED

SIR,—Dr. McCluskie, in his letter of Sept. 14, replying to my criticisms of his article, has so far retracted as to say that the time of sleep required by a child may vary by "an hour, or more, or less": this period of an hour was not mentioned in the original article. He reaffirms his statement, with which no-one will disagree, that many children spend too long in bed: but he does not explain how the mother with two or more small children, and little or no domestic help, can follow the "detailed directions" which he thinks necessary for sleeping as well as feeding.

He has also failed to produce any evidence for the dogmatic statements in his article that "if a baby has an hour too much sleep during the day it will certainly cry during the night," and "variation by even 15–30 minutes from the amount of sleep each particular child requires at each month produces violent change of behaviour." If "years of experience with children" lead him to these conclusions, I can only assume that his experience has been limited to dealing with rather unusual children. A perceptive mother recognises that external factors such as the activities of the day, physical and mental, produce variations in the amount of sleep required: and I think it a facile assumption that the behaviour disorders which Dr. McCluskie describes can be so directly related to lack or excess of sleep. In his *Contributions to Analytical Psychology* Jung says that "the neuroses of children are rather symptoms of the parents' mental condition than a genuine disease of the child."

I should be glad to know the signs and symptoms of "a nation-strangling matriarchy."

London, W 11. CATHERINE STORR.

SIR,—Dr. McCluskie gives good advice concerning hours of sleep for children. One cannot make a child sleep to suit one's convenience. I suggest that, if he wakens early, the child might be encouraged to play quietly with some toys, after being made comfortable, until his mother is ready to dress him and give him his breakfast. I consider that an average baby of a few months requires more sleep than Dr. McCluskie prescribes. A baby wakened too long before his feed will get tired and fretful. A contented baby soon learns to adjust his own sleeping hours to his individual needs. He will lie playing with his hands, and later practising making new noises, and a busy mother will be unaware when he wakened or fell asleep again. He should be as happy in his pram as anywhere, though he will enjoy a regular kicking time to exercise his limbs: this time can be increased in length to correspond with his abilities.

Eastbourne. JOAN BRIGDEN.

EPIDEMIC THROMBOPHLEBITIS

SIR,—There seems little doubt that the condit described by Lieut.-Colonel Manson-Bahr and Dr. Charters (Sept. 7, p. 333) is the tropical primary phlebiti described in 1941 by one of us[1] as occurring in Norther Rhodesia. Since then this disease has been st further, and our observations on 71 cases will sh be ready for publication. Manson-Bahr and Charte state that they find no histological cause for the thrombosis. The histological appearances in the vein wa described in 1941 were acknowledged then as obviousl abnormal (A. C. L.) but the interpretation of these an of a subsequently observed chronic case with giant cel (cf. Manson-Bahr's case, p. 334) was at last made clea by a recent opportunity to study what is certainly th essential lesion. It had come to be appreciated (A. C. F. that only a short stretch of the vein was primaril involved, and microscopy of this zone has now reveale a peculiar form of inflammation characterised by extrem proliferation of young capillaries in the disrupted medi of the vein, and by the presence of phloxinophil intracytoplasmic inclusions.

Luanshya, Northern Rhodesia,
and Department of Pathology,
University of Glasgow.

A. C. FISHER.
A. C. LENDRUM.

ROYAL COLLEGE OF PHYSICIANS OF LONDO

SIR,—A letter in the *British Medical Journal* o August 31 (p. 313) has focused attention once more o the statutes, by-laws, and regulations of the Roya College of Physicians and the justifiable discontent which they arouse.

As is well known, the present regulations do not allow members to take any part in the running of the college. In fact, they are specifically debarred from doing so under by-law 118, which says ". . . they shall not be entitled to any share in the Government, or to attend or vote at General Meetings of the Corporation." Surely this state of affairs is quite out of date, and in view of the great changes now taking place the time is ripe for the college to broaden its representation with a view to ensuring that members obtain a voice in its counsels and deliberations on common-sense, democratic lines.

The college, instead of remaining a mere academic institution, should become a living force, capable of exercising a profound influence for good on various medical, social, and educational problems confronting us and pressing urgently for solution.

The first step in this desirable aim must surely be the provision of facilities for adequate representation by the members, who should be given every encouragement to form their own standing committee, &c., and take an active part in the management of the college. Obviously one of the important tasks of any newly elected committee should be to go into the question of the revision of the existing regulations concerning the election of fellows.

C. ANDERSON.
M. N. PAI.
D. SHAW.

Sutton Emergency Hospital.

EFFICACY OF THE PENICILLINS

SIR,—Your leading article of Sept. 14 directs attention to the desirability of ensuring that penicillin used [illegible] medicine shall, as far as practicable, consist only [illegible] penicillin II (G). For some time past we have been fully conscious of this, and, by the choice of appropriate media and precursors, together with the use of selective extraction procedures, we have secured approximately 90% of penicillin II (G) in our product. As a further precaution, our vials are now filled so that, within the limits imposed by existing assay procedures, we believe them to contain the stated content of penicillin II (G) —i.e., if a vial is claimed to contain 100,000 units of penicillin, it contains not less than that number of units of penicillin II (G), and any small proportion of penicillin IV (K) which may be present is additional. In this manner the practitioner is assured of the full dosage of the penicillin on which he relies for therapeutic efficacy.

H. JEPHCOTT
Managing Director,
Glaxo Laboratories Ltd.

Greenford, Middlesex.

---

[1] Fisher, A. C. *S. Afr. med. J.* 1941, 15, 131.

Notes and News

CRICHTON ROYAL FELLOWSHIPS

TODAY some inside knowledge of the working of a modern psychiatric hospital is essential for the consultant, and many established specialists have been spending a busman's holiday visiting their colleagues at the Crichton Royal, Dumfries. To fill this gap and to hasten the fuller training in psychiatry lately recommended by the Royal College of Physicians, the board of directors of the Crichton Royal have set up three fellowships, in addition to the ordinary staff of the hospital. The fellows will receive training in all branches of clinical psychiatry, including fever treatment, prolonged narcosis, electric convulsion therapy, insulin therapy, and leucotomy. They will have opportunities to work in the outpatient and child-guidance clinics, to join in the work of the psychiatric social worker, and take part in home and follow-up visits. Each fellow will be attached to one of the senior psychiatrists who will be responsible for his instruction, and later patients will be allotted to him. He will also attend all clinical staff meetings and become familiar with the management of different wards, the legal problems of psychiatry, and routine psychological testing. The fellowships, which carry a salary of £400 a year in addition to residential emoluments, will in the first instance be tenable for one year from Feb. 1, 1947. Forms of application may be obtained from the physician superintendent of the hospital and should be returned not later than Dec. 16.

ART FOR THE ILL

Adrian Hill, an artist, had tuberculosis, and during his long boring convalescence found how quickly he could make the hands of the clock move by sketching in pencil or water-colour. When he got up he shared this device for passing the time with his fellow patients, and, partly no doubt owing to his own ability to instruct and interest, found many who could equal his pleasure in making pictures, if not his technical skill. He has written a likeable book (*Art versus Illness*, George Allen and Unwin, 10*s.* 6*d.*) about this small start in a new type of occupational therapy and its considerable developments. He found a starved taste for pictures in many unlikely quarters, and in others a bent for original work which needed only opportunity to grow. His experiment seems likely to become an accepted part of treatment in some sanatoria and should be seriously considered in all. His amusing and constructive little book, illustrated with many of his own drawings and those of his patient-pupils, is well worth reading with this idea in mind.

DELINQUENCY ON THE SCREEN

THE approved schools usually carry on their constructive work without much publicity, but their achievements are so notable that they should be widely understood. *Children on Trial*, a Crown Film Production now showing at the Academy Cinema, furthers this end and also adds to the high reputation of British documentaries. The stories of three delinquent young people are outlined without any emotional emphasis, and the result is not only moving but intensely interesting—far more so, indeed, than the average thriller. The delinquencies are not understated, the extenuating circumstances kept in perspective, the approved school with its scope for growth of mind, body, and spirit presented fairly. The cast includes only two professional actors, one of whom plays the delinquent girl, the other the headmaster of the approved school. The other actors are taking their natural parts, the boys being played by Liverpool and Birmingham schoolboys. The boy playing the main delinquent has a natural economy of expression and gesture which could not be bettered. Doctors should try to see this informative film.

Family Planning Association

The association is holding a conference on Infertility, on Sept. 21 and 22, at the National Institute for Medical Research, Hampstead, N.W.3. At 3 P.M. on Saturday, the 21st, Dr. Mary Barton will speak on the Biology of the Cervix, and Dr. G. I. M. Swyer on the Rôle of Hyaluronidase in Fertilisation. There will be demonstrations at 5 P.M., and afterwards Dr. Audrey Smith and Mr. A. S. Parkes, F.R.S., will read a paper on Antigenic Properties of Spermatozoa. On Sunday, the 22nd, at 11 A.M., Dr. Margaret Hadley Jackson and Mrs. C. Harvey will speak on Experience with A.I.H., Dr. Muriel Rose on the Prognostic Value of Semen Examination, and Dr. Raymond Cross on Habitual Abortion. Further particulars may be had from the secretary, 69, Eccleston Square, London, S.W.1.

University of Edinburgh

Mr. D. M. Douglas has been appointed lecturer in experimental surgery in the university, and deputy director of the Wilkie Surgical Research Laboratory. He has also been elected to the staff of the Royal Infirmary as an associate assistant surgeon.

University of Glasgow

Dr. Thomas Anderson, physician superintendent of Knightswood Hospital, Glasgow, has been appointed full-time lecturer in infectious diseases in the university. The lectureship which the university has set up after consultation with the city corporation is the first full-time one in this country and carries with it the title of visiting physician to Knightswood Hospital, so that the holder may have adequate clinical material for teaching and research. Dr. Anderson will also become consultant in infectious diseases to the corporation. The salary scale of the lectureship is to be £1200–£50–£1500.

Dr. Anderson, who graduated M.B. at the University of Glasgow in 1928, held a resident appointment at the Western Infirmary and later became deputy physician superintendent at Ruchill Fever Hospital. He was elected F.R.C.P.E. in 1940, and obtained his M.D. with honours last year. His published work includes papers on the use of chemotherapeutics in infectious diseases, particularly pneumonia.

Royal College of Obstetricians and Gynæcologists

On Sept. 27 the honorary fellowship of the college will be conferred on Mr. Victor Bonney in recognition of his services to British gynæcology.

Travelling Fellowships

The Medical Research Council have awarded Rockefeller medical fellowships for 1946–47 to the following:

SHEILA T. E. CALLENDER, M.D. St. And., M.R.C.P., graduate assistant, Nuffield Department of Clinical Medicine, Oxford.

C. E. DENT, M.B. Lond., M.R.C.P., research assistant, medical unit, University College Hospital, London.

A. M. JONES, M.B. Manc., M.R.C.P., Leverhulme research scholar (Royal College of Physicians), University and Royal Infirmary, Manchester.

A. M. MACDONALD, M.D. Edin., F.R.C.P.E., department of pathology, Edinburgh University.

J. E. MORISON, M.D. Belf., lecturer in morbid anatomy, Queen's University, Belfast.

F. T. C. PRUNTY, M.D. Camb., M.R.C.P., lecturer in chemical pathology, St. Thomas's Hospital medical school, London.

F. F. RUNDLE, M.D. Sydney, F.R.C.S., surgical specialist, R.A.M.C., lately chief assistant and registrar, Westminster Hospital, London.

JOHN SWINNEY, M.C., M.D., M.S. Durh., assistant surgeon, department of urological surgery, Newcastle-on-Tyne General Hospital.

The council have also awarded a Dorothy Temple Cross research fellowship in tuberculosis to:

T. F. JARMAN, M.D. Durh., assistant tuberculosis physician, Welsh National Memorial Association.

International Society of Medical Hydrology

This society is holding its first post-war meeting at Buxton from Oct. 4 *to* 6. The speakers will include Dr. J. van Breemen (Four Causal Factors of Rheumatic Disease in Connexion with Medical Hydrology), Mr. R. Whittington (Plasma Viscosity), Dr. Victor Ott (Present Swiss Concepts of Rheumatism and Physical Medicine), Dr. Abraham Cohen (Physostigmine in Rheumatoid Arthritis), and Dr. Louis T. Swaim (American Concepts on Arthritis). Further particulars may be had from Dr. Donald Wilson, 28, The Circus, Bath.

Service Prizes

The R.A.M.C. Prize Funds Committee announce that the following prizes are open for award in 1947 after a lapse of some eight years due to the war:

Leishman Memorial Prize.—A silver medal and £30 for the best work in any branch of medicine, surgery, or the allied sciences, or in connexion with the general duties of the R.A.M.C. or of the Army Dental Corps.

Alexander Memorial Prize.—A silver medal and £70 to the officer who during the year has done most to promote the study and improvement of military medicine, surgery, hygiene, or pathology.

Parkes Memorial Prize.—A silver-gilt medal and £60 to the regular serving medical officer who has done most to promote the study of naval or military hygiene.

The Alexander and Parkes prizes are not open to officers on the staffs of the Royal Naval Medical School, the Royal Army Medical College, or the Army School of Hygiene. In making these two awards first consideration will be given to original articles published in a medical journal, and part authorship will not justify the recommendation of an officer for these prizes.

Recommendations should be sent through the usual channels, with copies of original articles and reports, to reach the hon. secretary of the committee, R.A.M. College, Millbank, London, S.W.1, by Dec. 31.

Middlesex Hospital

The annual dinner will be held at the Savoy Hotel, London, W.C.2, on Friday, Oct. 4, at 7.30 P.M.

Nutrition Society

The society is holding a conference on The Work and Aims of the Food and Agriculture Organisation on Saturday, Sept. 21, at 10.30 A.M., at the London School of Hygiene, Keppel Street, London, W.C.1. The speakers will include Sir John Orr, F.R.S., *director-general of F.A.O.*; Mr. D. Lubbock; Dr. P. Lamartine Yates; Dr. W. R. Aykroyd; and Miss E. Fautz.

Medical Society of the L.C.C.

There will be a clinical meeting of the society on Thursday, Oct. 3, at 3 P.M., at Dulwich Hospital, S.E.22, when the staffs of Dulwich and St. Olave's Hospitals will demonstrate cases.

Association of Industrial Medical Officers

The annual general meeting of the association will be held at the London School of Hygiene, Keppel Street, W.C.1, on Friday, Oct. 18th, at 5 P.M., and will be followed by a dinner at 7.30 P.M. On Saturday, the 19th, at 10.30 A.M., Dr. Donald Hunter and Dr. R. S. F. Schilling will speak on Industrial Medicine in the U.S.A.

St. Thomas's Hospital

Dr. A. L. Crockford has been appointed secretary of the medical school in succession to Dr. R. J. C. Thompson, who has resigned.

Brazilian Honour

The Brazilian order of the Southern Cross has been conferred on Sir Alexander Fleming, F.R.S., who presided over the Inter-American medical congress which met in Rio de Janeiro this month.

Return to Practice

The Central Medical War Committee announces that Dr. Kenneth O. Black, 27, Weymouth Street, W.1 (Langham 3336), has resumed civilian practice.

Births, Marriages, and Deaths

BIRTHS

DUTTON.—On Sept. 10, in Manchester, the wife of Captain G. C. D. Dutton, R.A.M.C.—a daughter.

HACKETT.—On Sept. 8, the wife of Dr. C. J. Hackett, of Wendover, Bucks—a son.

HIBBERT.—*On Sept. 13, in Liverpool, the wife of Dr. Geoffroy Hibbert—a son.*

HUSTON.—On Sept. 7, the wife of Lieut.-Colonel John Huston, *R.A.M.C., of Edinburgh—a daughter.*

LILLICRAP.—On Sept. 12, at Lincoln, the wife of Dr. Charles Lillicrap—a son.

LOGIE.—On Sept. 9, at Aberdeen, the wife of Mr. Norman Logie, F.R.C.S.—a son.

MARRIOTT.—On Sept. 11, in London, the wife of Dr. Ian Marriott—a son.

MAY.—On Sept. 8, at Chatham, the wife of Surgeon Lieut.-Commander R. T. May, R.N.—a son.

PORTER.—On Sept. 6, at Woking, the wife of Dr. H. L. Porter—a son.

SMITH.—On Sept. 7, in London, the wife of Dr. J. F. Smith—a son.

VICARY.—On Sept. 12, Dr. Patricia Vicary (née Shaw), the wife of Dr. Peter Vicary, of London, W.14—a son.

WYNNE.—On Sept. 7, the wife of Dr. Roger Wynne, of Banbury—a daughter.

YUDKIN.—On Sept. 7, the wife of Dr. Simon Yudkin—a daughter.

MARRIAGES

AMBROSE—CLAVERING.—On Sept. 11, in London, Gordon Ambrose, L.M.S.S.A., to Sheila Clavering.

BENNETT—MELLING.—On Sept. 7, at Baylham, Harold Stanley Bennett, M.B., R.A.F.V.R., *to Barbara Hunter Melling.*

REID—SHARPE.—On August 31, in Calcutta, Grainger Wilson Reid, lieut-colonel R.A.M.C., to Ruth Hilda Sharpe, Q.A.I.M.N.S./R.

WALKER—JONES.—On June 14, in Nairobi, D. O. Walker, major R.A.M.C., to Mary Jones, Q.A.I.M.N.S./R.

DEATHS

BEEVOR.—On Sept. 15, at Burnham, Bucks, Charles Ferrier Beevor, M.A., B.M. Oxfd.

GOLDEN.—On Sept. 8, at Ilford, Michael Bruce Howard Golden, M.R.C.S.

GRAY.—On Sept. 12, at Dalkeith, Midlothian, George Douglas Gray, C.B.E., M.D. Edin., late lieut.-colonel R.A.M.C.

HILL.—On Sept. 8, at St. Mary Bourne, Hampshire, Alfred Arthur Hill, M.D. Durh.

HOWIE.—On Sept. 7, Mary Evelyn *Howie,* M.B. *Durh., of Gosforth,* Newcastle-on-Tyne.

PATON.—On Sept. 9, at St. Albans, Herts, Richard Reid Kirkwood Paton, M.B. Glasg., D.P.H.

SLAYTER.—On August 22, in Madras, Edward Wheeler Slayter, C.M.G., D.S.O., M.B. Edin., late colonel R.A.M.C., retd., of Halifax, Nova Scotia.

STREET.—On Sept. 8, at Crowborough, Ashton Street, M.B. Camb., F.R.C.S., lieut.-colonel I.M.S., aged 82.

WILSON.—On Sept. 10, in Cardiff, James William Albert Wilson, M.D. Belf.

Medical Diary

SEPT. 22 TO 28

Monday, 23rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. R. A. Willis: Experimental Production of Tumours.
5 P.M. Dr. N. F. Maclagan: Basal Metabolism.

Tuesday, 24th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Statistical Study of Tumours.
5 P.M. Dr. L. E. Glynn: Nutritional Factors, Hepatotoxic Agents, and Liver Function.
MEDICAL WOMEN'S FEDERATION
8.30 P.M. (B.M.A. House, W.C.1.) Dr. Henriette Lohr: Medicine in Holland under German Occupation.

Wednesday, 25th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Wood Jones, F.R.S.: Development and Structure of the Palate.
5 P.M. Dr. L. E. Glynn: Nutritional Factors, Hepatotoxic Agents, and Liver Function.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. J. B. Gaylor: E troencephalography in Retinal Disease.

Thursday, 26th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. D. V. Davies: Development of Joints in Gene
5 P.M. Prof. W. G. Barnard: *Selection of Site and Specific* of Reaction in Inflammation.

Friday, 27th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: The Nerve Plexuses of the Lim
5 P.M. Prof. G. Hadfield: The Reticuloses.
BIOCHEMICAL SOCIETY
11 A.M. (University of Liverpool.) Short communications.

Appointments

BICKFORD, B. J., M.B. Lond., F.R.C.S.: surgical registrar, Liverp Chest Surgical Unit at Broadgreen Hospital.

GOLDMAN, H. P., M.B. Glasg., M.R.C.P.: physician, Bolton Ro Infirmary.

INGHAM, ARTHUR, M.B. Manc.: physician, Bolton Royal Infirma

MOORE, THOMAS, M.D., *M.S. Durh., F.R.C.S.: surgeon,* Duchess York Hospital for Babies, Manchester.

PROBYN-WILLIAMS, R. C., B.M. Oxfd: examining factory surgeo Wotton-under-Edge, Gloucester.

THEOBALD, G. W., M.D. Lond., F.R.C.O.G.: visiting obstetrician a gynæcologist, Royal Infirmary, Bradford.

WARDLE, V. H., M.C., L.R.C.P.E.: examining factory surge Bishop Auckland, Durham.

Colonial Medical Service:

BAIRD, R. B., M.B. Edin.: M.O., Uganda.

BARNETT, Surgeon Lieut.-Commander A. M., M.R.C.S.: M. Tanganyika.

BARRETT, R. E., M.B. Lond., D.T.M. & H.: senior M.O., Uganda.

BARTON, W. L., M.B. Edin.: M.O., Kenya.

BISLEY, Squadron-Leader G. G., M.R.C.S.: M.O., Kenya.

BUCK, Major S. C., M.B. Camb.: M.O. (pathologist), Northe Rhodesia.

BURKITT, Major D. P., M.B. Dubl., F.R.C.S.E.: M.O., Uganda.

CALVERT, MARY, M.B. Belf.: M.O., Nigeria.

CANDLER, Lieut.-Colonel P. L., M.B. Camb.: M.O., Kenya.

CHEVERTON, R. L., M.R.C.S.: A.D.M.S., Nigeria.

CONNELLY, Wing-Commander J. R., L.R.C.P.E.: M.O., Kenya.

CONNOLLY, P. P. D., M.B. Belf.: senior M.O., Tanganyika.

COOMBES, A. H. R., M.R.C.S.: M.O., Hong-Kong.

CUMMINGS, W. L., M.B. Edin.: district M.O., St. Vincent, Win ward Islands.

EVANS, Surgeon Lieutenant A. J.: M.O., Northern Rhodesia.

FRANKS, Surgeon Lieutenant A. C., M.R.C.S.: M.O., Tanganyik

GRIFFITHS, Major P. G., M.C., M.B. Manc.: M.O., Fiji.

GURD, C. H., M.B. Brist.: M.O., St. Helena.

HALL, C. L., B.M. Oxfd: M.O., Tanganyika.

HETREED, V. W. J., B.M. Lond.: M.O., Nigeria.

HIRST, A. E. E., M.B.: M.O.H. (grade C), Trinidad.

HOLLOWAY, *R., M.D.: M.O., Hong-Kong.*

HOWELL, A. T., M.B. Camb.: A.D.M.S., Kenya.

HUGHES, M. H., B.M. Oxfd: M.O., Gold Coast.

KETER, MARY C., M.B. Glasg.: M.O., Nigeria.

LEITCH, NEIL, B.M. Oxfd: M.O., Nigeria.

MCDONALD, J. H., M.B. Aberd.: senior M.O., Tanganyika.

MCKENZIE, A., M.B. Lond.: A.D.M.S., Tanganyika.

NICKLIN, REGINALD, M.B. Birm.: senior M.O., Northern Rhode

O'KANE, R., M.B.: M.O., Malaya.

PHILIP, C. R., O.B.E., M.D. Aberd.: A.D.M.S., Kenya.

SANDERSON, N. D., M.B. Edin.: senior M.O., Northern Rhode

SHEFFIELD, WILLIAM, M.B. Leeds: M.O., Northern Rhodesia.

THOM, W. T., M.B. Edin.: M.O., Tanganyika.

WARNER, O. F., L.R.C.P.E.: M.O. (grade B), Trinidad.

WILLIS, J., M.D.: M.O., Hong-Kong.

Dr. E. H. VAN SOMEREN.—*A footnote* in a recent book o memoirs states that Dr. van Someren, who practised i Venice from 1898 to 1913, suffered from melancholia an committed suicide in Venice. His obituary notices (see *Lance* 1913, i, 793; *Brit. med. J.* 1913, i, 589) make it clear tha he died at Syracuse after a short illness at the age of 41; h was a diabetic and died in coma after contracting influenza.

PERFORATED PEPTIC ULCER

TREATED WITHOUT OPERATION *

HERMON TAYLOR
M.A., M.D., M.Chir. Camb., F.R.C.S.
SSISTANT SURGEON, LONDON HOSPITAL; SURGEON, KING GEORGE HOSPITAL, ILFORD, CONSULTING SURGEON, ENFIELD WAR MEMORIAL HOSPITAL

IT has long been a rule of surgical practice that erforated peptic ulcer should be treated by immediate peration to suture the perforation and drain the perioneal cavity. It is, however, questionable whether all ases of perforation should be lumped together indisriminately in this way. The gravity of the crisis depends ot so much on the fact of the perforation as on the ikelihood of a fatal peritonitis. But the factors which determine this issue—the interval between perforation and treatment, and the amount and character of the leakage from the stomach—vary within the widest limits. Automatic surgical intervention takes no account of his variation, nor does it recognise the existence of the natural defence mechanism within the peritoneal cavity.

It must not be forgotten that the peritoneum, with its copious blood-supply and lymph drainage, its endothelial cells and phagocytes, is specially adapted to overcome infection. It can sterilise and absorb a considerable quantity of infective fluid, provided the contamination is not repeated before the peritoneum has had time to recover from the damage suffered in the process. To state this is to put the problem of perforated ulcer in its proper perspective. Obviously if an infective peritonitis is already established as the result of delayed treatment or gross flooding of the peritoneal cavity there is no alternative to the classical operation, since drainage is essential. But if the contamination which has taken place can be checked at the source without operation, before it has overcome the peritoneal defence, no drainage is necessary, and the patient will recover spontaneously.

A method of achieving this is described here, the effect of which is to reduce the problem in any one case of perforated ulcer to an assessment of the degree of leakage that has taken place. The decision to interfere surgically will depend on this assessment, but in the great majority of cases it will not be necessary, as the present case-reports show.

DEVELOPMENT OF THE CONSERVATIVE METHOD

It will perhaps be useful to describe how I came to make this departure from established practice.

In operating on early perforations in the usual way, I repeatedly found that the peritoneal fluid was sterile on culture, and therefore I began to dispense with the drainage-tube more and more, without encountering any case of delayed peritonitis as a result. But the crucial experience was that from time to time there occurred cases in which I opened the abdomen only to find the erforation already sealed off by adhesion to a neighbouring viscus, usually the under surface of the liver. The firmness with which the adherent surfaces were applied to each other, and the difficulty in separating them to suture the perforation, suggested that this was in fact unnecessary. When a similar case occurred later, therefore, I left the sealed-off perforation undisturbed without any untoward sequelæ, but it was obvious that I had performed a useless operation, having neither drained the peritoneal cavity nor sutured the perforation.

I collected 8 cases of this nature and found that the factor common to them all was that the patient's last meal had been eaten some time before the perforation—i.e., the stomach was relatively empty at the time. Consequently, not without trepidation, I tried to reproduce this condition in early cases by substituting gastric aspiration for operation, relying on the peritoneum to deal with the fluid that had already escaped, and on local adhesion to seal off the dried-up perforation.

The results were satisfactory beyond my expectation. Since January, 1945, 28 consecutive cases have been treated in this way; 24 patients made an uneventful recovery, 3 died from causes unconnected with the treatment, and 1 died who might have been saved by immediate operation, if I had had the experience at the time to recognise the limits of applicability of the conservative method. With the experience that has been gained and is now recorded, such an error in the selection of treatment should be avoidable in future.

CLINICAL PROCEDURE

At King George Hospital, Ilford, when a case of perforated ulcer is received, the decision whether to apply conservative treatment or to operate is made in the receiving-room (see below). If conservative treatment is adopted, the patient receives morphine gr. $^1/_4$ intravenously, repeated if necessary, and sucks a lozenge of amethocaine gr. 1. When thereby his pain and anxiety are dulled and his throat has become insensitive, his stomach is emptied with a large stomach-tube attached to a Senoran's gastric-suction bottle. The tube is then withdrawn, and the patient is sent to the ward. When he has been made as comfortable as possible in bed, a small stomach-tube is passed through the nose and fixed in position, and the stomach is aspirated at half-hour intervals with a 20 c.cm. syringe. The quantity of fluid withdrawn plus three pints in the twenty-four hours is administered rectally, subcutaneously, or intravenously. Small sips can be given, provided they are aspirated out again at once; otherwise nothing is allowed by mouth for the first day. Chemotherapeutic agents may be given by injection if necessary.

The treatment is continued during the second twenty-four hours, but now hourly aspirations are followed by drinks of 1 oz. of water. A mixture of milk and water is substituted on the third day, and the tube is removed when the fluid chart indicates that the amount taken by mouth is passing into the intestine and is not collecting in the stomach. Subsequent treatment is exactly as for acute non-perforated ulcer, with graduated diet, oil, powder, &c.

On this régime pain diminishes rapidly, and the patient is generally comfortable within twelve hours or so. It is interesting to observe the disappearance of the signs progressively from the left lower abdomen towards the epigastrium and right flank, where tenderness may persist for some days. The indwelling tube is a source of discomfort to the patient, but is usually gladly borne when it is explained that the alternative is an operation.

There is usually very little constitutional disturbance, and the pulse-rate remains about normal. Ileus may be expected in the not-so-early perforation, for which it may be necessary to continue the aspiration longer than usual. The limiting factor in the selection of cases is implied in this consideration and will be discussed further. If proper judgment has been exercised, a serious ileus should not develop.

The treatment throws little more strain on the nurses than if the patient had been operated on, but it does require from them an appreciation of the fickleness of stomach-tubes. A dry aspiration should never be accepted as evidence of an empty stomach, unless a small drink by mouth can be immediately withdrawn through the tube.

CASE-RECORDS

The case-records include only unequivocal perforations with full-scale rigidity and tenderness, some being confirmed by the radiological demonstration of gas under

---

* Read before the Society of British Gastro-Enterologists, November, 1945.

Nutrition Society

The society is holding a conference on The Work and Aims of the Food and Agriculture Organisation on Saturday, Sept. 21, at 10.30 A.M., at the London School of Hygiene, Keppel Street, London, W.C.1. The speakers will include Sir John Orr, F.R.S., director-general of F.A.O.; Mr. D. Lubbock; Dr. P. Lamartine Yates; Dr. W. R. Aykroyd; and Miss E. Fautz.

Medical Society of the L.C.C.

There will be a clinical meeting of the society on Thursday, Oct. 3, at 3 P.M., at Dulwich Hospital, S.E.22, when the staffs of Dulwich and St. Olave's Hospitals will demonstrate cases.

Association of Industrial Medical Officers

The annual general meeting of the association will be held at the London School of Hygiene, Keppel Street, W.C.1, on Friday, Oct. 18th, at 5 P.M., and will be followed by a dinner at 7.30 P.M. On Saturday, the 19th, at 10.30 A.M., Dr. Donald Hunter and Dr. R. S. F. Schilling will speak on Industrial Medicine in the U.S.A.

St. Thomas's Hospital

Dr. A. L. Crockford has been appointed secretary of the medical school in succession to Dr. R. J. C. Thompson, who has resigned.

Brazilian Honour

The Brazilian order of the Southern Cross has been conferred on Sir Alexander Fleming, F.R.S., who presided over the Inter-American medical congress which met in Rio de Janeiro this month.

Return to Practice

The Central Medical War Committee announces that Dr. Kenneth O. Black, 27, Weymouth Street, W.1 (Langham 3336), has resumed civilian practice.

Births, Marriages, and Deaths

BIRTHS

DUTTON.—On Sept. 10, in Manchester, the wife of Captain G. C. D. Dutton, R.A.M.C.—a daughter.

HACKETT.—On Sept. 8, the wife of Dr. C. J. Hackett, of Wendover, Bucks—a son.

HIBBERT.—On Sept. 13, in Liverpool, the wife of Dr. Geoffrey Hibbert—a son.

HUSTON.—On Sept. 7, the wife of Lieut.-Colonel John Huston, R.A.M.C., of Edinburgh—a daughter.

LILLICRAP.—On Sept. 12, at Lincoln, the wife of Dr. Charles Lillicrap—a son.

LOGIE.—On Sept. 9, at Aberdeen, the wife of Mr. Norman Logie, F.R.C.S.—a son.

MARRIOTT.—On Sept. 11, in London, the wife of Dr. Ian Marriott—a son.

MAY.—On Sept. 8, at Chatham, the wife of Surgeon Lieut.-Commander R. T. May, R.N.—a son.

PORTER.—On Sept. 6, at Woking, the wife of Dr. H. L. Porter—a son.

SMITH.—On Sept. 7, in London, the wife of Dr. J. F. Smith—a son.

VICARY.—On Sept. 12, Dr. *Patricia Vicary (née Shaw)*, the wife of Dr. Peter Vicary, of London, W.14—a son.

WYNNE.—On Sept. 7, the wife of Dr. Roger Wynne, of Banbury—a daughter.

YUDKIN.—On Sept. 7, the wife of Dr. Simon Yudkin—a daughter.

MARRIAGES

AMBROSE—CLAVERING.—On Sept. 11, in London, Gordon Ambrose, L.M.S.S.A., to Sheila Clavering.

BENNETT—MELLING.—On Sept. 7, at Baylham, Harold Stanley Bennett, M.B., R.A.F.V.R., to Barbara Hunter Melling.

REID—SHARPE.—On August 31, in Calcutta, Grainger Wilson Reid, lieut-colonel R.A.M.C., to Ruth Hilda Sharpe, Q.A.I.M.N.S./R.

WALKER—JONES.—On June 14, in Nairobi, D. O. Walker, major R.A.M.C., to Mary Jones, Q.A.I.M.N.S./R.

DEATHS

BEEVOR.—On Sept. 15, at Burnham, Bucks, Charles Ferrier Beevor, M.A., B.M. Oxfd.

GOLDEN.—On Sept. 8, at Ilford, Michael Bruce Howard Golden, M.R.C.S.

GRAY.—On Sept. 12, at Dalkeith, Midlothian, George Douglas Gray, C.B.E., M.D. Edin., late lieut.-colonel R.A.M.C.

HILL.—On Sept. 8, at St. Mary Bourne, Hampshire, Alfred Arthur Hill, M.D. Durh.

HOWIE.—On Sept. 7, Mary Evelyn Howie, M.B. Durh., of Gosforth, Newcastle-on-Tyne.

PATON.—On Sept. 9, at St. Albans, Herts, Richard Reid Kirkwood Paton, M.B. Glasg., D.P.H.

SLAYTER.—On August 22, in Madras, Edward Wheeler Slayter, C.M.G., D.S.O., M.B. Edin., late colonel R.A.M.C., retd., of Halifax, Nova Scotia.

STREET.—On Sept. 8, at Crowborough, Ashton Street, M.B. Camb., F.R.C.S., lieut.-colonel I.M.S., aged 82.

WILSON.—On Sept. 10, in Cardiff, James William Albert Wilson, M.D. Belf.

Medical Diary

SEPT. 22 TO 28

Monday, 23rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. R. A. Willis: Experimental Production of Tumours.
5 P.M. Dr. N. F. Maclagan: Basal Metabolism.

Tuesday, 24th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. R. A. Willis: Statistical Study of Tumours.
5 P.M. Dr. L. E. Glynn: Nutritional Factors, Hepatotoxic Agents, and Liver Function.
MEDICAL WOMEN'S FEDERATION
8.30 P.M. (B.M.A. House, W.C.1.) Dr. Henriette Lohr: Medicine in Holland under German Occupation.

Wednesday, 25th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Wood Jones, F.R.S.: Development and Structure *of the Palate.*
5 P.M. Dr. L. E. Glynn: Nutritional Factors, Hepatotoxic Agents, and Liver Function.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. J. B. Gaylor: Electroencephalography in Retinal Disease.

Thursday, 26th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. D. V. Davies: Development of Joints in General.
5 P.M. Prof. W. G. Barnard: Selection of Site and Specificity of Reaction in Inflammation.

Friday, 27th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: The Nerve Plexuses of the Limbs.
5 P.M. Prof. G. Hadfield: The Reticuloses.
BIOCHEMICAL SOCIETY
11 A.M. (University of Liverpool.) Short communications.

Appointments

BICKFORD, B. J., M.B. Lond., F.R.C.S.: surgical registrar, Live Chest Surgical Unit at Broadgreen Hospital.

GOLDMAN, H. P., M.B. Glasg., M.R.C.P.: physician, Bolton Infirmary.

INGHAM, ARTHUR, M.B. Manc.: physician, Bolton Royal Infir

MOORE, THOMAS, M.D., M.S. Durh., F.R.C.S.: surgeon, Duch York Hospital for Babies, Manchester.

PROBYN-WILLIAMS, R. C., B.M. Oxfd: examining factory su Wotton-under-Edge, Gloucester.

THEOBALD, G. W., M.D. Lond., F.R.C.O.G.: visiting obstetricia gynæcologist, Royal Infirmary, Bradford.

WARDLE, V. H., M.C., L.R.C.P.E.: examining factory su Bishop Auckland, Durham.

Colonial Medical Service:

- BAIRD, R. B., M.B. Edin.: M.O., Uganda.
- BARNETT, Surgeon Lieut.-Commander A. M., M.R.C.S.: Tanganyika.
- BARRETT, R. E., M.B. Lond., D.T.M. & H.: senior M.O., Ugan
- BARTON, W. L., M.B. Edin.: M.O., Kenya.
- BISLEY, Squadron-Leader G. G., M.R.C.S.: M.O., Kenya.
- BUCK, Major S. C., M.B. Camb.: M.O. (pathologist), Nor Rhodesia.
- BURKITT, Major D. P., M.B. Dubl., F.R.C.S.E.: M.O., Uganda.
- CALVERT, MARY, M.B. Belf.: M.O., Nigeria.
- CANDLER, Lieut.-Colonel P. L., M.B. Camb.: M.O., Kenya.
- CHEVERTON, R. L., M.R.C.S.: A.D.M.S., Nigeria.
- CONNELLY, Wing-Commander J. R., L.R.C.P.E.: M.O., Kenya
- CONNOLLY, P. P. D., M.B. Belf.: senior M.O., Tanganyika.
- COOMBES, A. H. R., M.R.C.S.: M.O., Hong-Kong.
- CUMMINGS, W. L., M.B. Edin.: district M.O., St. Vincent, W ward Islands.
- EVANS, Surgeon Lieutenant A. J.: M.O., Northern Rhodesia.
- FRANKS, Surgeon Lieutenant A. C., M.R.C.S.: M.O., Tangan
- GRIFFITHS, Major P. G., M.C., M.B. Manc.: M.O., Fiji.
- GURD, C. H., M.B. Brist.: M.O., St. Helena.
- HALL, C. L., B.M. Oxfd: M.O., Tanganyika.
- HETREED, V. W. J., B.M. Lond.: M.O., Nigeria.
- HIRST, A. E. E., M.B.: M.O.H. (grade C), Trinidad.
- HOLLOWAY, R., M.D.: M.O., Hong-Kong.
- HOWELL, A. T., M.B. Camb.: A.D.M.S., Kenya.
- HUGHES, M. H., B.M. Oxfd: M.O., Gold Coast.
- KETER, MARY C., M.B. Glasg.: M.O., Nigeria.
- LEITCH, NEIL, B.M. Oxfd: M.O., Nigeria.
- McDONALD, J. H., M.B. Aberd.: senior M.O., Tanganyika.
- McKENZIE, A., M.B. Lond.: A.D.M.S., Tanganyika.
- NICKLIN, REGINALD, M.B. Birm.: senior M.O., Northern Rhod
- O'KANE, R., M.B.: M.O., Malaya.
- PHILIP, C. R., O.B.E., M.D. Aberd.: A.D.M.S., Kenya.
- SANDERSON, N. D., M.B. Edin.: senior M.O., Northern Rhod
- SHEFFIELD, WILLIAM, M.B. Leeds: M.O., Northern Rhodesia.
- THOM, W. T., M.B. Edin.: M.O., Tanganyika.
- WARNER, O. F., L.R.C.P.E.: M.O. (grade B), Trinidad.
- WILLIS, J., M.D.: M.O., Hong-Kong.

DR. E. H. VAN SOMEREN.—A footnote in a recent boo memoirs states that Dr. van Someren, who practised Venice from 1898 to 1913, suffered from melancholia committed suicide in Venice. His obituary notices (see *La* 1913, i, 793; *Brit. med. J.* 1913, i, 589) make it clear t he died at Syracuse after a short illness at the age of 41; *was a diabetic and died in coma after contracting* influen

CASE 13.—Man, aged 67, with history of chronic bronchitis, angina of effort, 10 years' history of dyspepsia; ulcer perforated for 3 hours, 9 hours after a meal. Pain-free in 24 hours. Tenderness gone in 3 days. An ill man on admission. Doubtful if he would have survived operation. Steady recovery on aspiration.

CASE 14.—Man, aged 47, with 18 months' history of duodenal ulcer; perforated for 2 hours, 4 hours after a meal. Pain lasted 2 days on aspiration. Tenderness in right flank persisted 6 days—subsided. Steady recovery, though slower than usual.

CASE 15.—Man, admitted moribund, aged 65, with chronic phthisis, chronic retention of urine, repeated melæna, 12 months' history of failing health, 10 years' history of dyspepsia; ulcer perforated for 24 hours.

It was intended to operate on this patient if he could be improved sufficiently. Aspirated 11 hours until death. At necropsy two ulcers were found, one on middle of lesser curve, and one prepyloric, which had recently perforated and been sealed off by liver. Thin peritoneal fluid, not cultured. Tuberculous lungs, degenerate myocardium.

Case 16.—Man, aged 50, with 10 years' history of dyspepsia; perforated $2\frac{1}{2}$ hours. Patient had drunk two pints of beer to relieve pain. Pulse-rate 120. Uncontrollably restless, fought the nurses, pulled out his stomach-tube, drank his mouth-wash. Tenderness diminished under treatment, but abdomen became distended and remained so. After enema on third day patient had another sudden pain and condition deteriorated. Re-perforation diagnosed.

Operation (C. A.) in extremis. Suprapubic drainage of pouch of pus. Patient died 3 hours later. Necropsy showed anterior duodenal ulcer, not adherent. A ring of fibrin round it and on the under surface of the liver suggested that the two surfaces were adherent at one time and had separated again. Dilated intestines. Loculations of pus in various parts of abdomen. Death from peritonitis and ileus.

I should have operated on this man in view of the beer he had drunk and his resistance to the treatment.

CASE 17.—Man, aged 26, with 3 years' history of duodenal ulcer; perforated for 4 hours, 2 hours after a meal. General tenderness persisted 48 hours before resolving. Pulse-rate 112, slowly decreased. Residual tenderness in right flank subsided after 6 days. Rather delayed resolution followed by steady recovery.

CASE 18.—Man, aged 41, with 12 years' history of duodenal ulcer; ulcer perforated 2 hours before admission, while patient was at luncheon. General pain disappeared in 4 hours. Tenderness in right side lasted 24 hours. Uninterrupted recovery.

CASE 19.—Man, aged 32, with 4 years' history of duodenal ulcer; perforated for $1\frac{1}{2}$ hours, 3 hours after a meal. Pain gone in 24 hours, tenderness gone in 48 hours. Uninterrupted recovery.

CASE 20.—Man, aged 46, with 16 years' history of duodenal ulcer; perforated 6 hours. Pain subsided in 24 hours, tenderness gone in 4 days. Uninterrupted recovery.

CASE 21.—Man, aged 63, with hyperpiesis, dyspnœa, and cyanosis, and 2 years' history of dyspepsia; perforated $4\frac{1}{2}$ hours. Pain subsided in 3 days. Patient nearly died of heart-failure in first 3 days. Diagnosis of perforation proved by gas under right dome of diaphragm; patient could not have survived operation.

CASE 22.—Man, aged 65, with chronic bronchitis, dyspnœa, 30 years' history of duodenal ulcer; perforated 2 hours. Tenderness subsided in 3 days. Uninterrupted recovery.

CASE 23.—Man, aged 28, with no history of previous dyspepsia; perforated for 1 hour, 4 hours after a meal. Pain subsided in 6 hours, tenderness gone in 2 days. Uninterrupted recovery. Radiography showed duodenal ulcer.

CASE 24.—Man, aged 23, with 7 years' history of duodenal ulcer; perforated for 5 hours, 1 hour after a meal. Smooth rapid subsidence of pain. Uninterrupted recovery.

CASE 25.—Man, aged 31, with 10 years' history of duodenal ulcer; perforated for 1 hour, $\frac{1}{2}$ hour after tea. Pain subsided in 2 days. Tenderness persisted 3 days, with slight degree of ileus. Slow but steady recovery.

CASE 26.—Man, aged 36, with 16 years' history of duodenal ulcer; perforated for 3 hours, 6 hours after a meal. Pain gone in 6 hours, no tenderness after 3 days. Uneventful recovery.

CASE 27.—Man, aged 50, with 10 years' history of dyspepsia; perforated while visiting wife in hospital. Gas below diaphragm. Pain gone in 24 hours, no tenderness after 4 days. Uneventful recovery.

CASE 28.—Man, aged 65, with 20 years' history of dyspepsia; perforated 8 hours, 1 hour after a meal. Low vitality; cold and collapsed. Pain subsided in 12 hours, tenderness in 3 days. Uneventful recovery. Gastroscopy on 10th day showed a healing lesser-curve ulcer at the incisura. Doubtful if he would have survived operation.

MORTALITY AND MORBIDITY

Several of the patients were very poor surgical risks indeed and would have stood little chance with operation. Cases 5, 13, 15, 21, and probably 22 and 28 may be placed in this category without postulating any postoperative complications in the others.

Mr. Ian Soutar, my house-surgeon, investigated the hospital results under the old régime to compare with those we were obtaining, and to sustain our wavering morale after the tragedy of case 16. He found that in the preceding five-year period there were 77 perforated ulcers of less than twenty-four hours' duration, the average time being five and a half hours. Of these patients 14 died, a case-mortality of 18%. More than half the deaths were due to heart-failure or to pneumonia, an interesting comment on the bad-risk cases that were *not* operated on in my series. The postoperative morbidity-rate *among the survivors* was 46%, half of these being from pulmonary disease, and a quarter being associated with wound infection, breakdown, or subsequent hernia. It is obvious that there is a great deal to be gained by not operating if this can be achieved.

The 24 patients who recovered left hospital in 2–4 weeks. If it be conceded that the pulmonary embolus, the intestinal obstruction, and the moribund patient may be excluded from consideration of the mortality incurred by the conservative method of treatment, the result is 1 death in 25 cases. As a first series, these figures are promising, and they may be improved by further experience if a repetition of case 16 can be avoided.

DISCUSSION

If these early results are confirmed by further experience, it will seem that, in a district where the medical organisation is good, most patients with perforated ulcer admitted early to hospital need not be submitted to operation. Surgical intervention should be reserved for late cases, patients with pyloric stenosis and gastric dilatation, and those who have ingested a large quantity of fluid just before or after the perforation.

For sparsely populated districts, ships at sea, or any case where trained surgical help is not immediately available, the treatment described above, or a modification of it, may be given by a general practitioner or a nurse, or on board ship possibly by an untrained person, if a stomach-tube and syringe are available. Gastric aspiration should certainly be used in any case of perforation that has to wait long for a surgeon.

In this series all the perforations except two were duodenal; it remains to be seen whether gastric perforations behave similarly.

SUMMARY

Early perforations will seal themselves if the stomach is emptied and kept empty by aspiration.

Gastric contents in the peritoneal cavity will be sterilised and absorbed if the leakage is not gross and the contamination is not repeated.

Of a consecutive series of 28 perforations treated by gastric aspiration instead of operation, 24 patients recovered. Of the 4 deaths, 3 were not related to the conservative method of treatment.

It is suggested that the technique described is worthy of extended trial in early cases, operation being reserved the diaphragm. Three cases of doubtful perforation or limited leakage from an ulcer that occurred during the period of the experiment are not included in the list. There was one case of mistaken diagnosis during this time: a man, aged 56, subject to dyspepsia, who had had a sudden continuing pain four hours previously. There was generalised tenderness and rigidity of the abdomen, and he was treated by aspiration on a diagnosis of perforated ulcer. Persisting abdominal signs and a steady rise in pulse-rate, however, led to operation on the second day, when a tense gall-bladder was found and treated successfully by cholecystostomy. Two perforations in the series (case 6 and case 9) were also subjected to operation on the second day because of persisting generalised abdominal tenderness. In each of these the perforation was found to be sealed, but collections of sterile fluid in the pelvis and right flank were successfully drained. It may or may not have been necessary to do this, but the point to be made from these cases and that of the acute cholecystitis is that, if an expectant attitude is maintained in the management of the patients, no harm need result from the delay in operation.

In the early cases of the series one was, naturally perhaps, too ready to interfere and perform an intercurrent operation. Thus in case 3 one of my assistants inserted a suprapubic drainage-tube, which unfortunately gave rise to a fatal mechanical obstruction of the small gut in the pelvis. Another patient died from a pulmonary embolus on the fourth day of conservative treatment (case 10). Necropsy showed a sealed perforation, and a collection of sterile fluid in the right flank, besides the fatal clot. A third fatality was a man, aged 65, admitted twenty-four hours after perforating, too ill to be operated on (case 15). He was treated by aspiration for eleven hours in the vain hope that he would recover sufficiently for operation. Necropsy showed a sealed lesser-curve ulcer. None of these deaths was due to the treatment; indeed in case 3 the fatal issue must be attributed to the substitution of operation and drainage, though this was accidental.

In case 16 the method was a tragic failure. The patient, a huge unruly Irishman, had drunk two pints of beer after his perforation and was quite uncontrollable in the ward, drinking his mouth-wash and pulling out his stomach-tube. Obviously he should have been operated on, but this was put off till too late. He developed a loculated peritonitis and a severe ileus, which proved fatal on the fifth day. The case indicates the two chief contra-indications to the conservative method of treatment in an early case—inability of the patient to accept the treatment quietly; and the presumptive presence of large quantities of fluid (in this case beer) in the peritoneal cavity. The same consideration would apply when the stomach is dilated behind an obstruction, such as a stenosing ulcer, unless treatment has been prompt. Too much must not be asked of the peritoneal defence, and a limit must be recognised to the applicability of the treatment from this point of view. That this limit is fairly wide is suggested by the fact that the 28 cases were consecutive, though manifestly the sequence should have been interrupted by one case for operation.

CASE-REPORTS

CASE 1.—Man, aged 49; long history of duodenal ulcer; perforated 4 hours. Gastric aspiration for 10 hours. Pain and tenderness diminished. Assistant (P. H.) operated "to make sure perforation was really sealed." This was confirmed, and 10 oz. of sterile fluid was removed from peritoneal cavity. Recovery.

CASE 2.—Man, aged 31, with 6 years' history of duodenal ulcer; perforated 3 hours. Conservative treatment. Rigidity and tenderness subsided in 2 days. Patient went home in 3 weeks.

CASE 3.—Man, aged 57, with 3 years' history of duodenal ulcer; perforated 7 hours, 2 hours after a meal. Pain and tenderness subsided with 48 hours' aspiration, but abdome was rather distended. Pulse-rate 100–110.

Assistant (R. E. R.) operated on diagnosis of ileus after 2 da Suprapubic incision only; 2 oz. of sterile fluid removed. T inserted. Patient improved for 2 days, then distensi increased, and patient looked worse. Pulse-rate slowly Patient improved with Miller Abbott tube but continued

Operation (H. T.) after 7 days. Obstruction of small gut pelvis, dilated above and collapsed below an adherent kn where suprapubic tube had been. This was freed, but patien died 6 hours later.

At necropsy perforation was found to be securely sealed b liver. No intraperitoneal collection of fluid. Death fro toxæmia of intestinal obstruction due to the drainage-tube.

CASE 4.—Man, aged 52, with 10 years' history of duodena ulcer; perforated 3 hours, $^1/_2$ hour after a meal. Pain dis appeared after 12 hours' aspiration. Tenderness gone in 3 days Home in 4 weeks. Uneventful recovery without operation.

CASE 5.—Man, aged 61, with 15 years' history of duodenal ulcer; perforated 5 hours, soon after a meal. Poor physique, chronic bronchitis and emphysema. Dyspnœa on exertion. Enlarged prostate and chronic retention.

Pain and tenderness subsided with 48 hours' aspiration. Distension amounting to ileus persisted 5 days and the subsided. He recovered after some anxiety regarding th ileus. A very poor operation risk.

Twelve months later he was operated on for recurrence o symptoms: duodenal ulcer with membranous adhesions t liver. Gastro-enterostomy. Recovery.

CASE 6.—Man, aged 24, with 2 years' history of dyspepsia; perforated 2 hours, having had a meal 2 hours before. Patient improved with 18 hours' aspiration, but tenderness and rigidity remained diffuse. Operation (H. T.) therefore undertaken as precaution. Pyloric region adherent by fibrin to liver, not disturbed. Two ounces of peritoneal fluid—sterile. No drain. Patient did well as regards abdomen. Postoperative persistent fever and cough. Sputum containe tubercle bacilli. Radiography showed tuberculosis of left ape Patient was last heard of in a north Irish sanatorium, doi well.

CASE 7.—Man, aged 35, with 15 years' history of duoden ulcer; perforated 4 hours. Pain-free after 24 hours' aspiratio home in 2 weeks. Uneventful recovery.

CASE 8.—Man, aged 23, with 4 years' history of duoden ulcer; perforated $1^1/_2$ hours. Pain-free after 24 hours' aspir tion, abdomen soft in 48 hours. Uneventful recovery.

Subsequent recurrence of ulcer. Operation 4 months late Membranous adhesions between ulcerated duodenum an liver. Gastro-enterostomy. Recovery.

CASE 9.—Man, aged 45, with 4 years' history of duoden ulcer; perforated $3^1/_2$ hours, 1 hour after a meal. Patie improved after 28 hours' aspiration. Persistent gener though diminished rigidity and rising pulse-rate indicate operation (H. T.). Perforated duodenal ulcer found sealed o by liver. Peeled off and sutured. Collections of fluid i pelvis and right flank each drained with tube. Fluid steril

Patient did well. Operation was probably necessary t drain the fluid. Nothing was lost by 28 hours' delay. Flui was sterile, and ulcer sealed off.

CASE 10.—Man, aged 36, with 18 years' history of duodena ulcer; perforated $1^1/_2$ hours, 3 hours after a meal. Pai subsided in 6 hours. Tenderness persisted in right flank where a fullness indicated a fluid collection. This persiste 4 days, and local drainage was decided on. While bein prepared for operation, patient "went black" and die instantly.

At necropsy pulmonary artery and right auricle were foun filled with curled up ante-mortem clot from deep iliac an inferior caval veins. Death from pulmonary embolism Sterile collection of clear yellow fluid in right subphreni space. No peritonitis. Duodenal perforation well sealed of by liver.

CASE 11.—Man, aged 36, with 1 year's history of duodena ulcer; perforated for 2 hours, 1 hour after a meal. Pain-fre after 6 hours' aspiration. Tenderness gone in 2 days Uneventful recovery.

CASE 12.—Man, aged 26, with 2 months' history of dyspepsia perforated for 3 hours, $^1/_2$ hour after a meal. Pain-free afte 24 hours' aspiration. Tenderness in right flank persisted 4 days. Given penicillin as temperature was 102° F. Uneventful recovery. Radiography showed pylori ich had been exposed for $^{1}/_{2}$ hr. were brown, 1 hr. pink, d 2 hrs. red. A small area of the back exposed to an ultra-olet lamp on Jan. 14 gave a mild erythematous reaction ter a $^{1}/_{2}$-min. exposure at a distance of 2 ft.; an equally ond patient did not react to twice this dosage.

DESENSITISATION

Shock in penicillin therapy raises two questions: (1) hether a penicillin-sensitive patient in immediate need f injections of this drug, and having reacted with an naphylactic shock to a full injection dose, can be even emporarily desensitised with injections of small and increas-ng doses of penicillin at short intervals, given in the Bezredka tyle to prevent serum shock, so that full-dose therapeutic njections can be started without delay; and (2) whether patient can be desensitised by continuous administration small doses of penicillin for a longer period.

In an attempt to find an answer to the first question 100 nits of American sodium penicillin was injected under the kin with the intention of repeating the injection a short ime later, intramuscularly, with increasing doses. After 5 min. the patient, Bdr. A, experienced shock similar to that aused by the first injection of 15,000 units, but less intense nd less prolonged.

It is probable that starting with smaller doses we could eventually inject a full dose without incident, but such a technique would require a long time, many injections, and much discomfort for the patient. The problem of urgency could not be solved in this way. It remained to try the oral route used by Lieut.-Colonel C. J. H. Little and Captain G. Lumb, of the Central Pathological Laboratory, M.E. Their communication (Little and Lumb 1945) was published after our experiment had started with Lieut.-Colonel Little's counsel.

Fifteen minutes before the administration of penicillin, 4 oz. of milk mixed with one teaspoonful of sodium bicarbonate was given to the patient to drink. Fifteen minutes later American sodium penicillin 15,000 units in 2 oz. of milk, beaten up with a raw egg and a little sugar added for flavour, was given by mouth.

On Feb. 23 the first dose of penicillin was given by mouth. After $1^{1}/_{2}$ hrs. the patient complained of a burning sensation on the face. About $2^{1}/_{2}$ hrs. after the dose the face became pink and later turned red. The redness gradually increased in intensity and spread down the neck, and a mild œdema of the cheeks and eyelids appeared. The colour of the face returned to normal 10 hours after the first dose, but the skin of his rt. ear was irritating and discharging; during this time the patient was in bed and out of the sun.

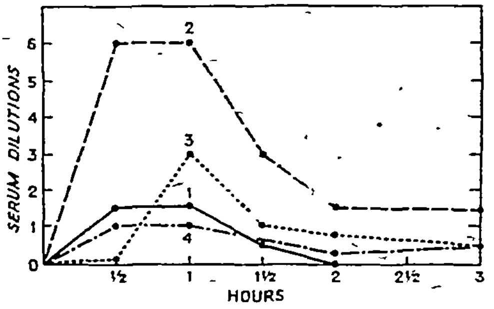
Next day, before having his second dose, the exuding dermatitis round the rt. ear had increased, and the redness of the whole face had reappeared, with more fine scaling as compared with his condition before the treatment began. The temperature and pulse-rate continued normal, and the general feeling good. The blood-count did not vary. On this 2nd day the patient had three doses orally of penicillin 15,000 units each at 3-hr. intervals. After each dose the same skin reactions were noticed as after the first.

Two days after the beginning of the desensitisation treatment, after four doses of 15,000 units in all, the face was very sore and the rash had extended gradually to the whole of his face. The area of exudative erythema increased, and there was much more scaling of the forehead and scalp. The temperature and pulse still remained normal, but the white-cell count rose to 16,000, with an unchanged differential count. In the next 24 hrs. the patient received eight doses of 15,000 units at 3-hr. intervals. He then, Feb. 26, complained of general malaise and was a little drowsy. The orbits, cheeks, ears, and lips were very swollen and red. The ears and the angles of his mouth were moist and fissured. The rest of the face, neck, scalp, and upper part of the sternum were papular, red, and scaling. The rt. foot, the one which was initially sprayed with penicillin, was now red and moist. The groins and scrotum were slightly red.

The daily doses were subsequently decreased to four given at 3-hr. intervals as before and then gradually again increased to eight as the symptoms subsided after ointments. On the 12th day of oral penicillin, March 3, the face, foot, and groin were dry and peeling. The patient then had eight doses of 15,000 units daily, without any other discomfort than a transient mild diarrhœa and frequent micturition. He was well enough to be up. The white-cell count gradually decreased to remain about 9000, with a normal differential count, until the completion of desensitisation Frequent analyses of the urine showed no abnormality.

On the 13th day of treatment, March 7, the patient received a subcutaneous injection of American penicillin 100 units without showing or feeling any reaction. The next day he received an intramuscular injection of 15,000 units without any general effect. There was a slight soreness and an increase of peeling on the face within 24 hrs. The 3-hourly full oral doses were continued for another 5 days and then stopped.

To estimate progress, penicillin spray with the 200-unit solution was again tried on the patient's face on March 13. After four applications the face became red, sore, and irritating. Although this reaction was much milder than before desensitisation was started, the skin was still sensitive. American penicillin 15,000 units was injected the next day, to see if such a dose could still be tolerated without anaphylactic shock. No ill effect was observed.



Bacteriostatic power of serum after oral administration of 15,000 units of penicillin. Curve 1: three days after start of desensitisation course. Curve 2: sixteen days later. Curve 3: after completion of desensitisation course. Curve 4: control.

Because of the partial state of skin desensitisation, oral penicillin was resumed at the rate of six daily doses of 15,000 units each, at 3-hr. intervals, so as not to disturb the patient in the night. This was continued for a further 11 days, without producing any general or skin symptoms. The desensitisation treatment had now lasted 30 days. The penicillin sprays on Bdr. A's face were repeated on March 16 and again were followed by puffiness of the eyelids, reddening of the cheeks and neck, and exudation on a very small area below the ear lobules.

On April 4 Bdr. A's face was sprayed with a solution containing 10 units of penicillin per c.cm. to ascertain the degree of remaining sensitivity of the skin after 30 days of desensitisation therapy. There was no reaction.

On April 9—i.e., 2 weeks after oral penicillin was stopped—his face was again sprayed with the 200-unit solution five times at 3-hr. intervals. Only a mild peeling and two small areas, about $^{1}/_{4}$ in. across, of dried-up exudate were noticed under each ear lobule the following morning; so small a reaction needed no treatment.

Walking in the sun for about 1 hr. next day provoked a peeling and slight redness of the ears and round the nose. Small squares of his back, exposed for $^{1}/_{2}$ hr., 1 hr., and 2 hrs. to the M.E. midday sun of April now gave the same reaction as on a normal blond control patient. Experimental exposures of small squares of his back to a quartz mercury-vapour lamp gave a very faint erythema after $^{1}/_{2}$-min. exposure. With continued exposures of his face to the sun the intensity of the actinic reaction gradually decreased, and on April 25 his face did not react to a 3-hr. exposure to the sun.

PENICILLIN CONTENT OF BLOOD-SERUM

Estimations of the penicillin content of the blood-serum were carried out for us. The first estimation was done in the blood drawn off 3 days after the beginning of the desensitisation treatment. Bdr. A had already had thirteen doses of 15,000 units each of penicillin. The estimation was repeated on 3 consecutive days (see figure, curve 1). Another estimation was made 16 days later, just before oral penicillin was stopped and 5 days after the patient had been tested with an intramuscular injection of 15,000 units, without producing anaphylactic shock (see figure, curve 2). The final estimation was made on April 13 after the last spray test on the face, 2 weeks after the end of oral treatment with penicillin; so, to make the conditions similar to those at the previous blood estimations, Bdr. A was given another nine doses of sodium penicillin, 15,000 units each, at 3-hr. intervals before the test (see figure, curve 3). The control (see figure, curve 4) was also given nine doses of sodium penicillin by mouth before the test.

These estimations were made for us by Lieut.-Colonel Little, R.A.M.C., on blood samples taken off $^{1}/_{2}$ hr., 1 hr., $1^{1}/_{2}$ hrs., 2 hrs., and 3 hrs. after oral administration of the for cases with gross flooding of the peritoneal cavity or late cases with established peritonitis.

The conservative method can be applied where surgical help is not available.

My thanks are due to the nursing staff of King George Hospital, Ilford, for their enthusiastic coöperation in this work; and to the resident surgical officers, Mr. R. E. Raynaud and Mr. Charles Allen, to the surgical registrar, Mr. Philip Hopkins, and to my house-surgeons, Mr. Ian Soutar and Mr. M. J. Whelan, on whose clinical judgment and reports I largely relied in the management of my cases.

SENSITIVITY TO PENICILLIN

ANAPHYLAXIS AND DESENSITISATION

W. J. O'DONOVAN
O.B.E., M.D. Lond.
LIEUT.-COLONEL R.A.M.C.
ADVISER IN DERMATOLOGY, MIDDLE EAST
PHYSICIAN, SKIN DEPARTMENT, LONDON HOSPITAL

I. KLORFAJN
M.D. Brux.
CIVILIAN MEDICAL PRACTITIONER ATTACHED TO A MILITARY HOSPITAL, MIDDLE EAST

ONLY a *few cases of skin sensitisation to penicillin* have been reported up to now in the medical journals available in the Middle East. Pyle and Rattner (1944) reported one case of epidermal sensitivity, and Binkley and Brockmole (1944) two cases. Silvers' case (1944) was in a chemist engaged in penicillin research. Criep (1944) reported a case of acquired allergy to penicillin after repeated intramuscular injections; generalised urticaria developed on the resumption of injections after an interval of ten days. Two patients who had been *treated with penicillin sprayings for skin affections* were admitted to a military hospital in the Middle East because their skin condition had worsened while under treatment. On examination they were found to be skin-sensitive to penicillin.

One of them, the subject of this report, was given an intramuscular injection of 15,000 Oxford units of penicillin and responded with a violent anaphylactic shock. He willingly submitted to experimental investigations and attempts to desensitise him with injections and later by oral administration of penicillin. The second patient was unwilling to undergo extensive experimental investigations, and will not be referred to further. *Importance is attached to the first case not only because desensitisation was successfully produced but also because it was done by the oral administration of penicillin.*

CASE-RECORD

Bombardier A, aged 30, gave no history of serious general diseases or accidents. He had always had a dry scalp and thin hair. About 14 years ago he had a mild rash in his groins for a few days. In England the summer sun regularly caused some dryness and peeling of the skin of his face. There was no history of asthma, hay-fever, eczema, or migraine in him or his relations, nor of any idiosyncrasy. He had spent six months in the M.E. before his admission to hospital. The sun in the M.E. did not affect his skin more than it used *to in England.* In June, 1944, some fissures appeared on the webs of the left foot with irritation. When these had been present for 3 weeks he showed them to the M.O. of his unit, who ordered three-hourly sprays of penicillin 200 units per c.cm.; this spraying was done five times daily for a week, without noticeable benefit. The skin subsequently cleared with bland ointments.

In October, 1944, he had an abscess over the left jaw, and penicillin sprays were again used for three days before incision. Two weeks later a rash broke out on the lower part of his face and on his left foot. He was admitted to the skin department of this hospital, where he was treated for two weeks as for seborrhœa with ointments of zinc oxide, castor oil, olive oil, and lime water, and the foot and face cleared. On Dec. 4, 1944, when on duty, his foot condition recurred and he was admitted to the *regimental sick-quarters* for ten days, where his foot was again sprayed five times daily. At the end of this time the condition of his foot had worsened and an eruption had broken out on his face.

CONDITION ON ADMISSION

On admission to the hospital on Dec. 14 he was noted t an active, intelligent, fair-haired, and slightly bald weighing 143 lb., B.P. 120/85 mm. Hg, with no visceral or nervous disease. The blood-count and urine normal. His face, forehead, and the front of his neck red. *There was a mild œdema of the* upper lip and ro nose and eyebrows, and a vivid small papulomacular rash his cheeks and the front of the neck. The dorsa of the toes and foot were red, slightly swollen, and shiny. No fu were found microscopically in scrapings from the affect skin areas. This history suggested an abnormal response his skin to penicillin *applied externally.*

PATCH TEST

A solution of penicillin containing 200 units per c c was applied on scarified and unscarified areas on his ba A fourfold pad of lint was soaked in penicillin and appl five times daily at 3-hr. intervals through a windowed occ ding square of 'Elastoplast.' As a control, on two ot areas the pads soaked in penicillin were left unchanged u taken off. The scarified area where the pad was chang three-hourly became red, mammillated, and moist—i.e., posit —after 21 hrs. All the others, changed or unchanged, beca *equally positive 48 hrs. from the first application.*

INTRADERMAL TESTS

An intradermal test was carried out with 0·2 c.cm. of sali containing 4 units of sodium penicillin. This produced a blush with a paler central weal after 3 hrs. The lo erythema persisted for over 2 weeks. The same amou of normal saline injected intradermally into the other a produced an erythema which disappeared after 48 hrs.

SPRAY TESTS

To confirm the diagnosis we sprayed the patient's fac and foot with a solution of *penicillin containing* 200 uni per c.cm. three-hourly. After five sprayings his face becam vividly red, swollen, and covered with an oozing fragi vesicular eruption. He complained of a severe local itchi and burning sensation. The foot reacted similarly but n so much.

ANAPHYLACTIC SHOCK

On the 17th the patient was given an intramuscular inje tion of 15,000 units of sodium penicillin (American man facture) in a surgical ward. Aseptic precautions were observe and the solution was taken from a rubber-capped bottle whi was in use also for other patients. Just before the injecti his pulse-rate was 64 per min., temperature 97·4° F, a white-cell count 8000 per c.mm. (polymorphs 71%, eosin phils 6%, lymphocytes 20%, and monocytes 3%). Fifte minutes after the gluteal injection his pulse-rate rose to 8 and he complained of a throbbing in his face; five minut later he complained of breathlessness, the pulse-rate becam very quick, and soon afterwards he was restless, very pal cold, and covered with a cold sweat, and then his bed w shaken by a violent rigor; his teeth chattered, his breathin was shallow, and his pulse thready and its rate uncountable he slowly recovered, being tired and weak for a couple of day His white-cell count about 3 hrs. after the shock was 10,20 per c.mm. (polymorphs 58%, eosinophils 3%, lymphocyte 29%, and monocytes 10%). His temperature remained norma

Six hours after this injection into the buttock, the patient' face swelled, reddened, and oozed all over. His right ey which was already showing mild conjunctivitis, became ve red and weeping, with some photophobia.

SENSITIVITY AFTER SHOCK

A penicillin patch test was again applied as before t determine whether this notable unexpected anaphylacti shock from the penicillin had desensitised him. The teste areas were irritating and pink—i.e., moderately positive *on the next day* and became markedly positive on the thir day. *On Jan. 17, 1945,* a limited area of his face was agai sprayed at 3-hr. intervals with the 200-unit solution penicillin. This produced a severe local reaction, the ski becoming red, swollen, and moist, a condition which laste eleven days.

ACTINIC REACTIONS

On Jan. 10, 1945, Bdr. A casually exposed himself to th M.E. winter sun. Approximately 2 hrs. later a moi red rash appeared behind his ears. As an experimen squares of his back were exposed to the sun on the afternoo of Jan. 11 through windowed black paper; next day the site

(d) *Dried stomach+vitamins:* 'Ventron' (P.D. CO.) two psules three times daily. Each capsule contains: ventrilin concentrate gr. 5 (equivalent to 1 g. original ventriculin); iamine 20 I.U.; riboflavine 5 Sherman units; and iron and dium citrate gr. 2 (0·13 g.).

(e) Details of the *protein hydrolysates* and the mode of ministration are mentioned in the text.

RESULTS

The results with the various forms of treatment used re summarised in the table.

ESPONSE OF 161 INFANT PELLAGRINS TO VARIOUS FORMS OF TREATMENT IN COMBINATION WITH A FULL DIET

Treatment	Total cases	Improved	Died
		%	%
Diet alone	10	6 (*60*)	4 (*40*)
Diet and vitamins	36	8 (*22*)	28 (*78*)
Liver extract (injection) ..	10	7 (*70*)	3 (*30*)
Oral liver extract + vitamins ..	15	4 (*27*)	11 (*73*)
Protein hydrolysate	20*	6 (*30*)	12 (*60*)
Dried stomach	50	47 (*94*)	3 (*6*)
Dried stomach + vitamins ..	20	13 (*65*)	7 (*35*)

* Two of these cases deteriorated so rapidly that treatment was changed.

Dried Stomach.—The case-mortality (6%) among the 50 cases receiving ventriculin is by far the lowest recorded for this malnutritional syndrome. In the small number of cases that die, even after ventriculin, the histological appearances of the livers differ in some important respects * from the most severely fatty livers of infants previously described (Gillman and Gillman 1945a, b, c, d).

Ventriculin breaks the vicious cycle operating in malnourished infants. This is evident from the sudden diuresis and the gradual disappearance of fat from the liver. Once this is achieved further treatment with ventriculin is unnecessary and the infant is capable of utilising effectively the constituents of a hospital diet.

Although gastric extracts have, thus far, proved successful in our hands, it is very likely that the vicious cycle may be broken by other methods, which remain to be discovered.

Dried Stomach and Vitamins.—The addition of vitamin concentrates and iron (thiamine and riboflavine) to ventriculin, as in the preparation ventron, significantly diminishes the effectiveness of the gastric extract, for the case-mortality among the ventron-treated cases was 35%. This chance finding was virtually forced on us by the fact that ventron, for a time, was the only form of gastric extract available to us.

Liver Extract by Injection.—In the absence of ventriculin, liver extract by injection is the treatment of choice. The case-mortality with this was 30% (see table).

Oral Liver Extract+Vitamins.—When liver extract is administered by mouth in combination with vitamins (thiamine, nicotinic acid, and cod-liver oil) the case-mortality rises to 73%. In a group of children treated with vitamins in conjunction with the hospital diet the case-mortality rose to 78%, the highest yet recorded by us for this syndrome. Most of these cases were treated by other physicians attending at the hospital. They were either unaware of the value of liver extracts and ventriculin or they were unable to obtain these products and therefore persisted with large doses of vitamin concentrates given orally and parenterally.

It may well be that the extremely high mortality was due to the massive doses of synthetic vitamins administered to these malnourished infants (up to 120 mg. thiamine and 300 mg. nicotinic acid daily, together with cod-liver oil). This we suspect from the fact that vitamins, added to ventriculin or liver extracts, were associated with an increased case-mortality (see table).

Protein Hydrolysates.—Our results with protein hydrolysates were most disappointing. Having read the numerous reports eulogising the value of these hydrolysates we had hoped that our cases might have responded to this new form of treatment.

The only reason for persisting with protein digests in the face of such discouraging results is that, from time to time, new preparations became available and it was thought that one of these might ultimately prove useful. Three different types of protein hydrolysates were used in the following manner:

(*a*) A local casein digest: 1 g. three times daily as a broth (8 cases).

(*b*) 'Pulvesco': a whale-meat digest kindly supplied by Dr. B. A. Dormer, chief tuberculosis officer for the Union. As directed, the children received one teaspoonful of this powder three times daily, together with 'Casec' feeds (5 cases).

(*c*) 'Pronutrin': an enzymatic digest of casein (7 cases). Our patients received the recommended dose—2 g. of pronutrin per kg. of body-weight per day. The dose was gradually increased, as recommended, to 4 g. per kg., which was given in 500–1000 c.cm. of 5% glucose saline. The total volume of fluid was administered by intragastric drip, only 50–100 c cm. being allowed to enter the stomach in an hour. This small amount of fluid was run in every alternate hour, day and night.

All the 8 patients treated with a locally prepared casein hydrolysate died within three to five days. Our experience with the last 3 cases of the series discouraged us from further trial of this product. These were admitted on the same day and were treated concurrently. For no apparent reason 2 developed temperatures of 105° F within 24 hours. No cause for this unusual pyrexia could be discovered at autopsy. We were led to suspect that the therapy, at least in part, was a contributing factor, especially as a similar instance of hyperpyrexia following the administration of protein hydrolysates has recently been described (Curreri et al. 1945).

Five cases were treated with pulvesco. Slow recovery was noted in 2 of these cases, while the remaining 3 died.

Pronutrin was also unsatisfactory in the 7 cases treated. Two cases, initially considered mild, both on clinical grounds and on the basis of the liver structure, deteriorated so rapidly that after four to six days the treatment was changed in the interest of the patients. Of the remaining 4, 1 recovered rapidly and the other 3 very slowly; 1 patient died.

The recent literature contains reports of the ineffectiveness of the majority of protein hydrolysates in the treatment of hypoproteinæmia in dogs (Madden et al. 1945). Severe hypoproteinæmia with œdema and anæmia has even been *produced* in pigs by feeding casein digests in a particular dietary setting (Cartwright et al. 1945). In the light of these findings the 60% case-mortality in our series of cases treated with protein digests is not difficult to understand.

DISCUSSION

It is clear from our findings that the administration of protein hydrolysates to infants with nutritional hypoproteinæmia, &c., fails to raise the plasma proteins, fails to resolve the œdema, and in fact appears to increase the mortality significantly above that observed in patients treated by graded increases in the diet alone. Only occasional cases appear to be capable of utilising these digests of casein. In the majority, the administration of these drugs appeared to aggravate the condition.

In this regard, the observations by Daft and collaborators (1938) are pertinent. These workers reported that "overloading" hypoproteinæmic dogs with plasma resulted in toxic symptoms with the excretion of greater drug. The slide-cell method was used for estimations given in curves 1 and 2, and the petri-dish cover-slip, substituted for the ordinary slide-cell, for the estimations given in curves 3 and 4. The test organism was the Oxford *Staph. aureus.* The following dilutions of serum were used: undiluted serum, the 1 : 2 solution, 1 : 4, and 1 : 8. When bacteriostasis was complete in one dilution and distinctly partial, as compared with the control, in the next highest, it was assumed that bacteriostasis would be complete in a dilution half-way between the two.

---

* Description of these differences is beyond the scope of this note but details will be made available in a monograph on malnutrition now in preparation.

DISCUSSION

The skin reactions to penicillin, however used, externally, intramuscularly, or orally, were limited to the areas initially treated with penicillin—i.e., face, neck, and foot. The rest of the skin remained clear throughout all the investigations and desensitisation treatment, except for the positive patch tests on the back and the intradermal test on the arm. The fact that the face reacted much less after the last test spray on April 9 with the 200-unit solution than after the previous one on March 27 with a solution of the same strength; although the patient had no further desensitisation treatment by the mouth, could perhaps be explained by abolition of the residual sensitivity of the skin of the face by the two sprayings before the last one—i.e., the antepenultimate with the 200 units per c.cm., and the penultimate with the 10 units on April 4.

Our aim in this case was primarily the desensitisation of the allergic patient, yet this record may perhaps contribute a little to the question of absorbability and therapeutic effectiveness of penicillin when given by the mouth, a special research on which work has since been published (Little and Lumb 1945). We searched for but failed to find microscopically any fungi, although the foot lesions led us to suspect antecedent epidermophytosis. We could not obtain trichopytin vaccine to test this possibility. Jadassohn et al. (1937) thought there was a common antigen in all the fungi present besides the specific ones; but Feinberg (1944) found that persons clinically sensitive to penicillin spores did not give a positive skin reaction to the penicillin drug. This was confirmed by Criep (1944), whose patient with penicillin urticaria gave a negative result to a patch test with penicillin extract.

The curves shown in the accompanying figure can probably be explained on the assumption that the antibody and antigen interact to form a compound which is slowly eliminated from the body, a reaction which is reversible, leading to disintegration of this compound. Thus, the difference between curves 1 and 2, showing the penicillin content of the blood-serum in progressive stages of desensitisation three days and nineteen days respectively after the start of desensitisation treatment, can be explained in the following way. In curve 1, the sensitivity being still at its height, antigen-antibody linkage and consequent bacteriostatic neutrality of the compound in the serum are the predominant factors, the reversible reaction, the disintegration of the compound into its constituents, playing in this stage a secondary rôle only. Curve 2 represents the total amount of penicillin coming into circulation after absorption from the intestinal tract as well as from disintegration of the antigen-antibody compound.

Curve 3 represents the free penicillin content of the blood at a later stage, when there was still a very mild skin sensitivity after the treatment with penicillin had stopped 2 weeks previously. This curve shows no free penicillin present in the $^1/_2$-hr. specimen; it had been taken up by the remaining antibody-antigen; but, owing to the great dilution of this compound, and as the antibodies at that stage were less numerous, it immediately underwent disintegration, and the freed penicillin gave, with the penicillin absorbed from the intestines, the conspicuous peak shown in the 1-hr. specimen. This curve is so much above the level of curve 4 given by the control patient that this additional factor—i.e., the freeing of the penicillin adminis an hour previously—must be taken into consideration.

SUMMARY

The case is recorded of a patient who became sen to penicillin in the course of ordinary dermat treatment with penicillin spray.

Anaphylactic shock followed an intramuscular injectio of penicillin.

Oral administration of penicillin brought about com plete desensitisation, abolishing superficial skin hype sensitivity and the shock effects of parenteral penicillin

Actinic sensitivity developed and faded pari passu wit penicillin sensitivity.

An explanation is offered, in terms of antigen-antibod theory, of the differences found in the penicillin conten of the blood during desensitisation and in a control.

A grateful note must be made of the assistance give us in counsel and practice by Colonel M. T. Findlay A.M.S., and Major A. Kirshner, R.A.M.C., pathologist t the hospital.

REFERENCES

Binkley, G. W., Brockmole, A. (1944) *Arch. Derm. Syph., N.Y.* 50, 326.
Criep, L. H. (1944) *J. Amer. med. Ass.* 126, 429.
Feinberg, S. M. (1944) *J. Allergy*, 15, 271.
Jadassohn, W., Schaaf, F., Wohler, G. (1937) *J. Immunol.* 32, 29
Little, C. J. H., Lumb, G. (1945) *Lancet*, i, 203.
Pyle, H. D., Rattner, H. (1944) *J. Amer. med. Ass.* 125, 903.
Silvers, S. H. (1944) *Arch. Derm. Syph., N.Y.* 50, 328.

TREATMENT OF INFANTILE PELLAGRA

ASSESSMENT OF THE VALUE OF PROTEIN HYDROLYSATES

THEODORE GILLMAN
M.B., M.Sc. Witwatersrand

JOSEPH GILLMAN
M.B., D.Sc. Witwatersran

From the Department of Anatomy, Medical School, Universit of the Witwatersrand, Johannesburg

IN previous publications we drew attention to th syndrome of malnutrition in African infants and children In its acute form this expresses itself as a characteristi dermatosis, with varying grades of œdema, hypoprotein æmia, steatorrhœa, or diarrhœa. The case-mortalit can be very high and this is related to the severity of th fatty change in the liver which appears essentially in th early stages of the disease. By carefully selecting com parable cases, on the criterion of the extent of the fatt change in the liver, it became possible, by serial biopsies to assess the value of different forms of therapy on th liver and on the course of the disease (Gillman an Gillman 1945a, b, c, d).

In our hands gastric extract ('Ventriculin,' P.D. Co. has thus far proved to be the most satisfactory form o treatment in this disease in which the case-mortalit may fluctuate between 40% and 60% over a number o years. This finding has since been confirmed by Trowel and Muwazi (1945) on a small series of cases.

The lack of constant supplies of gastric extract made i possible to treat only a limited number of cases at a tim While waiting for further supplies we were constrained t use other forms of therapy. As a consequence, groups of cases were treated intermittently in different ways over a period of three years. Protein hydrolysates only became available to us about nine months ago. The following is a résumé of the various therapeutic measure adopted in 161 infant pellagrins.

All cases received the standard dietaries recommende for infants and children according to their age an weight. Supplements were added as follows:

(*a*) *Vitamins:* Thiamine 60 mg.; nicotinic acid or amid 100 mg.; riboflavine 2 mg.; brewers' yeast 4 g.; 15,00 units vitamin A and 1500 units of vitamin D as fish-liver oil.

(*b*) *Liver extracts:* By mouth, liquid extract of liver (B.D.H By injection, 5 c.cm. crude liver extract (Lilly) intr muscularly twice daily.

(*c*) *Dried stomach:* Ventriculin 5 g. by mouth twice dail for four to six days.

corpora lutea were found. Correlation between the estimated ages of the corpora lutea and the endometria with the dates of operation and menstrual history showed that ovulation took place on the 10th or 11th day and the 6th day of the respective cycles.

CASE 1.—A multipara, aged 49, with menorrhagia. Hysterectomy performed on the 14th day of 26-day cycle; menses 4 days.

Findings.—(1) Hæmorrhagic, well-developed, cytologically normal corpus luteum in the left ovary (1·5 cm. × 1 cm.).

(2) The endometrium presented long tortuous closely packed glands, rather dilated and containing secretion. The columnar-cell nuclei were basal, and the cytoplasm contained secretory granules or vacuoles. Well-marked spiral arterioles were present; and, though the stroma was dense and spindle-celled, it was evident that a developed secretory stage was present (fig. 1).

In this case the corpus luteum was at least 3 or 4 days old, probably older, and ovulation must have taken place at the latest on the 10th or 11th day of the cycle.

CASE 2.—A 4-para, aged 27, with menorrhagia and pain in the right iliac fossa. Curettage and right salpingo-oöphorectomy performed on the 7th day of 28-day cycle; menses 4–5 days, heavy with clots.

Findings.—(1) A recently ruptured graafian follicle or young corpus luteum in the ovary (1·5 cm in diameter). The stigma or point of rupture was still visible. Microscopically, early infolding was present, with an early luteal-cell development from a hyperplastic granulosa-cell layer and theca interna (fig 2).

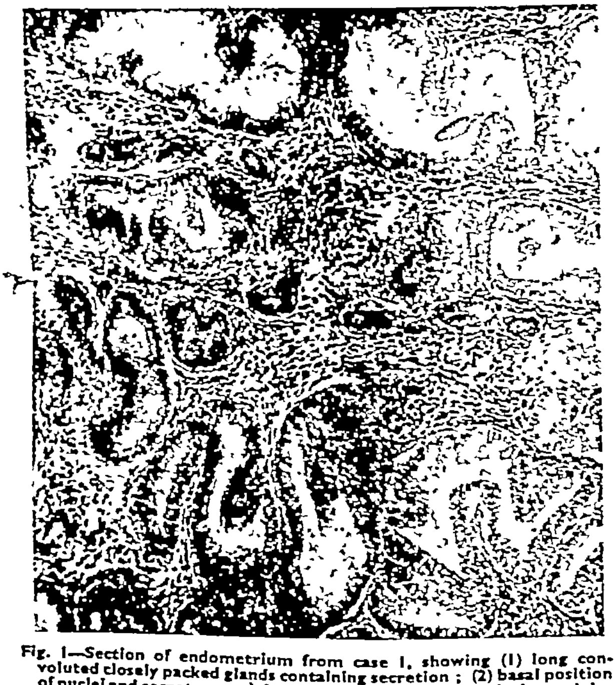


Fig. 1—Section of endometrium from case 1, showing (1) long convoluted closely packed glands containing secretion; (2) basal position of nuclei and secretory activity of cytoplasm; and (3) spiral arterioles in spindle-celled stroma.

(2) The curetting showed straight oval or round glands. Cytologically the nuclei were placed basally, but there was no more than a suspicion of secretory activity in the cytoplasm (fig. 3). The stroma was round-celled and oval-celled, containing developed spiral arterioles.

In this patient, the absence of secretory activity in the endometrium, together with a corpus luteum certainly no older than 24 hours, proves that ovulation took place on the 6th day of the cycle, or 36 hours after cessation of the menstrual flow.

Circumstantial evidence of early ovulation was found in eight other cases. Correlation of the date of biopsy and menstrual history was made with a conservative estimate of the time since the secretory stage was initiated.

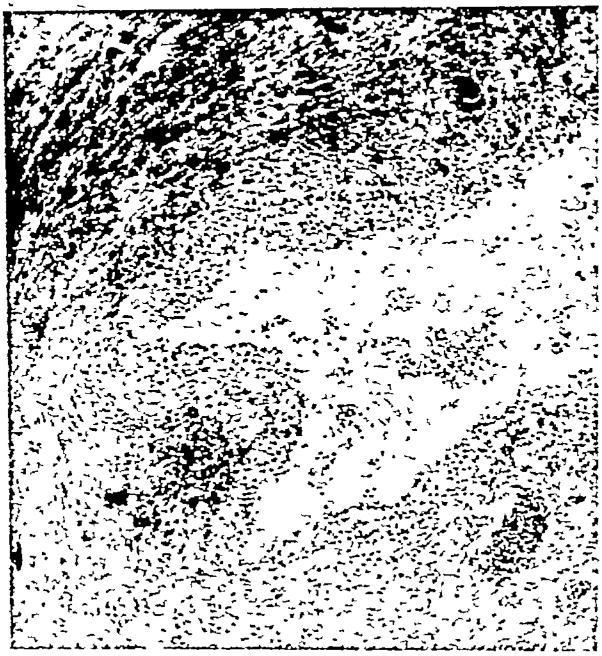


Fig. 2—Section of recently ruptured graafian follicle or very young corpus luteum from case 2.

Even assuming that the endometrial change to secretory activity takes place on the same day as follicular rupture, which is doubtful (see case 2), it seems that the ovulations had taken place between the 3rd and 11th days of the various cycles. The accompanying table shows how the day of ovulation was estimated. The age of the secretory stage was always estimated conservatively; hence the final column in the table is meant to give, not the actual day of ovulation, but the latest day of the cycle on which it could have occurred.

CASE 3.—An unmarried girl, aged 17, with dysmenorrhœa and menorrhagia. Curetted on 9th day of 28-day cycle; menses 6 days.

Findings.—Early secretory, partially dilated and tortuous glands, some of which contained secretion; œdematous round-celled stroma: a few spiral arterioles.

CASE 4.—An unmarried woman, aged 33, with recent hæmorrhage lasting 5 weeks. Curetted on 9th day of present cycle, her usual periodicity being 28 days.

Findings.—Secreting well-dilated tortuous glands, some more differentiated, showing "saw-teeth" appearance and containing secretion; basal nuclei in a columnar epithelium with secretory granules; stroma shows early pseudodecidual change, with numerous well-marked arterioles (fig. 4).

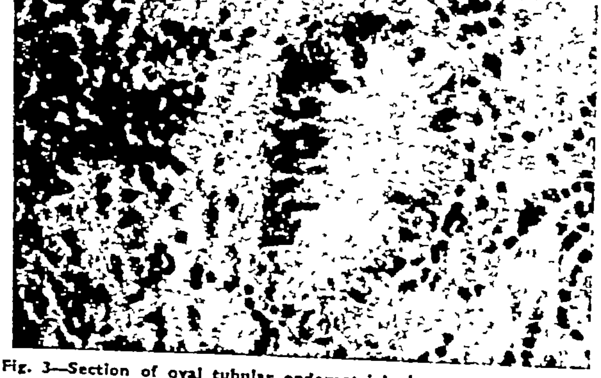


Fig. 3—Section of oval tubular endometrial gland, showing mitotic figures in two cells (from case 2).

quantities of nitrogen than could be accounted for by the amounts of protein in the administered plasma. It appears that "overloading" is a purely relative term. It may well be that our cases were incapable of utilising hydrolysed casein by virtue of the extensive liver damage present, and, more especially, because their metabolic apparatus could not adjust itself sufficiently rapidly to utilise these concentrates. If "overloading" were indeed responsible for the untoward results obtained then it is clear that criteria are needed for determining the dosage of protein hydrolysates to be administered to each case. Until such time as these criteria become available we feel that the administration of protein hydrolysates remains hazardous and is therefore contra-indicated.

Disease represents a particular homœostasis with its own peculiar regulatory mechanism which may have no counterpart in health. If the homœostasis in disease is altered by tampering with any one mechanism without understanding the basic character of the new homœostasis, then, quite clearly, such treatment can be expected to be attended by disaster.

Thus a disease, initiated by malnutrition and showing signs and symptoms regarded as vitamin deficiency, may be aggravated by the administration of vitamins. This is suggested from our results in the table. Similarly, the hypoproteinæmia observed in our cases may be an expression of a new homœostasis emerging in chronic malnutrition; administration of hydrolysates in these circumstances may also prove harmful. Treatment of a single symptom or sign of a disease in which there is widespread disorder of metabolism can often be irrational.

The success of ventriculin, in our opinion, is not due to the addition of a factor the absence of which from the diet originally caused the disease. Ventriculin is apparently able to cause such a radical alteration in the entire homœostasis that the malnourished infant can now take advantage of the essential constituents of a good diet.

SUMMARY

The results obtained with various forms of therapy in 161 cases of infantile pellagra are recorded.

The effectiveness of ventriculin in the treatment of this syndrome has been confirmed in 50 cases.

The addition of vitamin concentrates to ventriculin significantly detracts from its effectiveness as a therapeutic agent.

Vitamin concentrates in combination with liver extracts or ventriculin, or with a full diet, are contra-indicated in the treatment of this form of chronic malnutrition.

Since the administration of protein hydrolysates may result in toxic reactions, and very rarely promotes recovery, we consider this form of therapy hazardous. Until satisfactory criteria are established for determining the dosage in each case, such concentrates, in our opinion, are contra-indicated in the treatment of the acute episodes in the course of chronic malnutrition in African infants.

We wish to acknowledge our indebtedness to the Students Medical Council of the University of the Witwatersrand for a generous grant which made the continuance of this work possible. Thanks are also due to Dr. Wunsh and Dr. Kessel, resident medical officers, and to Sister Spikin for assistance in the wards.

REFERENCES

Cartwright, G. E., Wintrobe, M. M., Buschke, W. H., Follis, R. H., Suksta, A., Humphreys, S. (1945) *J. clin. Invest.* 24, 268.
Currerl, A. R., Hirma, O. V., Cohen, P. P. (1945) *J. Amer. med. Ass.* 128, 732.
Daft, F. S., Robscheit-Robbins, F. S., Whipple, G. H. (1938) *J. biol. Chem.* 123, 87.
Gillman, T., Gillman, J. (1945a) *Nature, Lond.* 155, 634.
— — (1945b) *Arch. intern. Med.* 76, 63.
— — (1945c) *J. Amer. med. Ass.* 129, 12.
— — (1945d) *Arch. Path.* 40, 239.
Madden, S. C., Kattus, A. A., Carter, J. R., Miller, L. L., Whipple, G. H. (1945) *J. exp. Med.* 82, 181.
Trowell, H. C., Muwazi, E. M. K. (1945) *Arch. Dis. Childh.* 20, 170.

EARLY OVULATION

SIMON SEVITT
M.D., M.Sc. Dubl., M.R.C.P.I., D.P.H.

THE theory of ovular menstruation supposes menstruation depends on ovulation and the formation the corpus luteum half-way through the normal menstru cycle of 24–35 days (Schroeder 1928). That menstruatio can take place without a preceding ovulation wa established for the macaque monkey by Corner an Allen (1929), Bartlemez (1933), Sharman (1944), Sevit (1943), Rock (1939), and others. Therefore there ar probably both ovulatory and non-ovulatory menstru cycles.

The question arises whether ovulation, when it take place, always does so between the 14th and the 16th days or can happen at any time during the normal cycle. Teacher (1935), correlating the ages of very young fertilised ova found accidentally at operation or a necropsy with the previous menstrual history, concludes that fertilisation, and therefore presumably ovulation, can take place on any day of the cycle except during menstruation. Evidence that ovulation can take place on any day of the first fortnight of the menstrual cycle, including the last days of menstruation, has been obtained by correlating the menstrual dates and date of operation with the state of the endometrial biopsy material and of the removed ovaries.

The development of the endometrium during the early part of the ovular menstrual cycle is under the influence of the œstrogenic hormones (follicular hormone, œstrin), secreted, at least in part, by the developing graafian follicle. The endometrial changes following ovulation and the formation of the corpus luteum are produced by the luteal hormone, progesterone. These later changes are characteristic histologically, and their finding in a uterine curetting or an endometrial "punch" from the fundus uteri can be taken as strong circumstantial evidence of the presence of a corpus luteum and therefore of a recent ovulation. When the ovaries are also examined and a corpus luteum is found, there can be no doubt that ovulation has taken place.

ESTIMATION OF DAY OF OVULATION

Case	Menstrual periodicity (days)	Duration of menses (days)	Day of biopsy*	Estimated age of secretory stage of endometrium (days)	Day of ovulation*
3	28	6	9	1–3	6–8
4	28	?	9	2–4	5–7
5	28	4–5	13	2–3	10–11
6	21	10	6	2	4
7	21	?	5	1–2	3–4
8	29	7	12	2	10
9	28	6	6	1	5
10	38	?	14	3–4	10–11

* Since start of previous menstruation.

The terminology of the endometrial phases is confused, and in this paper the simple classification of the histologist is used (synonyms in parentheses):

Stage 1: menstruation.
Stage 2: non-secretory, early and late (regenerative, follicular, interval).
Stage 3: secretory, early and late (luteal, progravid, premenstrual, post-ovulatory, differentiative).

In the menstrual and case histories that follow, the days are reckoned from the first day of the previous menstruation.

In these ten cases there is evidence that ovulation took place earlier than the mid-menstrual period. In two (cases 1 and 2) the ovaries were available and

EMPIRICAL TESTS OF LIVER FUNCTION

MONTAGUE MAIZELS *
M.D. Lond., F.R.C.P.
CLINICAL PATHOLOGIST, UNIVERSITY COLLEGE HOSPITAL

APART from tests of specific liver functions, such as the synthesis of hippuric acid, excretion of dyestuffs, &c., certain empirical tests have been devised which all depend mainly on excess of gamma globulin in serum (Kabat et al. 1943), though other minor factors may be concerned, since the various tests do not always give identical results. The object of the tests is threefold: (1) to distinguish between jaundice of parenchymatous origin and that due to obstruction of the bile-ducts; (2) to assist in the diagnosis of hepatitis without jaundice; and (3) to follow the course of toxic liver disease and aid in its prognosis. The present paper attempts to assess the relative value of some of these tests: Britton's (1945) modification of the Takata Ara tests; the cephalin-cholesterol flocculation test (Hanger 1939); the thymol turbidity test (Maclagan 1944); and the colloidal-gold test (Gray 1940).

Opinions about the value of these tests vary. Magath (1940) reports that, though the Takata Ara test was often positive in advanced cirrhosis, it was frequently negative in early cases; and, though many writers report negative findings in jaundice due to duct obstruction, others, including Magath, find a high proportion of positives. Further, it is generally agreed that this test may be positive in many conditions where the liver is not involved, including in one series 27% of mental cases (Ornstein 1937). It is therefore clear that the Takata Ara test fulfils none of the objects set out above, and this appears to be Magath's view.

The cephalin-cholesterol flocculation test is more satisfactory than the Takata Ara, though the reagent varies greatly in sensitivity and probably in composition. Thus, one sample may be unstable with the sera of normals and cases of toxic jaundice, and stable with bile-duct obstruction; another may be stable in normals and unstable in bile-duct obstruction (Pohle and Stewart 1941); and a third preparation may be stable in normals and in duct jaundice and unstable in toxic jaundice, in which case the typical flocculation as described by Hanger (1939) and by Nadler and Butler (1942) are obtained. The latter writers report that fresh cephalin-cholesterol preparations gave numerous false positives, and that typical results were only obtained with aged material. On the other hand, Mateer et al. (1943) found that fresh preparations were alone reliable. This variability constitutes the main drawback of the test, which has been of considerable value in the hands of some workers.

The thymol turbidity test, according to Maclagan (1944), gives a high proportion of positives in toxic hepatitis and is usually negative in obstruction of the bile-ducts. Unlike other tests it also permits of a quantitative assessment of the strength of the reaction and hence of prognosis and progress in cases of hepatitis. According to Maclagan, thymol turbidity roughly parallels the colloidal-gold test but is less likely to be positive in infections and in rheumatoid arthritis. Colloidal gold was not used in the present work but a colloidal suspension of Scharlach red, which is easier to prepare and probably gives similar results. Details of these tests are given in the appendix below. Responses to various tests are shown in tables I and II, together with the albumin-globulin ratios, which were often estimated in parallel.

RESULTS

Normals.—Here cephalin-cholesterol flocculation (C.C.), colloidal Scharlach red (C.R.), and thymol turbidity (T.T.) were almost always negative or at most weakly positive. Maclagan gives the range of T.T. as 0–4 units; in my series 96% of normals were less than 3 units, with one result of 4 and another of 5 units. The Takata Ara test (T.A.) gave so many false positives that according to these data it has no positive value; possibilities of its having a negative value will be considered later.

Parenchymatous Liver Damage.—This has been classified as follows. (1) Catarrhal jaundice, an acute infection sometimes proceeding to subacute hepatitis. (2) Subacute and chronic hepatitis, with little or no fever, but malaise, persistent moderate jaundice, and sometimes ascites; death may result in a few weeks or months, or the condition may proceed to cirrhosis. (3) Cirrhosis, which may obviously follow the preceding, or the stage of active hepatitis may be unobtrusive; cirrhosis then appears to be primary, with gastritis, hæmatemesis, or ascites as its salient features; jaundice, if present, is not severe.

Table I shows that in catarrhal jaundice positive findings are the rule, and the albumin-globulin (A./G.) ratio was less than 1·5 in 11 of 18 cases. In 4 cases there were negative or doubtful findings; these patients were already improving or began to improve during the fortnight which followed the test. In one case alone all

TABLE I—SUMMARY OF FINDINGS WITH EMPIRICAL TESTS IN VARIOUS CONDITIONS

Condition	Test	No. of cases	No. of reactions graded as				
			0	±	+	++	+++
Normals	T.A.	50	34	11	4	1	0
	C.C.	50	45	4	1	0	0
	T.T.	50	49	1	0	0	0
	C.R.	50	49	1	0	0	0
Catarrhal jaundice ..	T.A.	18	0	1	4	3	10
	C.C.	18	4	1	1	2	10
	T.T.	14	5	2	2	2	3
	C.R.	18	4	1	2	3	8
	A./Gd.	18	7	3	5	2	1
Toxic hepatitis (subacute and chronic)	T.A.	11	0	0	0	1	10
	C.C.	11	0	0	1	3	7
	T.T.	11	0	0	3	1	7
	C.R.	11	0	0	1	3	7
	A./Gd.	11	0	1	5	0	5
Cirrhosis ..	T.A.	3	0	0	1	2	0
	C.C.	3	0	0	2	1	0
	T.T.	1	0	0	0	0	1
	C.R.	3	0	0	0	1	2
	A./Gd.	3	0	1	2	0	0
Jaundice due to duct obstruction	T.A.	28	10	3	5	7	3
	C.C.	27	23	1	1	1	1
	T.T.	19	18	1	0	0	0
	C.R.	28	21	1	1	0	5
	A./Gd.	26	16	6	1	3	0
Acholuric family jaundice	T.A.	3	3	0	0	0	0
	C.C.	3	3	0	0	0	0
	T.T.	3	3	0	0	0	0
	C.R.	3	3	0	0	0	0
	A./Gd	3	3	0	0	0	0
Nephritis with blood-urea above 100 mg. per 100 c.cm.	T.A.	3	1	0	0	1	1
	C.C.	3	2	1	0	0	0
	T.T.	3	3	0	0	0	0
	C.R.	3	3	0	0	0	0
	A./Gd.	3	2	1	0	0	0
Nephritis with blood-urea below 100 mg. per 100 c.cm.	T.A.	18	4	0	5	5	4
	C.C.	18	12	1	2	2	1
	T.T.	18	17	1	0	0	0
	C.R.	18	12	0	1	5	0
	A./Gd.	18	10	7	1	0	0
Neoplasms—without jaundice	T.A.	10	7	0	0	1	2
	C.C.	10	10	0	0	0	0
	T.T.	10	10	0	0	0	0
	C.R.	10	8	0	0	2	0
Other conditions not listed above or in table II	T.A.	30	17	4	8	1	0
	C.C.	30	28	1	1	0	0
	T.T.	19	19	0	0	0	0
	C.R.	30	27	1	1	0	1
	A./Gd.	12	10	1	1	0	0

T.A. = Takata Ara; C.C. = cephalin cholesterol, T.T. = thymol turbidity; C.R. = colloidal Scharlach red; A./Gd. = albumin-globulin ratio deficit.
For albumin-globulin ratios, 0 = 1·5 or more; ± = 1·5–1·2; + = 1·2–1·0; ++ = 1·0–0·8; +++ = 0·8 and less. The explanation of the symbols for other tests is given in the appendix.

---

* In receipt of a grant from the Graham Research Fund.

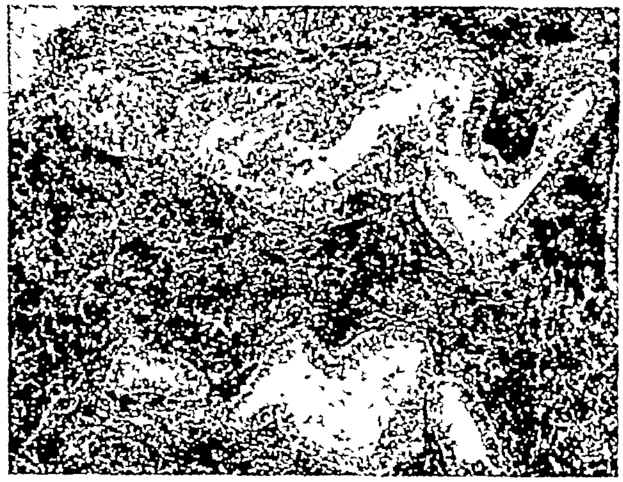


Fig. 4—Section of secreting endometrium, showing convoluted glands containing secretion (from case 4).

CASE 5.—A 3-para, aged 37, with excessive postmenstrual leucorrhœa. Piece from fundus removed on 13th day of 28-day cycle; menses 4–5 days.

Findings.—Glands mostly moderately dilated and somewhat tortuous, with eosinophil granular vacuolated cytoplasm and basal nuclei. Some are smaller and are round straight tubes not secreting. Stroma cells are in an early pseudodeciduous condition; spiral arterioles fairly numerous and well developed.

CASE 6.—A 2-para, aged 28, with menorrhagia and vaginal discharge. Piece from fundus removed on 6th day of 21-day cycle; menses 10 days—i.e., while still bleeding.

Findings.—Most glands convoluted and contain secretion; cytoplasm secreting and nuclei basal—i.e., early secretory stage. Some are non-secreting straight tubes. Stroma very œdematous, and well-developed spiral arterioles seen (fig. 5).

CASE 7.—A 3-para, aged 28, with menorrhagia. Piece from fundus removed on 5th day of 21-day cycle.

Findings.—Most of the glands were moderately dilated, some secreting and others not. Stroma œdematous in superficial layers, but nuclei densely stained and round: some thick-walled blood-vessels present, but most of the spiral arterioles thin-walled and mainly in the spongy layer.

CASE 8.—A primipara, aged 38, with metrorrhagia. Last period, heavy with clots, lasted 7 days. Piece from fundus removed on 12th day; menses started 17 days later.

Findings.—Early secretory endometrium, with moderately dilated and fairly tortuous glands; basally placed nuclei in secretory cytoplasm; stroma round-celled, with much œdema, thick-walled spiral arterioles mainly in deeper layers (fig. 6)

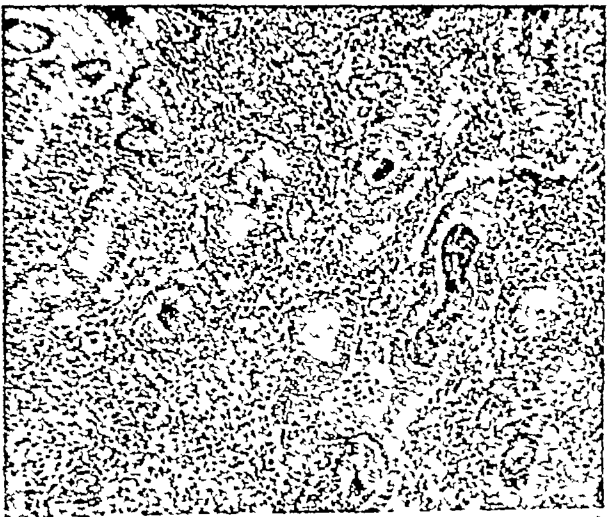


Fig. 5—Section of endometrium from case 6, showing most of the glands in early secretory phase.

CASE 9.—A 2-para, aged 30, with yellow discharge s miscarriage 2½ years ago. Cervical erosion present. Piece fr fundus removed on 6th day of 28-day cycle; menses 5 days—i.e., just ceased.

Findings.—Mostly straight tubular glands, but cytoplas shows the secretory vacuolated change with basal nucl in a columnar epithelium. Some glands rather dilated, othe show early convolution. Stroma presented no luteal effects. This is a very early secretory phase.

CASE 10.—A 4-para, aged 38, with vaginal discharge. Curetted on 14th day of 28-day cycle.

Findings.—Most glands are in the late secretory stage, some, however, are very convoluted but not secreting; stroma round-celled and œdematous; numerous spiral arterioles

DISCUSSION

The ten cases cited were selected from sixty-two case specimens of routine biopsy and operation material for which an accurate menstrual history and clinical details were available. It appears, therefore, that "premature" (or, more correctly, early) ovulation is not uncommon. In two cases ovulation occurred towards the end of the menstrual flow, when one would normally expect to find a reparative non-secretory phase of activity in the endometrium; but, instead, a secretory and therefore presumably luteal stage is seen. In the other cases ovulation took place on various days after cessation of the menstrual flow. It follows that there is no "safe" period in the first half of the menstrual cycle.

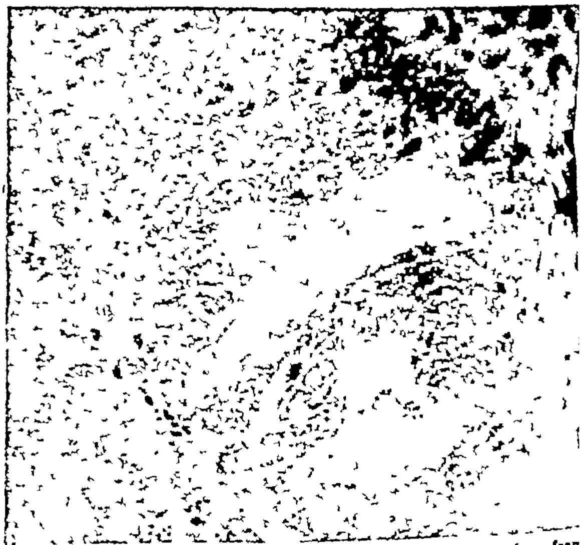


Fig. 6—Section of endometrial gland in early secretory phase from case 8, showing (1) swollen stroma cells and (2) mitoses in gland cells.

SUMMARY

Correlation between the menstrual history and day of operation of ten patients with the findings of a secretory and therefore presumably luteal endometrium during the first fourteen days of the menstrual cycle (and the finding of corpora lutea in two of these cases) supports the belief that ovulation can occur on any day of the first half of the cycle.

My thanks are due to Prof. O'Donel Browne and Dr N. Falkiner for supplying the operation and biopsy specimens; the late Mr. C. Hoppenkopper for preparing the sections; Mr. W. Kampf for the photomicrographs; and Prof. J. T. Wigham for his criticism and advice.

REFERENCES

Bartlemez, G. W. (1933) *Contr. Embryol. Carneg. Instn*, 142, 14.
Corner, G. A., Allen, W. M. (1929) *Amer. J. Physiol.* 87, 326
Rock, J., Bartlett, M. K., Matson, D. D. (1939) *Amer. J. Obstet. Gynec.* 37, 3.
Schroeder, R. (1928) *Ibid*, 16, 135.
Sevitt, S. (1943) *Irish J. med. Sci.* February, p. 40.
Sharman, A. (1944) *J. Obstet. Gynæc.* 51, 85.
Teacher, J. H. (1935) Manual of Obstetrical and Gynæcological Pathology, London.

Sarcoids and Myelomata (table II, cases 8–14).—The liver was large in only 2 of 4 cases of sarcoid, and in no case was there clinical evidence of hepatic deficiency. But empirical tests were always positive and A./G. ratios low. In myelomatosis, on the other hand, though A./G. was still low, empirical tests were negative in 2 cases, whereas T.A. and C.R. were strongly positive in one.

Other Conditions (table I).—These were mainly arterial degeneration and non-malignant intestinal disorders; T.A. is often positive but hardly more so than in normals. Other tests were largely negative. Included in the series are 5 cases of hyperpiesia without nephritis, 1 each of starvation, pulmonary embolus with ascites, Milkman's disease, and polycythæmia vera; all these were negative. An apparent neurotic gave weak positives with T.A., C.C., and C.R. Not included in table I are 3 cases of ulcerative colitis, of which 2 gave negative tests and 1 gave consistently positive tests and had an A./G. ratio of 1/1. There were no cases of cardiac failure in this series, but Maclagan (1944) reports 3 weak positive T.T. and 5 positive colloidal-gold tests in 13 cases. He also reports 6 negatives and 1 weak positive T.T. in 7 cases of amyloidosis. It will thus be seen that there are various conditions in which empirical tests may be positive; the implications of this are considered later.

DISCUSSION

In my hands Britton's (1945) modification of the T.A. proved too sensitive, giving slight or moderate positives in non-hepatic conditions. Other modifications of the T.A. give fewer positives in non-hepatic lesions but are more often negative in frank hepatitis. On the whole, therefore, the T.A. was not considered a satisfactory test. C.R. was negative in about 80% of cases of jaundice due to obstruction of the ducts; C.C. gave 8% of strong and 8% of weak positives; and T.T. gave only 5% of weak positives. The A./G. ratio was usually low in hepatitis; a low ratio in duct obstruction usually indicated severe infection or extensive metastasis; it did not seem to be induced by the remote effect of blockage on liver-cells, even when this was prolonged. It therefore seems that in uncomplicated cases C.C., T.T., C.R., and the A./G. ratio will usually help to distinguish between jaundice of parenchymatous and duct origin. But the coexistence of such complications as cardiac failure, nephritis, rheumatoid arthritis, sarcoidosis, and lymphogranuloma

TABLE II—DETAILS OF EMPIRICAL TESTS ON VARIOUS CASES

Case group	Case	Clinical details	T.A.	C.C.	T.T. (units)	C.R.	A.,G.	E.S.R. (mm. in 1 hr.)
Obstructive jaundice with positive tests	1	Carcinoma of liver comatose	+++	..	..	+++	1·0	..
	2	Carcinoma of liver extensive	+++	0	..	+++	..	..
	3	Carcinoma of liver secondary lung	±	0	0	0	2·2	..
	3a	As 3, but six weeks later	++	++	1	+	1·8	..
	4	Suppurative cholangitis	++	++	3	+++	1·2	..
	5	Cholæmia	+++	++	5	+++	0·7	..
	6	Gall-stones and fever	+	0	8	0	1·5	..
	7	Carcinoma of pancreas	++	0	0	±	1·3	..
Sarcoids	8	Liver large	++	±	..	±	..	..
	9	Liver not large	++	+	..	+++	1·1	..
	10	Liver large, bony rarefactions	+++	++	30	+	1·1	..
	11	..	++	+++	8	++	0·9	..
Multiple myelomatosis	12	Bence-Jones proteinuria	++	0	1	++	0·24	..
	13		0	0	1	0	0·28	..
	14		0	0	1	0	1·4	..
Splenic anæmia	15	*Hippuric-acid synthesis normal*	±	+++	10	+++	1·7	..
	16	Old splenectomy	+++	±	8	±	1·5	..
Macrocytic anæmia	17	Refractory to liver and iron	+++	+	3	±	0·96	..
	18		0	0	1	0	2·0	..
	19		+	0	1	0	2·4	..
	20		0	0	3	0	1·3	..
	21	Refractory large liver, target cells	+++	±	..	±	..	..
	22	Pernicious anæmia	+	0	0	0	1·0	..
	23		+	0	0	0	1·9	..
	24		±	±	7	++	2·0	..
Poisoning	25	Sulphonamide; v.d. Bergh 2 units	+++	++	3	+	1·6	..
	26	? N.A.B. ? toxic jaundice	+++	+++	27	+++	0·9	..
Bacterial infections	27	Pneumonia	+++	+++	9	+++	1·6	30
	28	Pneumonia, interlobar effusion	0	0	1	0	2·1	50
	29	Pneumonia	+	0	2	0	..	..
	30		0	0	0	±	..	35
	31	General peritonitis, high fever	±	0	1	0	..	..
	32	Infective endocarditis, icterus	+++	0	..	++	1·1	..
	33	Gangrene of chest wall	±	0	1	0	1·1	..
	34	Abortus fever	+	0	0	0	..	18
	35	Appendix abscess	+	±	0	0	..	..
	36	Bronchiectasis, urobilinuria	++	0	1	++	..	..
	37	Salpingitis, ulceration of cervix	0	0	4	0	1·8	44
	38	Pyrexia ? cause	+	0	0	0	..	63
	39		*0*	*0*	*1*	*0*	1·7	16
Rheumatoid arthritis	40	..	+++	0	3	+++	..	26
	41	..	+++	0	2	+	..	28
	42	..	±	0	0	0	1·9	50
	43	..	+	±	9	++	1·1	35
	44	..	0	0	3	0	1·2	36
Tuberculosis	45	Phthisis	0	0	..	0	..	..
	46		+	0	2	0	..	..
	47		0	0	0	0	..	20
	48	Phthisis, enteritis	++	0	1	0	0·5	69
	49	Phthisis, empyema	0	0	0	0	..	42
	50	Peritonitis	0	0	0	0	..	20
	51	Knee	++	0	0	0	1·4	10
	52	Spine and cervical glands	++	±	3	0	1·5	36
Disorders of lymph-glands	53	Lymphogranuloma inguinale	++	±	2	0	1·1	..
	54	Sterile inguinal abscess, healed	+++	+++	6	+++	1·1	..
	55	Lymphadenoma	±	0	0	0	1·3	..
	56		±	±	0	0	1·2	51
	57	Lymphatic leukæmia	0	0	1	0	..	..

E.S.R. = Sedimentation of 100 mm. column in 60 minutes.

tests were consistently negative, though jaundice remained intense for nine weeks and then gradually faded. Pain was slight throughout, and the diagnosis remains obscure. On the whole it seems probable that, if signs have not begun to improve within a fortnight of a negative result being obtained, the jaundice is due to gross obstruction. In any case it will be apparent that the tests may sometimes be negative at a time when jaundice is still severe, and, on the other hand, that jaundice may improve while empirical tests remain unaltered or even intensify.

In subacute and chronic hepatitis, well-marked positive findings were invariable, and the A./G. ratio was below 1·2 in 10 of 11 cases. There were only 3 cases of cirrhosis, and C.C., T.T., and C.R. were negative in 2, while the less satisfactory T.A. was positive in all 3. Table I suggests that in parenchymatous jaundice C.C. and C.R. are the most satisfactory tests, with the much simpler T.T. a close runner-up. It is worthy of note that Maclagan (1944) reports 100% of positives for the colloidal-gold and T.T. in 13 cases of cirrhosis, though in a later paper (1945) he reports 2 negative cases. He classifies the parenchymatous group into infectious hepatitis and cirrhosis, and it is possible that a proportion of subacute cases is included with cirrhosis, in which case a high proportion of positives is to be expected. It would be unwise to draw conclusions from 3 cases, but at least the possibility exists that increase of gamma globulin together with the resulting positive empirical tests is associated with the activity of liver damage rather than with its extent.

Jaundice due to Obstruction of Bile-ducts or Hepatic Ducts.—In two-thirds of the cases T.A. was positive; it therefore has no positive value in differential diagnosis. On the other hand, it was positive in all cases of parenchymatous jaundice, and the tentative suggestion is made that a dead negative T.A. by Britton's method (1945) indicates duct obstruction, more especially when the associated jaundice does not clear within a fortnight of the test. With regard to the other tests, positive findings with one or other were recorded in 7 of 28 cases. Of 21 negatives one was a case of suppurative cholangitis; another had been severely jaundiced for eight weeks; while a third had been bronze-green for over a month. It follows that long-standing intense jaundice does not necessarily result in positive findings with C.C., T.T., and C.R. tests. The findings in the 7 positive cases are shown in table II (nos. 1–7). It will be seen that T.T. was low in all, and this suggests that a reading of more than 10 units is strongly against obstruction of the ducts. C.C. was positive in 3 and C.R. in 5 of the tabled cases, and all these had serious complications. Therefore, though negative tests do not exclude serious complications, positive findings suggest that such complications may be present. Of 8 cases of carcinoma of the liver with jaundice, T.A. was positive, and T.T. negative in all. Hence, T.A. is useless in distinguishing between carcinoma and hepatitis, whereas a positive T.T. makes carcinoma of the liver unlikely, and a negative T.T. indicates that hepatitis is probably absent. C.R. was positive in 4 cases, 2 being primary growths of the liver and 2 secondary; C.C. was positive in only 2 cases, both secondary.

The findings of other observers in cases of duct obstruction vary. Hanger (1939) finds that C.C. is negative or at most weakly positive in all cases. Nadler and Butler (1942), using an aged reagent, had 20 negatives and 7 weak positives, whereas Mateer et al. (1943) found that they could only rely on a relatively insensitive unripened preparation, and that even so half their cases of gallstones gave positive findings. So, too, Pohle and Stewart (1941) found, in 23 cases, 5 weak, 9 moderate, and 4 strong positives. With regard to T.T. and colloidal gold, Maclagan (1944) found only 3 slight positives. Once again it will be seen that Maclagan's simple test, though not infallible, is least likely to mislead in the differential diagnosis of jaundice. Hanger (1939) reports low A./G. ratios (less than 1·5) in 7 of 17 cases of duct obstruction; in the present series low ratios occurred in 10 of 26 cases.

In acholuric familial jaundice all tests were negative, and it seems clear that empirical tests will help to distinguish between hepatitis and other conditions causing jaundice, assuming that the obstructive jaundice is not associated with some independent disease which gives positive findings.

Nephritis.—It is clear from table I that T.A. gives many positives; C.R. was less affected, and very strong reactions, in contrast with what occurs in hepatitis, are not found. C.C. gave fewer positives than C.R., and T.T. again proved most satisfactory, giving only 1 weak positive in 20 cases. The results of the tests were not correlated with the A./G. ratio or blood-urea level.

Neoplasms without Jaundice.—These were mostly negative; 2 cases with metastases in the liver were positive with T.A. and C.R., and negative with T.T. and C.C. (table I).

Anæmias.—Five severe cases of microcytic anæmia were all negative. Most of the macrocytic anæmias gave positive T.A. tests, but only 3 gave positives with C.R. and C.C., and the reactions were weak. In these 3 cases macrocytosis was associated with hepatomegaly in one, with nocturnal hæmoglobinuria in another, and with an increase in the marrow plasma-cells (8%) in the third, and liver damage may well have existed in all (table II, cases 17–24). T.T. was negative in 7 cases, and weakly positive in 1 case. Maclagan (1944) reports 3 weak positive T.T.s, and 6 moderate or strong colloidal gold tests in 8 cases of pernicious anæmia.

Splenic Anæmia.—One case had normal hippuric-acid excretion; a second patient had undergone splenectomy, which had much decreased the incidence of hæmatemesis. Both cases gave positives with all four tests (table II, cases 15 and 16).

Poisons.—A case of early carcinoma of the parotid poisoned with sulphonamides (table II, case 25) had agranulocytosis and slight hæmolytic jaundice; except for T.T., all the tests were positive, and perhaps this case should have been included in the toxic-jaundice group; the same is probably true of case 26 receiving arsenicals for syphilis. In still another case receiving arsenicals, severe anæmia and agranulocytosis were present and the empirical tests were all negative.

Bacterial Infections.—Of 13 cases, 9 were positive to T.A., 2 to C.C., and 4 to C.R.; 1 was rather weakly positive to T.T. Maclagan (1944) gives 8 positive colloidal-gold tests in 12 cases, and 4 weak positive T.T.s in 8 cases. In table II cases 27–39 show that there is no correlation between empirical tests, A./G. ratio, and sedimentation-rate.

Rheumatoid Arthritis.—This group is interesting because of the frequency of positive findings recorded by Maclagan (1944). In the present series (table II, cases 40–44) T.A. was positive in 4, C.C. in 1, C.R. in 3, and T.T. weakly positive in 1 of 5 cases. Here too there was no correlation between these tests, A./G. ratio, and sedimentation-rate.

Tuberculosis.—Apart from the T.A., other tests were negative in this assorted group. In case 48 A./G. was very low, and the sedimentation-rate very high, but C.C., T.T., and C.R. were negative (table II, cases 52–57).

Lymph-gland Involvement (table II, cases 52–57).—Apart from T.A., empirical tests were negative or weakly positive in various conditions, including Hodgkin's disease and lymphogranuloma inguinale. Case 54, probably lymphogranuloma inguinale, gave positive tests. There were no cases of infectious mononucleosis in my series, but Maclagan (1944) reports 3 strong positive T.T. and colloidal-gold tests in 4 cases. It is interesting to note the frequency of low A./G. ratios in these glandular cases, due to increased globulin rather than to low albumin.

Sarcoids and Myelomata (table II, cases 8–14).—The liver was large in only 2 of 4 cases of sarcoid, and in no case was there clinical evidence of hepatic deficiency. But empirical tests were always positive and A./G. ratios low. In myelomatosis, on the other hand, though A./G. was still low, empirical tests were negative in 2 cases, whereas T.A. and C.R. were strongly positive in one.

Other Conditions (table I).—These were mainly arterial degeneration and non-malignant intestinal disorders; T.A. is often positive but hardly more so than in normals. Other tests were largely negative. Included in the series are 5 cases of hyperpiesia without nephritis, 1 each of starvation, pulmonary embolus with ascites, Milkman's disease, and polycythæmia vera; all these were negative. An apparent neurotic gave weak positives with T.A., C.C., and C.R. Not included in table I are 3 cases of ulcerative colitis, of which 2 gave negative tests and 1 gave consistently positive tests and had an A./G. ratio of 1/1. There were no cases of cardiac failure in this series, but Maclagan (1944) reports 3 weak positive T.T. and 5 positive colloidal-gold tests in 13 cases. He also reports 6 negatives and 1 weak positive T.T. in 7 cases of amyloidosis. It will thus be seen that there are various conditions in which empirical tests may be positive: the implications of this are considered later.

DISCUSSION

In my hands Britton's (1945) modification of the T.A. proved too sensitive, giving slight or moderate positives in non-hepatic conditions. Other modifications of the T.A. give fewer positives in non-hepatic lesions but are more often negative in frank hepatitis. On the whole, therefore, the T.A. was not considered a satisfactory test. C.R. was negative in about 80% of cases of jaundice due to obstruction of the ducts; C.C. gave 8% of strong and 8% of weak positives; and T.T. gave only 5% of weak positives. The A./G. ratio was usually low in hepatitis; a low ratio in duct obstruction usually indicated severe infection or extensive metastasis; it did not seem to be induced by the remote effect of blockage on liver-cells, even when this was prolonged. It therefore seems that in uncomplicated cases C.C., T.T., C.R., and the A./G. ratio will usually help to distinguish between jaundice of parenchymatous and duct origin. But the coexistence of such complications as *cardiac failure, nephritis*, rheumatoid arthritis, sarcoidosis, and lymphogranuloma

TABLE II—DETAILS OF EMPIRICAL TESTS ON VARIOUS CASES

Case group	Case	Clinical details	T.A.	C.C.	T.T. (units)	C.R.	A./G.	E.S.R. (mm. in 1 hr.)
Obstructive jaundice with positive tests	1	Carcinoma of liver comatose	+++	..	..	+++	1·0	..
	2	extensive	+++	0	..	+++	..	..
	3	secondary lung	±	0	0	0	2·2	..
	3a	As 3, but six weeks later	++	++	1	+	1·8	..
	4	Suppurative cholangitis	++	++	3	+++	1·2	..
	5	Cholæmia	+++	++	5	+++	0·7	..
	6	Gall-stones and fever	+	0	8	0	1·5	..
	7	Carcinoma of pancreas	++	0	0	±	1·3	..
Sarcoids	8	Liver large	++	±	..	±	..	..
	9	Liver not large	++	+	..	+++	1·1	..
	10	Liver large, bony rarefactions	+++	++	30	+	1·1	..
	11	..	++	+++	8	++	0·9	..
Multiple myelomatosis	12	Bence-Jones proteinuria	++	0	1	++	0·24	..
	13		0	0	1	0	0·28	..
	14		0	0	1	0	1·4	..
Splenic anæmia	15	Hippuric-acid synthesis normal	±	+++	10	+++	1·7	..
	16	Old splenectomy	+++	±	8	±	1·5	..
Macrocytic anæmia	17	Refractory to liver and iron	+++	+	3	±	0·96	..
	18		0	0	1	0	2·0	..
	19		+	0	1	0	2·4	..
	20		0	0	3	0	1·3	..
	21	Refractory large liver, target cells	+++	±	..	±	..	..
	22	Pernicious anæmia	+	0	0	0	1·0	..
	23		+	0	0	0	1·9	..
	24		±	±	7	++	2·0	..
Poisoning	25	Sulphonamide; v.d. Bergh 2 units	+++	++	3	+	1·6	..
	26	? N.A.B. ? toxic jaundice	+++	+++	27	+++	0·9	..
Bacterial infections	27	Pneumonia	+++	+++	9	+++	1·6	30
	28	Pneumonia, interlobar effusion	0	0	1	0	2·1	50
	29	Pneumonia	+	0	2	0	..	..
	30		0	0	0	±	..	35
	31	General peritonitis, high fever	±	0	1	0	..	..
	32	Infective endocarditis, icterus	+++	0	..	++	1·1	..
	33	Gangrene of chest wall	±	0	1	0	1·1	..
	34	Abortus fever	+	0	0	0	..	18
	35	Appendix abscess	+	±	0	0	..	..
	36	Bronchiectasis, urobilinuria	++	0	1	++	..	..
	37	Salpingitis, ulceration of cervix	0	0	4	0	1·8	44
	38	Pyrexia ? cause	+	0	0	0	..	63
	39		0	0	1	0	1·7	16
Rheumatoid arthritis	40	..	+++	0	3	+++	..	26
	41	..	+++	0	2	+	..	28
	42	..	±	0	0	0	1·9	50
	43	..	+	±	0	++	1·1	35
	44	..	0	0	3	0	1·2	30
Tuberculosis	45	Phthisis	0	0	..	0	..	..
	46		+	0	2	0	..	..
	47		0	0	0	0	..	20
	48	Phthisis, enteritis	++	0	1	0	0·5	69
	49	Phthisis, empyema	0	0	0	0	..	42
	50	Peritonitis	0	0	0	0	..	20
	51	Knee	++	0	0	0	1·4	10
	52	Spine and cervical glands	++	±	3	0	1·5	36
Disorders of lymph-glands	53	Lymphogranuloma inguinale	++	±	2	0	1·1	..
	54	Sterile inguinal abscess, healed	+++	+++	6	+++	1·1	..
	55	Lymphadenoma	±	0	0	0	1·3	..
	56		±	±	0	0	1·2	51
	57	Lymphatic leukæmia	0	0	1	0	..	..

E.S.R. = Sedimentation of 100 mm. column in 60 minutes.

tests were consistently negative, though jaundice remained intense for nine weeks and then gradually faded. Pain was slight throughout, and the diagnosis remains obscure. On the whole it seems probable that, if signs have not begun to improve within a fortnight of a negative result being obtained, the jaundice is due to gross obstruction. In any case it will be apparent that the tests may sometimes be negative at a time when jaundice is still severe, and, on the other hand, that jaundice may improve while empirical tests remain unaltered or even intensify.

In subacute and chronic hepatitis, well-marked positive findings were invariable, and the A./G. ratio was below 1·2 in 10 of 11 cases. There were only 3 cases of cirrhosis, and C.C., T.T., and C.R. were negative in 2, while the less satisfactory T.A. was positive in all 3. Table I suggests that in parenchymatous jaundice C.C. and C.R. are the most satisfactory tests, with the much simpler T.T. a close runner-up. It is worthy of note that Maclagan (1944) reports 100% of positives for the colloidal-gold and T.T. in 13 cases of cirrhosis, though in a later paper (1945) he reports 2 negative cases. He classifies the parenchymatous group into infectious hepatitis and cirrhosis, and it is possible that a proportion of subacute cases is included with cirrhosis, in which case a high proportion of positives is to be expected. It would be unwise to draw conclusions from 3 cases, but at least the possibility exists that increase of gamma globulin together with the resulting positive empirical tests is associated with the activity of liver damage rather than with its extent.

Jaundice due to Obstruction of Bile-ducts or Hepatic Ducts.—In two-thirds of the cases T.A. was positive; it therefore has no positive value in differential diagnosis. On the other hand, it was positive in all cases of parenchymatous jaundice, and the tentative suggestion is made that a dead negative T.A. by Britton's method (1945) indicates duct obstruction, more especially when the associated jaundice does not clear within a fortnight of the test. With regard to the other tests, positive findings with one or other were recorded in 7 of 28 cases. Of 21 negatives one was a case of suppurative cholangitis; another had been severely jaundiced for eight weeks; while a third had been bronze-green for over a month. It follows that long-standing intense jaundice does not necessarily result in positive findings with C.C., T.T., and C.R. tests. The findings in the 7 positive cases are shown in table II (nos. 1–7). It will be seen that T.T. was low in all, and this suggests that a reading of more than 10 units is strongly against obstruction of the ducts. C.C. was positive in 3 and C.R. in 5 of the tabled cases, and all these had serious complications. Therefore, though negative tests do not exclude serious complications, positive findings suggest that such complications may be present. Of 8 cases of carcinoma of the liver with jaundice, T.A. was positive, and T.T. negative in all. Hence, T.A. is useless in distinguishing between carcinoma and hepatitis, whereas a positive T.T. makes carcinoma of the liver unlikely, and a negative T.T. indicates that hepatitis is probably absent. C.R. was positive in 4 cases, 2 being primary growths of the liver and 2 secondary; C.C. was positive in only 2 cases, both secondary.

The findings of other observers in cases of duct obstruction vary. Hanger (1939) finds that C.C. is negative or at most weakly positive in all cases. Nadler and Butler (1942), using an aged reagent, had 20 negatives and 7 weak positives, whereas Mateer et al. (1943) found that they could only rely on a relatively insensitive unripened preparation, and that even so half their cases of gallstones gave positive findings. So, too, Pohle and Stewart (1941) found, in 23 cases, 5 weak, 9 moderate, and 4 strong positives. With regard to T.T. and colloidal gold, Maclagan (1944) found only 3 slight positives. Once again it will be seen that Maclagan's simple test, though not infallible, is least likely to mislead in the differential diagnosis of jaundice. Hanger (1939) reports low A./G. ratios (less than 1·5) in 7 of 17 cases of duct obstruction; in the present series low ratios occurred in 10 of 26 cases.

In acholuric familial jaundice all tests were negative, and it seems clear that empirical tests will help to distinguish between hepatitis and other conditions causing jaundice, assuming that the obstructive jaundice is not associated with some independent disease which gives positive findings.

Nephritis.—It is clear from table I that T.A. gives many positives; C.R. was less affected, and very strong reactions, in contrast with what occurs in hepatitis, are not found. C.C. gave fewer positives than C.R., and T.T. again proved most satisfactory, giving only 1 weak positive in 20 cases. The results of the tests were not correlated with the A./G. ratio or blood-urea level.

Neoplasms without Jaundice.—These were mostly negative; 2 cases with metastases in the liver were positive with T.A. and C.R., and negative with T.T. and C.C. (table I).

Anæmias.—Five severe cases of microcytic anæmia were all negative. Most of the macrocytic anæmias gave positive T.A. tests, but only 3 gave positives with C.R. and C.C., and the reactions were weak. In these 3 cases macrocytosis was associated with hepatomegaly in one, with nocturnal hæmoglobinuria in another, and with an increase in the marrow plasma-cells (8%) in the third, and liver damage may well have existed in all (table II, cases 17–24). T.T. was negative in 7 cases, and weakly positive in 1 case. Maclagan (1944) reports 3 weak positive T.T.s, and 6 moderate or strong colloidal-gold tests in 8 cases of pernicious anæmia.

Splenic Anæmia.—One case had normal hippuric-acid excretion; a second patient had undergone splenectomy, which had much decreased the incidence of hæmatemesis. Both cases gave positives with all four tests (table II, cases 15 and 16).

Poisons.—A case of early carcinoma of the parotid poisoned with sulphonamides (table II, case 25) had agranulocytosis and slight hæmolytic jaundice; except for T.T., all the tests were positive, and perhaps this case should have been included in the toxic-jaundice group; the same is probably true of case 26 receiving arsenicals for syphilis. In still another case receiving arsenicals, severe anæmia and agranulocytosis were present and the empirical tests were all negative.

Bacterial Infections.—Of 13 cases, 9 were positive to T.A., 2 to C.C., and 4 to C.R.; 1 was rather weakly positive to T.T. Maclagan (1944) gives 8 positive colloidal-gold tests in 12 cases, and 4 weak positive T.T.s in 8 cases. In table II cases 27–39 show that there is no correlation between empirical tests, A./G. ratio, and sedimentation-rate.

Rheumatoid Arthritis.—This group is interesting because of the frequency of positive findings recorded by Maclagan (1944). In the present series (table II, cases 40–44) T.A. was positive in 4, C.C. in 1, C.R. in 3, and T.T. weakly positive in 1 of 5 cases. Here too there was no correlation between these tests, A./G. ratio, and sedimentation-rate.

Tuberculosis.—Apart from the T.A., other tests were negative in this assorted group. In case 48 A./G. was very low, and the sedimentation-rate very high, but C.C., T.T., and C.R. were negative (table II, cases 52–57).

Lymph-gland Involvement (table II, cases 52–57).—Apart from T.A., empirical tests were negative or weakly positive in various conditions, including Hodgkin's disease and lymphogranuloma inguinale. Case 54, probably lymphogranuloma inguinale, gave positive tests. There were no cases of infectious mononucleosis in my series, but Maclagan (1944) reports 3 strong positive T.T. and colloidal-gold tests in 4 cases. It is interesting to note the frequency of low A./G. ratios in these glandular cases, due to increased globulin rather than to low albumin.

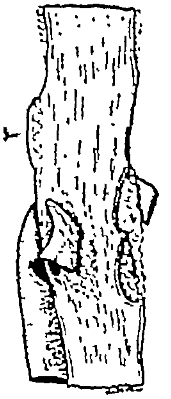
PERFORATION OF THE AORTA
BY SWALLOWED BONES

MAGNUS HAINES
M.D. Lond.
ASSISTANT PATHOLOGIST, WESTMINSTER HOSPITAL

THE anatomical relations and infective contents of the œsophagus make its perforation often fatal. Most of the cases, resulting from malignant ulceration, terminate with mediastinitis. However, when a foreign body becomes impacted in the œsophagus, usually at or just below the tracheal bifurcation, there are three possible sequelæ: (1) ulceration of the œsophagus, leading later to a cicatricial stricture; (2) perforation of the œsophagus, with subsequent mediastinitis and/or pyopneumothorax; and (3) perforation of the œsophagus and the aortic arch. The second of these sequelæ may precede the third. The history and post-mortem findings of two recent cases are reported here.

CASE-RECORDS

CASE 1.—A well-built man, aged 22, on leave from the Army, complained, after taking a mouthful of chicken on Dec. 27, that something had stuck in his throat. He ate no further dinner, and about 4 P.M. the same day sought advice at his local hospital. The pharynx and larynx showed no trace of a foreign body, and at the doctor's suggestion he swallowed a crust of bread without apparent difficulty. Four hours later he reported again at the same hospital, complaining of pain in the chest and of difficulty in breathing. Further examination revealed no abnormal physical signs, and the doctor advised him to return again in the morning if he felt no better. He lay in bed all next day (Dec. 28). Pain in the midline of the back, localised to a small area over the sixth thoracic vertebra, was first noted on this day, and he was "unable to swallow anything."


Sketch showing perforation of aorta by chicken bone (case 1). Œsophagus has been opened from behind.

He returned to duty on the 29th and "went sick." He was admitted to hospital that evening, when radiography of his chest showed no abnormal shadow. Next day, his temperature being 100° F, he was œsophagoscoped. After passing 23 cm. the instrument came upon an œdematous swelling. No foreign body was located, but it was considered unwise to attempt passing the instrument further, even if possible. A small hæmatoma was encountered 2 cm. proximal to the area of œdema.

A small hæmatemesis took place on Jan. 2, and a further 6 oz. of bright red blood was vomited at 12.30 A.M. on the 3rd. Three hours later the patient said he was going to be sick and tried to sit up, but fell back. The face blanched, severe air-hunger set in, and he died within 5 minutes.

At *necropsy* I found an irregular quadrilateral plate of chicken bone, whose sides measured approximately 2, 2, 3, and 3 cm., firmly lodged in the œsophagus, just below the bifurcation of the trachea (see figure). The anterior wall of the œsophagus was deeply congested and swollen. One angular corner of the bone had made a rent 1·5 cm. long in the anterior wall, but there was only slight inflammation in the circumœsophageal tissues at this point. Another sharper corner of the bone had pierced both the left posterolateral wall of the œsophagus and the contiguous aorta at the beginning of its descending portion. The tear in it was 8 mm. long, and there was almost no inflammation in the region. Clotted and fluid blood was found in the stomach and intestine. Apart from exsanguination, other organs presented no abnormal features.

CASE 2.—A housewife, aged 46, came to the hospital complaining that she had just swallowed a fish bone. Laryngoscopy and pharyngoscopy showed no foreign body. Radiography of a barium-cotton-wool swallow was negative. Two days later she was examined by the throat specialist, as the pain in the chest and back persisted. Again no foreign body was seen in the pharynx or larynx, and radiography again showed nothing abnormal.

Six days after swallowing the bone she vomited, for the first time, about half a pint of bright red partially clotted blood. She then fainted and was found on the floor in a collapsed state. On admission to hospital about two hours after the hæmatemesis she was pale and sweating. Examination by indirect laryngoscopy showed no foreign body. During the evening, and on four subsequent occasions during the next two days, she vomited more blood. On the day after admission œsophagoscopy was performed, but no foreign body or ulceration was discovered. After a final hæmorrhage (about 20 oz. vomited) she died next evening.

At *necropsy* a small area of œdema and congestion was found in the external aspect of the posterior wall of the œsophagus extending upwards from the level of the tracheal bifurcation. The mediastinal tissues immediately related to the under surface of the bifurcation and along the right bronchus showed early gangrene. Infection had tracked down interstitially from above. On opening the œsophagus from behind there was seen a recent oval ulcer ½ in. long and ¼ in. across, involving the entire thickness of the anterior wall of the œsophagus. It was about 4 in. below the level of the cricoid cartilage, though above the tracheal bifurcation. The ulcer communicated directly with the adjacent aorta, which had a tear in its wall ¼ in. long and situated just below the origin of the left subclavian artery. No foreign body could be found in the œsophagus, lungs, or mediastinum. A prolonged search was also made in the main branches of the aorta without finding any foreign body. Blood was found adhering to the ulcer and in the œsophagus. The rest of the alimentary tract contained large quantities of blood, both fresh and altered.

DISCUSSION

Several fatal cases have been reported, including those by Grey Turner (1910), Watson-Williams (1937), and Decoulx and Omez (1939). Many records can also be found of successful removal of a foreign body, in earlier years by œsophagotomy and nowadays by œsophagoscope. In the fatal cases the minute size of the foreign bodies, the length of time elapsing between the accident and the patients' coming under medical supervision, and the failure of radiography to demonstrate the foreign body seem to be important considerations. Grey Turner and Watson-Williams each report a case in which the bone was not found at the autopsy. In my case 1 radiography did not reveal the bone, and in case 2 the bone was never found. The time factor is very variable; commonly there is a 4–10 days' interval between the accident and a fatal aortic perforation. In Grey Turner's case the interval was 22 months.

The characteristic sign of injury to the aorta has been vomiting of blood, which occurs at short intervals but in increasing quantities until the final hæmorrhage. Watson-Williams believes that a prick perforation of the œsophagus leads to infection and necrosis of the arterial wall, and rupture finally ensues from intra-aortic pressure. This was a possible mechanism in one of his cases, where the fatal hæmorrhage closely followed the removal of the bone through the œsophagoscope. In my case 1 it seems that, owing to the size and sharp angle of the bone, pressure from the pulsating aorta aided penetration. There was no macroscopic inflammation in relation to this perforation. Even if the bone had been seen through the œsophagoscope on Dec. 30, the chances of removing it were almost nil. In case 2 it is considered that the bone may have been vomited or swallowed at any time after the aorta had been injured.

Decoulx and Omez report a very unusual case whose course was aggravated by a second accident. A miner, aged 37, continued at his work after swallowing a chicken bone. Ten days had gone by when, at work, he received a crush injury of the chest, which was followed by vomiting of blood. He died two days later from further hæmatemeses.

Diagnosis, without immediate endoscopy, presents many difficulties in these cases. In some, radiography will localise an opaque foreign body, but many foreign bodies are not dense enough to be visible—e.g., fish bones. That a patient with a fairly large object impacted in the inguinale might give confusing results. The complicating malady, however, is not likely to cause much difficulty since clinically it will be fairly evident. But this is not the case when jaundice due to duct obstruction is complicated by cholecystitis, subphrenic abscess, empyema, or poisoning by sulphonamides used in the treatment of infection. In all these conditions T.A., C.C., and C.R. may be strongly positive, though the high figures for T.T. encountered in hepatitis (10 units or more) are not likely to be met. There are no cases of hepatitis without jaundice in the present series, but other data suggest that empirical tests could not do more than lend support to a clinical diagnosis.

As regards choice of tests, in so far as T.T. is much easier than the others it is to be preferred, and it gives a simple and quick pointer to the nature of obscure jaundice and a quantitative measure of the degree and change of liver-cell damage. There seems to be no special advantage in using C.R., nor presumably in colloidal gold, though both are superior to T.A. The difficulty with the C.C. test lies in the preparation of a reagent of the right sensitivity. When this can be obtained, the test is probably superior to T.T., but in my experience two of three reagents prepared were too sensitive and rather unsatisfactory.

With regard to the origin of the empirical tests, cataphoretic studies (Kabat et al. 1943) show that these depend on increased gamma globulin. The cause of this increase is less clear. According to Gray and Barron (1943) the inability of the liver to form enough albumin is compensated by increased production of beta and gamma globulin or, if these fail, alpha globulin. It is, however, difficult to understand how, when albumin formation fails, the liver succeeds in producing greatly increased quantities of globulin. On the other hand, Bing (1940) has shown that hyperglobulinæmia occurs in many different bacterial, virus, and protozoal infections which all have in common much reticulo-endothelial or plasma-cell reaction. Another possible source of gamma globulin is the lymphocyte (Kass 1945).

In the present series increase of serum-globulin above the normal maximum of 3 g. per 100 c.cm. was observed in several instances, including 2 cases of rheumatoid arthritis with serum-globulins of 3·37 and 3·1; two cases of sarcoidosis with globulins of 4·22 and 3·96; 2 cases of Hodgkin's disease with globulins of 3·0 and 3·53; and 2 cases of lymphogranuloma with serum-globulins of 3·39 and 3·17 g. per 100 c.cm. In none of these cases was there evidence of liver involvement, and it seems likely that the site of globulin formation was elsewhere. This observation also applies to 2 cases of multiple myelomatosis (in one, albumin was 2·29 g. and globulin 8·36 g. per 100 c.cm.; in a second, albumin was 2·38 g. and globulin 9·92 g. per 100 c.cm.). In both, the figures suggest that albumin was reduced to a very low level to compensate for the excessive production of globulin. In 4 cases of hepatitis the A./G. ratios were 2·04/5·11, 3·46/4·34, 4·41/4·41, and 3·67/6·30. Here also it is perhaps possible that part at least of the increase in globulin is derived from an extrahepatic source and may compensate for deficient production of serum-albumin by the liver. If this compensation was osmotic, then, owing to its larger molecule, a relatively larger amount of globulin would be needed to compensate for the absence of a given weight of albumin. In these circumstances the total protein of a globulin-compensated serum would be greater than that of normal serum, a finding which is common in hepatitis and is illustrated in the 4 cases mentioned above, where the total serum-protein was 7·15, 7·80, 8·82, and 9·97 g. per 100 c.cm.

SUMMARY

The rating of several empirical liver tests in order of usefulness in the differential diagnosis of jaundice was: thymol turbidity, cephalin-cholesterol flocculation, colloidal Scharlach red (or colloidal gold), and Takata Ara.

If a case diagnosed as toxic jaundice gives negative empirical tests, it will probably begin to clear within a fortnight. Failure so to improve, with persistence of negative tests, suggests that the diagnosis is probably incorrect.

In obstruction of the hepatic ducts or bile-ducts the colloidal red is negative in 80% of cases and the cephalin-cholesterol flocculation in about 90%, whereas thymol turbidity rarely exceeds 10 units, even when the jaundice is long-standing and severe. When cases of duct obstruction give positive empirical tests, serious complications, such as metastases and infection, are commonly present, though extensive liver metastases may accompany negative tests.

Besides hepatitis, positive empirical tests may also be given by myelomatosis, sarcoidosis, certain types of adenitis, rheumatoid arthritis, sulphonamide poisoning, and infections with certain bacteria, protozoa, and viruses. If any of these maladies accompany simple duct obstruction, the positive tests may suggest that parenchymatous damage is present.

APPENDIX ON METHODS

Blood was collected in the morning, kept for three hours at 37° C, and then at room temperature. In the afternoon, serum was separated without hæmolysis, and the tests were put up immediately.

Takata Ara modified by Britton (1945).—Readings are as follows:

O = no change in any tube, or a cloud in tube 3, with or without a fine amorphous precipitate.
± = small gelatinous precipitate in tube 3 only.
+ = moderate or bulky precipitate in tube 3 only.
+ + = heavy flocculent precipitate in tube 3; some precipitation in tube 2.
+ + + = heavy precipitate in tubes 2 and 3. (Though exceptionally strong reactions sometimes occurred with precipitation in tube 1, no special record was made of these.)

Cephalin-cholesterol Flocculation (Hanger 1939).—Recorded as follows at 24 hours:

O = no change.
± = fine granularity without precipitation.
+ = granularity with some precipitation.
+ + = granularity with heavy precipitation.
+ + + = complete precipitation with clear supernatant fluid.

Thymol Turbidity (Maclagan 1944).—Recorded in table I as follows:

O = 0–4 arbitrary units.
± = 4–8 units.
+ = 8–12 units.
+ + = 12–20 units.
+ + + = 20–40 units.

Colloidal Scharlach Red.—A saturated solution of the dye in alcohol is kept at 37° C; 10 ml. of this in a clean conical flask and 50 ml. water in a second flask are warmed to about 55° C and the water quickly added to the dye solution. The mixture is then boiled first in the bath and then over gauze till the final volume is about 20 ml. The volume is then made up to 75 ml. and 0.35 ml. Evans blue (0·2%) is added. For use, 0·5 ml. of the reagent is added to 0·5 ml. of serum diluted to 1/2, 1/4, and 1/8 with saline (0·85%). Results are read next day. If the serum is icteric, an identical control series may be put up at the time of reading to facilitate identification of colour changes. In the case of sera, readings are as follows:

	Non-icteric sera		*Icteric sera*
O	= purple or violet	=	orange or dirty green.
±	= blue tinged with violet in 1 tube only	=	dirty green in 1 tube only
+	= sky blue in 1 tube only	=	bottle-green in 1 tube only
+ +	= „ „ 2 tubes only	=	„ „ 2 tubes only.
+ + +	= „ „ 3 tubes ..	=	„ „ 3 tubes.

Sedimentation-rate was observed after an hour in a 100 mm. column of citrated blood.

REFERENCES

Bing, J. (1940) *Acta. med. scand.* 103, 547.
Britton, C. J. C. (1945) *Middlesex Hosp. J.* 45, 39.
Gray, S. J. (1940) *Arch. intern. Med.* 65, 523.
— Barron, E. S. G. (1943) *J. clin. Invest.* 22, 191.
Hanger, F. M. (1939) *Ibid*, 18, 261.
Kabat, E. A., Hanger, F. M., Moore, D. H., Landow, H. (1943) *Ibid*, 22, 563.
Kass, E. H. (1945) *Science*, 101, 337.
Maclagan, N. F. (1944) *Brit. J. exp. Path.* 25, 234.
— (1946) *Proc. Ass. clin. Path.* 1, 22.
Magath T. B (1940) *J. Lab. clin. Med.* 26, 156.
Mateer, J. G., Baltz, J. I., Marion, D. F., MacMillan, J. M. (1943) *J. Amer. med. Ass.* 121, 723.
Nadler, S. B., Butler, M. F. (1942) *Surgery*, 11, 732.
Ornstein, I. (1937) *C.R. Soc. Biol. Paris*, 126, 510.
Pohle, F. J., Stewart, J. K. (1941) *J. clin. Invest.* 20, 241.

Sharp relief
with

Proctocaine
Local Anaesthetic-Analgesic
ALLEN & HANBURYS LTD. LONDON, W.1

In Muscular Rheumatism, Lumbago, Sciatica, Etc.

In lumbago, Proctocaine gives dramatic relief—from rigidity to painless mobility in a few minutes, so that the fibrositis subsides quickly. Lasting recovery from sciatica has followed two injections, each of 5 c.c. of Proctocaine, into the region of the nerve, a fortnight apart, the first being preceded by an induction anæsthetic. Two months' sciatica was relieved by 1 c.c.

Ampoules of

2 c.c. in boxes of	6 at	5/-	5 c.c. in boxes of	6 at	9/5½
2 „ „	12 „	9/5½	10 „ „	3 „	9/5½

PROCTOCAINE

LOCAL ANÆSTHETIC - ANALGESIC

ALLEN & HANBURYS LTD · LONDON · E 2
PHONE BISHOPSGATE 3201 (12 LINES) WIRES GREENBURYS BETH LONDON

œsophagus can swallow solids is undoubted, and this fact cannot be too strongly emphasised. Many years ago Grey Turner cited the cases of a woman who took her ordinary food for three days despite the presence of a plate of false teeth in her gullet, and that of a child who had remained well nourished although a halfpenny was lodged in the œsophagus for one year and ten months.

During the course of a lifetime every practitioner sees scores of patients who have swallowed various articles, and many of these complain of pain in the chest. It is generally believed that very few objects swallowed in this way become impacted, and consequently œsophagoscopy is not often undertaken. But Chevalier Jackson (1940) states that "in the College of Physicians of Philadelphia there are nearly 4000 objects, each o which has been removed from the air and food passag of patients at the bronchoscopic clinics of Philadelphi The cases reported here and others described in th literature may serve to show why we should become mor "œsophagoscope conscious."

My thanks are due to H.M. Coroners, North London an West London, for permission to publish the cases, and t Mr. E. Stanley Lee for his help in compiling the history in case 1

REFERENCES

Decoulx, P., Omez, Y. (1939) *Ann. Méd. lég.* 19, 144.
Jackson, C., Jackson, C. L. (1940) The March of Medicine: Ne York Academy of Medicine Lectures to the Laity, 1940, Londo
Turner, G. G. (1910) *Lancet*, i, 1335.
Watson-Williams, E. (1937) *J. Laryng.* 52, 264.

Reviews of Books

An Introduction to Clinical Neurology

GORDON HOLMES, M.D., F.R.S. Edinburgh: E. & S. Livingstone. Pp. 183. 12*s.* 6*d.*

THE distinctive feature of the British tradition in neurology is the intimate relationship between clinical neurology and neurophysiology. Everywhere clinical neurology is based upon neurophysiology, but nowhere else has neurophysiology been so much enriched by the work of clinicians. There is no more distinguished example of this than Dr. Gordon Holmes, whose work has contributed so much to our knowledge of the physiology of sensation, vision, and the cerebellum. Many, therefore, will welcome this book in which he makes available to a larger circle the teaching which generations of students at the National Hospital have valued and enjoyed. It is, as the title states, an introduction to clinical neurology, based upon the interpretation of neurological symptoms and signs in terms of anatomy and physiology. The main functional divisions of the nervous system are dealt with in turn, the motor system, muscle tone, convulsions, sensation, the reflexes, the visual system, speech, the sphincters, the autonomic nervous system, and the mental state, to mention the more important. The student beginning neurology will find here the necessary foundations of the subject, and the practising neurologist will enjoy the lucidity of the exposition.

The Surgical Teaching of Abdominal Operations

(4th ed.) J. L. SPIVACK, M.D., associate professor of surgery, University of Illinois. Springfield, Ill.: Charles C. Thomas. London: Baillière. Pp. 710. 55*s.*

THIS handsomely printed book has been considerably revised, yet remains an encyclopædia rather than an eclectic account of practical methods. Even so, there are omissions. Nine methods of gastropexy, an operation of doubtful value, are described, yet there is no account of the difficult dissection of the duodenum which is so often called for. Professor Spivack's ingenious methods of cholecyst-gastrostomy and the formation of an artificial anus are interesting. He is against aseptic methods of anastomosis for the stomach. The book will be read by experienced surgeons with much profit and entertainment.

Pediatric X-Ray Diagnosis

JOHN CAFFEY, A.B., M.D., associate professor of pediatrics, Columbia University, N.Y. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 838. 75*s.*

THIS is the first textbook in English on the use of X rays in the diagnosis of children's diseases and is an elaboration of Dr. Caffey's well-known section in Ross Golden's loose-leaf *System of Radiology*. The author was clearly a pædiatrician before becoming a radiologist, and while some of the finer points of radiological technique are missing, their loss is more than balanced by his excellent clinical judgment. In every section of this book the radiological appearances are assessed with the clinical and pathological findings, and where one preponderates suitable emphasis is laid on it. Rare diseases are but briefly mentioned and most of the text and illustrations deal with the common and important diagnostic problems. A striking commentary on the different values of X-ray diagnosis in children and adults is that the gastro-intestinal tract occupies only 60 pages while neurology gets 160, the bones 200, and the chest 200. The illustrations are well selected and enhanced by the addition of beautiful anatomical and pathological drawings. The book is the work of a practical man, demonstrating facts as he found them in over twenty years' experience in a children's hospital. It will be of great value to all radiologists, relatively few of whom have the opportunity to work in a large children's department. It should also prove a revelation to the many pædiatricians whose radiological outlook, in this country at least, has been limited by indifferent equipment.

Chemistry and Physiology of Hormones

Editor: FOREST RAY MOULTON. Washington: American Association for the Advancement of Science. Pp. 243.

THIS book, to quote the foreword, grew out of a research conference held at Gibson Island, Maryland, in 1943. There are 18 authors, workers in the fields in which they write. The policy has been to give résumés of the well-established findings on the various subjects, without excluding discussion of current work. Whilst the publication should be of value as a reference book for endocrinologists and teachers—there are some 1200 references—the more general reader, by intelligent selection, can read it with profit and pleasure. An index would have helped readers of both kinds. The 18 articles cover most of the known hormones and endocrine glands and the relationships between them; but some account of the synthetic hormones of the stilbœstrol type might well have been included. Our knowledge of the mode of action of insulin, conservatively estimated by Lukens, has since been increased by the observation of Price, Cori, and Colowick that insulin and anterior-pituitary extract are antagonistic to hexokinase. W. T. Salter, writing on euthyroidism and thyroid dysfunction, emphasises the clinical value of determinations of the level of protein-bound iodine in the blood.

L'hypertonie de décérébration chez l'homme

PIERRE MOLLARET, médecin des hôpitaux de Paris, professeur agrégé à la Faculté de Médecine, chef de service à l'Institut Pasteur; IVAN BERTRAND, directeur à l'École pratique des Hautes Études et de l'Institut de Neurobiologie (Salpêtrière). Paris: Masson. Pp. 15 Fr. 180.

THIS study of decerebrate rigidity (or, as the authors prefer to call it, "decerebrate hypertonia") is built round the detailed observation of a single case, in a man of 34 who fell a victim to Economo's encephalitis at the age of 17 and was nursed for the rest of his life in the Salpêtrière. During this long time he lay in a condition of mutism and paralysis in extension, voluntary movements being limited to the eyelids and upward movements of the eyes. The strict localisation of the lesions of this case to the substantia nigra, the commissure of Forel, and the red and dentate nuclei, combined with this clinical picture, leads the authors to argue in favour of Sherrington's original conception of decerebrate rigidity. The historical background and physiology of the neurological condition are traced, in the course of which the authors criticise the more recent attempts by British neurologists to amplify and, as they consider, confuse Sherrington's conception.

THE LANCET

LONDON: SATURDAY, SEPT. 28, 1946

Mothers in Jobs

> "An employer should not dismiss a woman simply because she marries or because she is pregnant but only if, for medical or other reasons, she is no longer fitted to her job and if no alternative work can be offered her."

P.E.P., in a somewhat optimistic broadsheet,[1] support the right of the mother to go to work if she wants to. Probably most British women regard a job as something to fill the interval between school and marriage, and accept as their serious work the task of rearing their children and looking after their homes; and if the State looked on this work as comparable in value with any other kind of work, the time and energy which mothers devote to it would not be limited by the earning capacity of the husband. Nevertheless if some accessory services—such as day nurseries and help in the home—were provided on an adequate scale, mothers might be released to share in industrial work, anyhow for part of their time. The war brought some changes on these lines. Family allowances recognise the value of children and so, indirectly, of mothers; day nurseries gave mothers more freedom for work when their services were acutely needed; and the usual discovery was made that women have deft fingers. In fact "there was found to be a greater reserve of ability among the unskilled and semi-skilled than had been imagined. This applied with particular force to women workers—married or single—who had in the past been confined mainly to the unskilled occupations." All the same, in an effort to fulfil its two purposes of raising a new generation and of providing labour and goods for this one, the State makes conflicting demands on women. If there is to be a labour shortage, as many women as possible must be helped to share in industry; yet a long-sighted policy would favour the bearing and rearing of children, for this will automatically lessen man-power shortage in the future. In this situation P.E.P. advise that women who want to work outside their homes must be allowed to do so by the removal of restrictions, occupational bars, and other impediments. If the principle of equal pay for equal work is accepted, women will cease to be "cheaper" than men and so may find their opportunities reduced in some occupations; in others they will no doubt hold their own, or perhaps gain ground. P.E.P. are concerned to reduce the conflict between motherhood and employment, and to remove the economic necessity which forces poorer mothers to remain at ill-paid work when they should, and would rather, be with their children.

Experience in industry shows that most pregnant women give up work between the 26th and 28th weeks, and comparatively few stay till the later stages of pregnancy. Of 83 women followed up, only 18 had returned to any sort of work 17 months after confinement. In 1931 three-quarters of all married women at work were in domestic service, the textile industry, and the clothing, distributive, and catering trades—all of which use much cheap casual labour. And though the war gave all women the chance of earning good pay, a return to normal peace-time conditions will again drive expectant mothers mainly into poorly paid and insecure jobs, chiefly because the service they have to offer is uncertain. Yet it has been shown quite clearly that properly safeguarded factory work is not harmful to pregnant women, and indeed may be specially suited to them because they can be supervised and transferred to appropriate types of work as need arises. Moreover, "factory or office work may be less exacting than looking after a house, attending to children, and standing in queues"—though many women combined both duties during the war. The main danger to the working mother is this double burden of job and housework, which may leave her no time to seek proper antenatal care. Some firms, during the war, arranged for antenatal care to be given in the factory, and found that women reported their pregnancies earlier to the factory nurse than they would have done to an outside clinic. P.E.P. feel that when the National Health Service is in action it would be better to encourage women to make full use of the outside maternity service rather than to duplicate such services inside factories. This can only be achieved if the mother has no fear of dismissal when she reports pregnancy, and if she is given time off to attend the clinic. At present medical supervision of mothers in direct relation to their work is unusual; yet it is essential, and can only be done properly by a doctor who understands the kind of work she is doing. The suggestion that the local antenatal clinic should hold sessions in or near the factory seems specially promising, and official food supplements might well be issued at the factory.

Apart from care and supervision, the working mother needs financial security and sufficient help with her child and her housework. She is at present entitled to the same maternity services as any other mother (some free, some paid for at fixed rates), and—under National Health Insurance—to free supervision by her panel doctor during pregnancy and after lying in. She has no statutory period of leave, and no maintenance allowance while she has to stay away from work. Under the Factory and Public Health Acts she may not be employed in industry during the first four weeks after delivery, but this rule is difficult to enforce and often ignored. She gets a single cash benefit of £2 (£4 if her husband is also insured) under the N.H.I. scheme; and sickness benefit, though not officially granted for pregnancy, is usually paid during the lost six weeks if a claim is made. Under the N.H.I. Acts, sickness benefit may not be paid "in any circumstances whatever" during the four weeks after confinement. Some 20% of married and 30% of unmarried mothers draw sickness benefit at some time in the three months after childbirth. Benefit rates are only a fraction of the amount needed for full maintenance of mother and child, so the temptation is strong for the needy mother to work up to the time of her confinement and to return to work as soon as she gets up. The Washington Convention of the International Labour Office in 1919 laid down as a minimum 12 weeks' maternity leave and cash benefits sufficient for "full and healthy maintenance for mother and child"; but this ruling was never ratified in Britain. In any case the period is much too

---

[1] Planning, no. 254, August 23, 1946. From P.E.P. (Political & Economic Planning), 16, Queen Anne's Gate, S.W.1.

Vitamins in diseases of the muscular system

Condition	Indications	Therapeutic Agents
ATONIC CONSTIPATION	Lack of tone affects the intestinal musculature A mixture of the B vitamins, preferably *in the form of food is found most* effective	**BEMAX** One heaped tablespoonful provides : 50/60 calories. *0 25/0 5 mg Vitamin B_1.* 1 0/1.5 mg available Iron and appreciable amounts of the Vitamin B_1 complex and Vit. E.
SPASTICITY ; paralysis agitans.	Vitamin B_6 has been found to reduce the muscular rigidity in ambulatory patients in whom the condition has not been of long standing.	**PYRIDOXIN Vitamins Ltd. :** 10 mg tablets, one or more thrice daily or 50/100 mg. daily by injection.
THE MYOPATHIES, muscular dystrophies and amyotrophic lateral sclerosis.	The disturbed muscle metabolism with increased creatinuria is found to respond in some cases to Vitamin E together with other factors in whole wheat germ	**BEMAX**. At least 1 oz. daily together with **FERTILOL** (whole wheat germ oil stabilised and standardised) *one 3 mg capsule thrice daily*
FIBROSITIS	The condition responds to wheat germ oil applied locally as an inunction and taken by mouth	**FERTILOL** one 3 mg capsule daily for prolonged periods possibly with Fertilol Cream applied locally
HYPOTONIA pink disease.	The association of hypotonia with loss of weight and digestive disturbances calls for high doses of both B_1 and B_6	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd :** 10 mg daily by mouth or injection. **PYRIDOXIN Vitamins Ltd.:** 10 mg. daily by mouth or 50 mg. by *injection. Later* **BEMAX** *can be given as part of the diet.*

Further particulars of the various vitamin products are obtainable on request from :

VITAMINS LIMITED

(Dept L.X.K.), Upper Mall, London, W.6.

'THIAZAMIDE' Sulphathiazole

TRADE MARK BRAND

Sulphathiazole is one of the most active of the sulphonamide drugs for the treatment of pneumococcal, gonococcal and haemolytic streptococcal infections.
Many regard it as the sulphonamide of choice for the treatment of urinary tract infections and gas gangrene.

TABLETS

Containers of 25 x 0.50 Gm.
" 100 x 0.50 Gm.
" 500 x 0.50 Gm

Containers of 25 x 0.125 Gm.
" 500 x 0.125 Gm.

PASTE

Contains 5 per cent. of sulphathiazole and is intended for topical application in cases of impetigo and in certain other coccal skin conditions.

Containers of 1 ounce.
" 16 ounces.

STERILISED POWDER

For topical application by sprinkling on superficial or open wounds for prophylaxis and early treatment.

Containers of 15 Gm.

CREAM

Contains 5 per cent. sulphathiazole and is used when the necessity arises for a soft water-miscible cream—e.g. as a first-aid dressing in burns, superficial cuts, etc.

Containers of 1 ounce
" 16 ounces

STERILISED POWDER

With 1 per cent. w/w Proflavine Hemisulphate For the prevention and treatment of wound infections by dusting over the surface.

Containers of 15 Gm.

EYE OINTMENT

An application which will secure prolonged contact of the therapeutic agent with the superficial tissues of the eye in chronic eye infections. It contains 10 per cent. of sulphathiazole.

Collapsible tubes of 5 Gm.

TREATMENT SHOULD BE DISCONTINUED AFTER FIVE DAYS

"May & Baker's sulphathiazole preparations are protected by British Patent No 533 495 which was granted on 24th May, 1946 jointly to May & Baker Limited and Ciba Limited of Basle"

manufactured by **MAY & BAKER LTD.**

distributors PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM

9039

hoping that rest and general measures will mitigate the cardiac damage It seems possible, however, that succinate will replace salicylate. GUBNER and SZUCS[6] treated 65 cases with an average of 4·5 g. of sodium salicylate daily, and compared these with 55 cases receiving a similar amount of the calcium double salt of benzoic acid and succinic acid benzyl ester together with ascorbic acid. The succinate group showed a shorter clinical course, a much lower incidence of carditis (as shown, for example, by prolongation of the P-R interval), and an apparently lower incidence of valvular disease developing within one to six months. Succinic acid acts as a catalyst in some biological oxidations, and there is enough evidence of derangement of tissue oxidations in rheumatic fever to make its trial plausible on metabolic grounds. The clinician will await further experience.

Surgery of the Œsophagus

THE widening scope of surgery in the treatment of diseases of the œsophagus is illustrated by the spate of technical modifications and the increasing size of published series, compared with the isolated protocols of a few years ago.

Malignant disease comes in for most attention, and CLAGETT[1] now reports 54 operations for carcinoma of the cardia of the stomach or lower œsophagus using the thoracic approach. Of these growths, 24 were inoperable but no complications resulted from the thoracotomy. In the other 30 the growth was resected and continuity restored, with only 5 deaths. It should be noted that only 3 of these were defined as œsophageal carcinomata, the remaining 27 being growths of the upper stomach. CLAGETT also records 2 resections for benign conditions. The virtue of this route in the approach to high gastric lesions has been clearly established. Lesions in the middle third of the œsophagus lend themselves less readily to operation. It has been shown that by mobilisation of the stomach well up into the chest, after incision of the diaphragm, an œsophago-gastrostomy as high as the arch of the aorta is practicable.[2] Most of these anastomoses have been performed on the left side, though IVOR LEWIS[3] has had good results with a right-sided thoracotomy and anastomosis after preliminary abdominal mobilisation of the stomach.

Some benign strictures and high growths cannot be dealt with in this way, and continuity between pharynx and stomach can then be established only by some form of extrathoracic gut or skin tube method. With stricture, excision of the œsophagus is unnecessary, and an artificial gullet is the method of choice; the same applies to total removal of the œsophagus after the Torek and pull-through types of operation. The skin funnel operation has the disadvantages that the funnel is inert, and may become lined with and clogged by hair. Jejunal or gut loops, if properly constructed, convey food from the pharynx to the stomach without artificial assistance, but their length is limited by the distance to which the mesenteric blood-vessels will reach. YUDIN[4] in a series of 80 cases used a skin tube in 6 instances and a jejunal loop in 16; in the remaining 58 patients the two methods were combined. A recent modification mainly applicable to strictures consists in using an isolated jejunal loop as a free subcutaneous graft. LONGMIRE and RAVITCH[5] have shown that a long segment of gut can be exteriorised and placed subcutaneously, with its blood-supply initially left intact. The gut is then in stages surrounded by skin flaps to make a tube, and the mesenteric vessels are gradually and increasingly constricted until the gut-skin tube is viable. After division of its original blood-supply the tube is moved, again in stages, to the front of the sternum, where it is ultimately united to the cervical œsophagus and stomach. This procedure is tedious, involving many operations, but only the initial abdominal operation need be regarded as a major undertaking. The method ensures that an adequate length of jejunum is available for the artificial œsophagus; and it overcomes the principal objection to the usual operation, in which the length of bowel is determined by the mobility of the mesentery. Localised strictures in the lower œsophagus are more easily dealt with; failing gradual dilatation, they can usually be treated by a plastic operation on the lines of a pyloroplasty. With severe or long narrowings, an anastomosis between stomach and œsophagus through a small diaphragmatic incision will by-pass the stricture satisfactorily. CLARK and ADAMS[6] have practised one form of this operation in 5 cases; in 3 no known ætiological factor was established, while in another case the stricture appeared to be associated with generalised scleroderma.

For the many young people with œsophageal stricture or cardiospasm the chances of cure by radical surgery should be carefully considered before the patient is condemned to a life of dilatations or bougie swallowing. Furthermore, the difficulty in differentiating between carcinoma and some forms of stricture makes it imperative to consider thoracotomy in any case of doubt.

---

[6] Gubner, R., Szucs, M. *New Engl. J. Med.* 1945, 233, 652.

[1] Clagett, O. T. *Proc. Mayo Clin.* 1945, 20, 506.
[2] Garlock, J. H. *Surg. Gynec. Obstet.* 1944, 78, 23.
[3] Lewis, I. *Brit. J. Surg.* 1946, 34, 18.
[4] Yudin, S. S. *Surg. Gynec. Obstet.* 1944, 78, 561.
[5] Longmire, W. P., Ravitch, M. M. *Ann. Surg.* 1946, 123, 819.
[6] Clark, D. E., Adams, W. E. *Ibid*, 1945, 122, 942.

MEDICAL STUDENTS AND THE BILL.—The British Medical Students' Association sent a questionary on the National Health Service Bill to 10,106 students in medical schools in England, Wales, and Scotland. Of the 3801 (37·6%) who replied, 17% were definitely opposed to the principle of a comprehensive National Health Service, while over 80% were in favour. As to whether the present Bill will improve the medical services opinion was almost evenly divided. A small majority preferred the hospitals to remain under present administration, and a large majority disapproved of the transfer of voluntary hospital endowments to a new fund for redistribution.

Assuming that there is to be a service, opinion was strongly in favour of practitioners and specialists being allowed to conduct private practice along with their work in the service, as is proposed by the Bill. The combination of salary and capitation fees was approved (64%), though 18% favoured capitation fees alone and about 12% salary alone. The prohibition on the sale of N.H.S. practices (as proposed by the Bill) was accepted by 53% to 40%, but the power of the Medical Practices Committee to prohibit a doctor from practising in a particular area was not approved (47% for, 50% against). Nearly 60% disagreed with the composition of the local executive councils: where a reason was given it was that the councils should include more professional men.

Despite this disagreement about details, and uncertain approval of the Bill as a whole, over 60% of the students who answered the questionary expressed a willingness to work in the new National Health Service, provided remuneration is suitable and the regulations made by the Minister are acceptable.

short for the best interests of the child. The Royal College of Obstetricians and Gynæcologists have suggested that the mother should be free from all outside responsibilities for the first six months of the child's life—a view which is as strongly supported by psychological as by physiological findings. The introduction, under the National Insurance Act, of a weekly maternity benefit of 36s. for 13 weeks, to be paid on condition that the mother abstains from work, will do something, but clearly not enough. P.E.P. would like an extension of the period to be considered at once. Moreover, for the mother who has no husband to supplement it, the rate is too low, even when family allowances are taken into consideration. A National Assistance Service, to inquire into individual cases, is thought to be the solution; but the word "assistance" in the title of an official body has now an unpleasing sound in many ears. Public Assistance, carrying on the old poor-law stigma, is not always administered with tact and consideration. A special children's allowance to be paid to mothers with no source of income but their own earnings would meet the case better. The development of nursery schools of the best type and the growth of home-help services are also essential if mothers are to take part in industry without detriment to their main career; for the old sneer about the woman's place being the home gains a different significance once we realise that the output of the home compares favourably with that of the workshop—that children, in short, are more valuable than commodities.

Salicylates in Acute Rheumatism

THE generally accepted view of the action of salicylates in rheumatic fever is that they cause the fever and the arthritis to subside but do not affect the fundamental course of the disease or the development of endocarditis and valve lesions. It is still uncertain whether their febrifuge effect is merely that of an antipyretic acting on the temperature-regulating centre, or whether it is more complex and in some way specific to rheumatic fever. Doubt has also been expressed as to whether the joint effect is anything more than analgesic, seeing that in the natural course of the disease a given joint is swollen and painful usually for only a few days. Recent work in America has attacked these problems afresh, but as yet no finality has been reached.

In 1943 COBURN[1] attracted considerable attention for a claim that sufficiently high doses of salicylate suppress the rheumatic inflammatory process and may prevent lasting cardiac damage. With a new chemical method he was able to determine salicyl radicle concentrations in blood. To maintain a plasma salicylate level of 35 mg. per 100 c.cm. a daily dose of 10 grammes or more of sodium salicylate is necessary, and to reach that level quickly the early doses must be given intravenously. Of 38 patients with rheumatic fever so treated—young men from the American Navy—all are said to have escaped valvular heart disease, while of 63 similar cases treated with only enough salicylate to relieve the symptoms 21 developed valve lesions. Unfortunately the details, and especially the duration, of subsequent observation are not stated, and the conclusion must be accepted with reserve. Yet the case-records, showing relief of symptoms in a few hours with intravenous salicylate, the fall of temperature in 1–2 days, and the return of blood-sedimentation rates almost to normal in a week or two, are impressive. In some severe cases salicylate levels of 60 mg. per 100 c.cm. were reached and except in one patient who developed a toxic psychosis the only untoward effect mentioned was mild tinnitus. At John's Hopkins Hospital MURPHY[2] tested COBURN's claim by making a careful study of 12 patients with acute rheumatism receiving doses of salicylate large enough to maintain plasma salicylate levels of over 30 mg. per 100 c.cm. in nearly every case. The diameters of 24 swollen joints were accurately measured: 4 had decreased before salicylate therapy was begun; 2 decreased within twenty-four hours, 3 in forty-eight hours, 6 in up to five days, 2 after five to eight days, and 5 not at all in twenty-one days; 2 joints became involved for the first time on the fifteenth day of continuing salicylate therapy. Furthermore these patients developed various fresh rheumatic lesions during the intensive salicylate treatment, such as nodules on tendon sheaths, pneumonitis, tenosynovitis, and episcleral nodules; and some of these were confirmed by histological study. MURPHY concludes by doubting the accepted view that salicylates promote the subsidence of rheumatic joint inflammation. WÉGRIA and SMULL[3] compared 21 cases of rheumatic fever given salicylates in doses that promptly established and maintained 35–50 mg. salicylate per 100 c.cm. blood, and 19 cases treated with smaller doses. They could see no difference in the duration of the attack or in the behaviour of the sedimentation-rate of the two groups. Of toxic reactions, in the "adequately treated" group they describe tinnitus and deafness as common; vomiting as infrequent; hyperpnœa and tachycardia as occurring at levels of blood salicylate over 50 g. per 100 c.cm. MANCHESTER,[4] from an American naval hospital, accepts COBURN's view of the effectiveness of salicylates in suppressing inflammation and preventing cardiac residua, and describes in greater detail the toxic effects of continued high dosage. Hypoprothrombinæmia develops early, but is not severe and does not progress. Delirium can be caused by rapid intravenous infusion, raising the blood salicylate level too quickly. Hyperpnœa is due to acidosis and can be prevented by the simultaneous administration of alkali. JAGER and ALWAY[5] report on 26 cases of acute rheumatic infection treated with a long and intensive course of salicylates. Their results are not uniformly favourable, since both raised sedimentation-rates and other evidences of rheumatic activity persisted in many patients. Nor, as they say, is the follow-up adequate.

So far, then, the American evidence is conflicting. The advocates of intensive salicylate therapy write from naval hospitals, and it may be that rheumatic fever behaves somewhat differently in picked young men, so that results in them are not comparable with those in mixed general hospital patients. There seems no need as yet for doctors on this side of the water to depart from their time-honoured practice of giving salicylates by mouth in rheumatic fever, in doses just large enough to induce tinnitus, for at least as long as the fever and the arthritis last, and of

---

1. Coburn, A. F. *Bull. Johns Hopk. Hosp.* 1943, 73, 435.
2. Murphy, G. E. *Ibid*, 1945, 77, 1.
3. Wégria, R., Smull, K. *J. Amer. med. Ass.* 1945, 129, 485.
4. Manchester, R. C. *Ibid*, 1946, 131, 209.
5. Jager, B. V., Alway, R. *Amer. J. med. Sc* 946, 211, 273.

or November, he has given notice to the Insurance Committee in writing of his desire to transfer, whereupon he will be entitled to transfer as from the end of March, June, September, or December next following, but such transfer can be effected only if the new doctor agrees to accept him. If our correspondent tries to take advantage of this regulation, his present doctor will probably tell him that he must wait until his old doctor has been back for a year.

The protection of practices scheme is supposed to apply in exactly the same way to private patients, but these do not hold medical cards and when applying for treatment they often omit to explain that they are really patients of an absentee doctor.

MEGALOBLASTIC ANÆMIA IN CHILDREN

ANÆMIA with high colour-index and large red-blood cells does occur in infancy and childhood, but the frequencies of its causes are quite different from those in adult life. The commonest cause in childhood is nutritional deficiency, either primary or secondary to cœliac disease; Blackfan and Diamond [1] have seen it in acute infections in infants with temporary achlorhydria; hæmolytic syndromes, like erythroblastosis fœtalis and familial acholuric jaundice, and leukæmias are not uncommon causes. There has been much argument about the incidence of true pernicious anæmia before adult life and the evidence has been reviewed by Peterson and Dunn.[2] They point out that the following criteria are essential for establishing the diagnosis of pernicious anæmia *in childhood*: macrocytic anæmia, gastric achlorhydria resistant to histamine stimulation, megaloblastic change in the bone-marrow, a specific response to liver treatment, and the necessity for continued treatment to prevent a relapse. Examined by this strict standard, every case but two reported up to 1942 failed to qualify; not a few had free HCl in the gastric juice, others showed no relapse after liver treatment was stopped, some were clearly nutritional cases, and in many the evidence was inadequate or rested primarily on post-mortem changes.

Pohl [3] described the case of a girl of 13 years who was studied for 4 years and presented all the features of pernicious anæmia: Dedichen [4] reported a macrocytic anæmia in a child of 13 months in whom repeated relapses were observed over a period of 3 years whenever liver treatment was stopped. Peterson and Dunn describe a case of their own, in a child of 13 months who was admitted because of diarrhœa and pallor; the red-cell count was 810,000 per c.mm., hæmoglobin 2 g. per 100 c.cm., colour-index 0·82, white cells 62,000 per c.mm., with 90% lymphocytes and 8% "smudges," and reticulocytes 14%. It is not surprising that pernicious anæmia did not figure in their original differential diagnosis; the child was transfused and not given liver until 3 months later, when it produced a surprisingly good effect. The patient relapsed several times; during her fourth relapse, 3½ years later, the bone-marrow proved to be megaloblastic; gastric achlorhydria had been noted previously. It was found that the girl had an iron-deficiency, and when this was remedied she improved remarkably and the blood-count became normal. Nine months later a mild normochromic anæmia was remedied by increasing the dose of liver extract; the white cells were then normal and with normal distribution. That such an extraordinary case should be reported as pernicious anæmia emphasises the diagnostic difficulties that arise in children; yet, apart from the absence of macrocytosis and the curious lymphocytosis, the case conformed to all the criteria given above, and the lack of macrocytosis is attributed to the iron-deficiency.

Davis [5] has described 3 cases of macrocytic anæmia in children. The first was in an underdeveloped girl of 13 years who had a megaloblastic marrow and, at first, free acid in the gastric juice; she was treated, but 3 years later was seen in a relapse when she had achlorhydria and responded to a purified liver extract used for treating pernicious anæmia; it is clear that had she been seen for the first time at the age of 16 she would have been regarded as a case of pernicious anæmia. His second patient was a boy of 14 years who had achlorhydria and megaloblastic marrow; a purified liver extract was ineffective, but proteolysed liver by mouth and a crude liver extract parenterally produced a remission after which no further treatment was needed. The third patient, a girl of 3 years, resembled the second, but gastric acid secretion was present. Neither of these patients would be classified as pernicious anæmia. Recently Zuelzer and Ogden [6] in Detroit have drawn attention to a macrocytic anæmia in infants aged up to 18 months that they found to be quite common, and they give details of 25 cases. The bone-marrow, aspirated from the femur, was typically megaloblastic, gastric achlorhydria was present in some; the anæmia was severe and clinically the patients had pallor, fever, vomiting, diarrhœa, and sometimes petechiæ. All except 5 of the infants responded rapidly to liver extract or to folic acid, and so far these have not relapsed; the 5 exceptions died from complications, mostly infective.

From all this evidence it can be deduced that a macrocytic anæmia with megaloblastic change in the bone-marrow is fairly common in infancy and childhood. It should be distinguished from other forms of macrocytic anæmia, since most of the patients respond to liver extracts; ordinary crude extracts should be used and not the purified extracts specially designed for the treatment of pernicious anæmia, like '*Anahæmin*'; Zuelzer and Ogden's results suggest that it will be worth while to try folic acid for these patients. It is doubtful whether true relapsing pernicious anæmia of adult type does occur before puberty, and the outlook for the children who seem to have the disease is relatively good, since they nearly all show a lasting response to liver, and if they weather the original crisis they will recover permanently. It seems reasonable that the name "megaloblastic anæmia," which describes the main diagnostic features of the disease without confusing it with pernicious anæmia, should be adopted.

MECHANISM OF PAIN

IN his founder's lecture at the annual congress of the Chartered Society of Physiotherapists on Sept. 14, Prof. G. W. Pickering spoke of the pain mechanism in man as consisting of three essential parts: the sensory nerve-ending or receptor, the nerve-fibre or conductor, and the brain or cortical analyser. Receptors were very numerous in the skin and liberally provided in the deep fascial and muscular structures, but rather few in the subcutaneous tissues. The parietal layers of the serous membranes were well supplied, but the visceral layers and the viscera themselves not at all, though perhaps there was some evidence that the pains of angina and peptic ulcer do arise directly in the organs concerned. Periosteum and ligaments were sensitive, spongy bone slightly so, compact bone and joint surfaces insensitive; arteries possessed more receptors than veins, and the meninges were profusely studded with them, whereas the brain itself had none.

The tissue changes which produced excitation of these receptors might be physical, a deformation of surface producing alteration in configuration and tension; or chemical, like the pain of claudication due to the accumulation of metabolites in muscle-fibres, peptic-

---

1. Blackfan, K. D., Diamond, L. K. Atlas of the Blood in Children, London, 1944.
2. Peterson, J. C., Dunn, S. C. *Amer. J. Dis. Child.* 1946, 71, 252.
3. Pohl, C. *Mschr. Kinderheilk.* 1940, 84, 192.
4. Dedichen, J. *Acta med. scand.* 1942, 111, 90.
5. Davis, L. J. *Arch. Dis. Childh.* 1944, 19, 147.
6. Zuelzer, W. W., Ogden, F. N. *Amer. J. Dis. Child.* 1946, 71, 211.

Annotations

THE BASLE MEETING

LAST week's British-Swiss medical conference (see p. 464) was more than once likened to a peace conference; and, as at peace conferences, much of the most important work was done outside the formal meetings. Workers in both countries were eager to hear, at first hand, what had been done in the long period of segregation, and were often astonished at the parallel developments in the war years. The papers themselves, to which the *Schweizerische medizinische Wochenschrift* devoted a special number in English, gave an excellent symposium of recent advances in both countries. It may be hoped that the visitors learnt something of the example by the Swiss Academy of Medical Sciences in its preparations for the meeting. The papers themselves were all read in English with simultaneous translation, through earphones, into German—a device whose excellence has been equalled, Sir Heneage Ogilvie remarked, only at the Nuremberg trials. Delegates might perhaps have found it easier to make contact with one another if each had worn a rosette bearing his name; and it might have been an advantage to discuss each paper after it was read rather than at a single discussion in the evening. But these are small points.

Swiss doctors are eager to hear more of British medicine; it was therefore disappointing to find that, despite demand, the leading bookshops, though stocking American works, had been unable to obtain British textbooks, and, in particular, textbooks of medicine. The value of sending British publications to other countries is not solely commercial; and it is to be hoped that the precedent of the *British Medical Bulletin*, which is readily obtainable overseas, will be applied to books before the habit of buying those published elsewhere has become too firmly established.

At the banquet given by the academy, Prof. Karl Wegelin, the president, emphasised the strength of the bonds between Switzerland and Britain. Dr. Peter, president of the Basle council, spoke with eloquence of the feeling in that city, so near the frontiers that the sounds of war in both France and Germany had been heard. The Swiss people had, he said, been sustained by the spirit of the British, who had preserved democracy for Europe and the world; the best hope for the future lay in closer personal relations, and it was such meetings as the present that helped to foster international understanding. Professor Lutz, dean of the medical faculty at Basle University, called for an objective approach to international affairs; and Dr. Leuch welcomed the guests on behalf of the Swiss federation of doctors. Sir Heneage Ogilvie, replying for the visitors, showed a knowledge of Switzerland which gratified his countrymen no less than their Swiss hosts.

EXTRANEOUS CAUSES OF UTERINE BLEEDING

WHEN faced with a case of menorrhagia or epimenorrhœa, the average clinician thinks of organic pelvic disease, whose existence he proves or excludes by pelvic examination. If he finds the genital tract clinically normal, the condition is labelled as functional or endocrinopathic bleeding, and there the matter may rest. It is important to realise that there are other causes of bleeding and that organic disease, if present, may not necessarily be the primary cause of the hæmorrhage.[1]

Benign myometrial or adnexal lesions can hardly be considered as primary factors in uterine hæmorrhage, though they may aggravate bleeding by interfering with hormonal control or the dynamics of the pelvis. It is, moreover, questionable whether it is fair to blame an endocrinopathy for all or many of the uterine hæmorrhages which are attributed to that cause. The influence of the central nervous system is well known: fright, fatigue, sexual excess, change of environment, or emotional shock often lead to irregularities in menstrual function. The menstrual rhythm may also be disturbed by physical agents, such as change of climate or of weather, and the effects of high altitude; thus waitresses working on the Jungfrau-joch had to return to lower levels because of severe menorrhagia. Not only the pituitary and the ovary but other endocrine glands affect menstruation. Hypothyroidism in 75% of cases leads to menorrhagia, whereas hyperthyroidism as a rule results in hypomenorrhœa or even amenorrhœa. Diabetic women tend to suffer from ovarian degeneration, but if stabilised with insulin menstrual function remains normal. Infectious diseases and upper respiratory infections such as the common cold, influenza, and pneumonia may delay the onset of a period.

Blood dyscrasias must also be considered: more than 50% of women with idiopathic hypochromic anæmia have menorrhagia. Essential thrombocytopenic purpura may be suggested by severe uterine bleeding at the menarche. Secondary thrombocytopenia from such causes as malignant disease, leukæmia, septicæmia, arsenical poisoning, and X rays and radium must not be forgotten; pseudo-hæmophilia is a further cause of menorrhagia, and idiopathic hypoprothrombinæmia and hereditary telangiectases are among the rare causes. Deficiency of vitamins B, C, and K has often been suggested as a possible cause of excessive uterine bleeding; and various types of heart disease and chronic nephritis must not be overlooked.

The gynæcologist confronted with a case of menorrhagia should recall that he is not dealing with an isolated region between the umbilicus and the perineum, and that curettage and endocrine treatment are not the final answer for every patient with functional bleeding.

SNAGS IN PROTECTION OF PRACTICES

A CORRESPONDENT complains that, being an insured person, when his family doctor returns after 7 years in the Forces he must give up his present doctor for at least a year, whether he goes back to his old doctor or not. This is quite true. Men who have served in the Forces expect reinstatement in their jobs when they are released, and the scheme for the protection of practices is an attempt on the part of doctors to secure that those of their colleagues who have been on national service can return to their jobs on release. Schemes vary in detail, but broadly speaking they provide that doctors who have joined—and this covers the great majority of insurance practitioners—will refuse to accept on their own behalf any patients of an absentee doctor until a year after the absentee's return or a year after the termination of the emergency, whichever is earlier. They have agreed that, if a patient of an absentee doctor applies for treatment they will tell the patient that they will attend only on the absentee's behalf. They are also required to display in their surgery a printed notice intimating that during the absence of a doctor on Service his patients will be attended by a home doctor in the neighbourhood and on the return of the absentee they will be expected to seek any advice required from him.

If our correspondent has removed from the district in which his old doctor practised he can transfer permanently to the list of another doctor by using part "B" of his medical card; otherwise, if he wants to transfer to another doctor he should ask his old doctor to sign part "C" of his medical card consenting to an immediate transfer. If the doctor signs—but he is not compelled to do so—this will absolve other acting practitioners from their pledge so far as that particular insured person is concerned. The Medical Benefit Regulations provide that an insured person may transfer at the end of a quarter if, not later than the last day of February, May, August,

---

[1] Frank, I. L. *Amer. J. med. Sci.* 1946, 210, 787.

Special Articles

WORLD PROBLEMS OF NUTRITION

F.A.O. CONFERENCE AT COPENHAGEN

FROM OUR CORRESPONDENT

THE Food and Agriculture Organisation held its second annual conference at Copenhagen from Sept. 2 to 13. Its principal work was to consider the proposal of the director-general, Sir John Boyd Orr, F.R.S., for the establishment of a World Food Board. This board would attempt to stabilise prices of agricultural commodities in the world market, providing the necessary funds; to establish a world food reserve equipped for any emergency that might arise through failure of crops in any part of the world; and to coöperate with organisations concerned with international credits for industrial and agricultural development and with trade and commodity policy. The conference appointed a commission to sit at once and draw up a detailed plan for the board. This is to be submitted to an adjourned meeting of the conference early next year.

The standing advisory committee on nutrition, whose chairman is Lord Horder, in its first report to the director-general recommended governments to keep a careful watch on the food situation in their countries, for which purpose, it says, diet surveys are of great value in assessing dietary defects and formulating food-supply requirements. F.A.O. should ask nutrition experts in the various countries to study the methodology of diet surveys with the ultimate aim of securing comparability of results and perhaps evolving standard types of survey. On school feeding the committee recommended that F.A.O. should study school-feeding programmes in different countries, covering all ages, with reference to the type of food-supplies, organisation, cost, and effects on health. Information about successful methods of school feeding may assist governments to develop satisfactory programmes, particularly where school feeding has not been organised.

The committee laid stress on the need for studying milling, processing, fortification, and preparation of cereals in relation to nutrition. It suggested that F.A.O. should study a number of staple cereals, such as wheat, rice, maize, and rye, to ascertain the effect of these operations on their nutritive value. The relation between extraction-rates and vitamin-B_1 content of wheat calls for investigation. The "fortification" of wheat-flour or bread includes the addition of vitamins, calcium salts, skim-milk, and other kinds of flour, such as soya-bean flour. Information about the methods adopted by different countries for conserving or enhancing the nutritive value of wheat-flour would be of value to other countries. Parallel problems of rice-processing should also be examined. Highly milled raw rice is poor in vitamins, notably B_1, and investigation is needed to decide which methods—e.g., under-milling, parboiling, and enrichment—are likely to be most satisfactory in the rice-eating countries. The effect of household methods on the nutritive value of rice should likewise be studied; for instance, the washing of raw rice may remove a considerable proportion of certain nutrients. There seems to be a relation between the processing of maize and the incidence of pellagra; the F.A.O. nutrition programme should therefore include a survey of the methods of milling, processing, and preparing maize.

Perishable foods, such as milk, vegetables, and fruits, also call for special attention if their nutritive value is to be safeguarded; and further study is required on the utilisation of whole-fish meal and the inclusion in canned meat of ground fresh bone.

EDUCATION IN NUTRITION

This subject has three main aspects: (1) the training of specialised workers; (2) the instruction of persons able to help in the campaign for improving nutrition; and (3) the education of the people with the object of improving their dietary habits. In studying and attacking nutrition problems the lead must be taken by a "core" of specialised nutrition experts. To accelerate progress systematic instruction in food and nutrition, both theoretical and practical, must also be given to administrators, agricultural experts, food technologists, teachers, nurses, and social workers. The committee agreed unanimously that the teaching of nutrition in various curricula, especially medicine, is unsatisfactory. University authorities and others concerned with higher education should give nutrition a place in their curricula in keeping with its importance. The position of the doctor, the committee point out, is unique: his opportunities of teaching and applying the principles of nutrition are unequalled by those of any other member of the community. His training in nutrition should therefore be thorough, and progress is not likely to be made here until nutrition holds a conspicuous place in the medical curriculum approved by the statutory bodies which control it in the various countries. The principles of nutrition should be inculcated in the child at home and at school, and for the teaching of sound dietary habits to children school feeding is useful. Similarly, the organised feeding of workers is a valuable means of teaching adults.

The education of housewives is of great importance, and one means of providing it is through courses in domestic science, which should be introduced in countries where they do not exist. Voluntary groups, properly guided, can do a good deal to spread a knowledge of nutrition among the general public. Advertisements educate the public, and therefore advertisement of the nutritive value of food products should be controlled. In countries deficient in food the emphasis in education should be laid on the best means of utilising available supplies; in those with a surplus the need for consuming diets of the highest standards should be stressed.

The war experience of countries with comprehensive control plans—amounting almost to large-scale human feeding experiments—contains valuable lessons.

NATIONAL COMMITTEES

At the outbreak of the war national nutrition committees or councils existed in over thirty countries, many as a result of stimulus by the League of Nations. Only a few of these are still effective. The committee recommended, therefore, that a comprehensive report should be prepared on their present situation. Such committees may be identical with the F.A.O. national committees, but in many countries this is neither possible nor desirable, though the two committees should be closely associated. The nutrition committees must be guided by trained nutrition workers, have adequate facilities and financial support for research, and be able to influence their governments. They must have the coöperation of governmental and other agencies—e.g., ministries, labour unions, domestic science organisations, and charitable societies—that are anxious to improve the nutrition of the population and possess the necessary means and personnel. Besides merely urging governments to establish committees F.A.O. should study realistically the conditions necessary for their satisfactory operation.

F.A.O. must know where to seek effective collaboration from nutrition organisations and workers, and an index of these throughout the world should be prepared. The staff of the nutrition division should establish contact with workers in various countries.

Nearly all practical nutrition problems will also concern the World Health Organisation. The committee recommends that a joint nutrition committee should be set up between the two bodies, which should consult together about the choice of their nutrition staff.

NUTRITIONAL STANDARDS

The nutrition committee of the conference, which has some common membership with the standing advisory committee, accepted its recommendations and suggested certain directions in which they could be implemented. It pointed out, for instance, that the expression of food commodities in terms of nutrients requires the use of appropriate tables on food composition. This does not mean a single international figure for each food, for there are real differences in the nutritive value of foods in different parts of the world. Nevertheless, the values used by countries in preparing statistical material for international consideration should be derived by com-ulcer pain from stimulation by acid, and the continued pain of burns. It was the analyser's function to receive these impulses after transmission, to relate them to past experiences, and to form an image for purposes of description. Sir Thomas Lewis had shown that the quality of pain arising in the skin surface was always the same whether the stimulus was pinching, pulling, or burning. With the skin anæsthetised and the deeper structures stimulated, the subject could always tell that the pain was not arising in the skin though he could not localise it to fascia or bone. Thus, from the point of view of quality, there were only two kinds of pain—one from the skin, and one from beneath the skin. Visceral pain was not distinguished in quality from ligamentous or muscular pain, and any other "qualities" were due only to mental associations and could be excluded by eliminating visual and other factors. The intensity of a pain was largely determined by the behaviour of the analyser. Hence the racial range of susceptibility, the emotional influence which produced the painless mutilations of religious ecstasy and the exaltation of pain by apprehension, and the effects of suggestion on the state of inhibition or excitation of the cortical analyser. It was interesting to speculate how much the beneficial results of physiotherapy were due to such suggestion. One of the most fascinating problems of pain was the phenomenon of reference. Skin pain was accurately localised, while visceral pain was not. It was to explain the fact that visceral pain did not correspond closely to the organ of origin that James Mackenzie introduced his conception of the viscero-sensory reflex with enhanced excitability of the particular cord-segment involved. More recently, Kellgren's[1] work on the segmental reference of pain excited from the interspinous ligaments had thrown further light on the whole subject.

In a sense, said Professor Pickering, it might be more reasonable to ask why pain was so well localised in the skin at all, rather than why visceral pain was referred. The answer probably lay in the increasing knowledge and experience gained by the cortical analyser in development, an education associated with visual knowledge of events in local areas of the body surface. This educability of the analyser was well shown in the fineness of touch acquired by the blind. With the deeper structures such an education was obviously impossible; there was much less correlation with outside influences, and the pain was felt over a wide area determined by the segmental nerve-supply.

PLAGUE VACCINE

DURING the last half century over forty million doses of plague vaccine have been issued by the Haffkine Institute in Bombay. These have been used in different parts of India whenever plague has appeared in epidemic form and it is claimed that thereby several million lives have been saved. The method of preparation of this vaccine has varied from time to time, especially in the last fifteen years, but during most of this period a broth vaccine killed at 65° C, as first introduced by Haffkine, was used; later, lower temperatures were used for killing the organisms.

The claim for the prophylactic value of this vaccine was based first on animal experiment, and then on the extensive field experience in the plague-stricken areas in India and elsewhere in the East. Statistics collected in India indicated that the vaccine reduced the chances of exposed persons becoming infected to a quarter and the chance of dying of plague to an eighth of what they would otherwise have been, whereas in Java it was claimed that the infection-rate was reduced to a third or a half. In 1907 Strong, working in the Philippines, used living avirulent vaccine with success, but he did not pursue this line of work because of the practical disadvantages of such a vaccine, and nearly forty years later his opinion on its impracticability on a large scale is unchanged. The value of the Haffkine vaccine began to be questioned in the early 1930s. Figures from Madagascar, Central Africa, and elsewhere seemed to indicate that the vaccine was useless, and the methods of obtaining the data on which the favourable claims had been based in India were severely criticised by statisticians. This led to a reinvestigation of the living avirulent vaccine, more particularly by Girard and Robic in Madagascar in 1933 and in the following year by Otten in Java. Animal experiments reveal a much higher protective value for the living vaccine than is ever obtained by killed vaccine; ten million doses were given in the Dutch East Indies up to 1941 without producing a single case of plague, and a tenfold reduction in the death-rate from plague was reported in those vaccinated.

It is now generally agreed that the living avirulent vaccine is more efficacious than any killed vaccine, and only the difficulties of its preparation and distribution have prevented its general adoption. The dangers inherent in the preparation of a living vaccine, especially in tropical countries, are obvious. There is apparently no danger that these avirulent organisms will regain their virulence, but if the vaccine is kept too long it loses its protecting property. The safe limits are between the 5th and 15th day after preparation; this is far too short a period to allow distribution in a large country such as India or among the far-flung fighting forces of the United States in the late war, to take two examples. The U.S. Services therefore used a killed vaccine, and they chose one containing 2000 million organisms per ml., of which 0·5 ml. was given as the first dose followed by 1·0 ml. a week to ten days later; "booster" doses of 1·0 ml. were given periodically when the danger from infection was imminent.

THE BASIC NURSING COURSE

WE have often put the case for a two-year course in practical nursing for all entrants to the nursing profession, to be followed—for those who wish to apply for senior posts or to specialise—by a much stiffer training, demanding a higher standard of theory than the present curriculum. We believe this would have the double advantage of reviving interest in nursing technique and research, and of developing to the full the abilities of every type of student, whether her bent is practical or academic or both.

It is encouraging to learn that the County Councils Association have now endorsed this policy. The *Public Assistance Journal*[1] announces that the association's executive council has accepted the following resolutions previously passed by the Association of County Medical Officers of Health:

1. There should be a basic training of two years for all nurses, some of which period should be spent in nursing the chronic sick. The training should be essentially practical.
2. After that training and on passing their appropriate examinations, the designation should be "Qualified Nurse."
3. A substantial number of nurses should receive further training in order to qualify them for positions of ward sister and higher. The appropriate designations to be settled later.

The proposal that every nurse should spend some time with chronic patients is particularly valuable, for it is precisely where the doctor and surgeon can do least that the nurse can do most. She should be encouraged to recognise and use her important opportunities for improving our care of such patients.

DR. T. WATTS EDEN, consulting obstetric physician to Charing Cross Hospital, and consulting surgeon to Queen Charlotte's Hospital and the Chelsea Hospital for Women, died on Sept. 22 at the age of 83.

---

[1] Kellgren, J. H. *Clin. Sci.* 1939, 4, 35.

[1] Sept. 6, p. 693.

parable methods and represent the nutritive value of food at the same stage in the flow from the farm to the mouth of the consumer. Most of the data now available on the nutritive value of foods refer to products as brought into the household (retail level) and provide information on the proportion of inedible material and the moisture content and nutritive value of the edible portion at this stage. The nutrient content of the edible portion may be considerably higher than that of the same portion of food "as eaten," because of waste and nutritive losses—both visible and invisible—during household storage, preparation, and serving of foods. Data on the composition of food as eaten will be increasingly necessary as correlations are sought between the results of dietary surveys and appraisals of the nutritional status of individuals and population groups. Accordingly the nutrition committee recommended that F.A.O. should arrange for joint consultation of experts in nutrition and food statistics from various countries who should develop the principles on which average food-composition figures used by individual countries should be based, and explore the means whereby comparability of data for international use can be attained, including, if necessary, the revision of tables now used for this purpose.

UTILISATION OF CEREALS

In addition to the study of the preparation of cereals recommended by the standing advisory committee, the nutrition committee draws attention to a broader aspect of the question: the utilisation of cereals, cereal products, and other plant products as human food or animal feeding-stuffs in such a manner that the nutritional needs of the population shall be best met. The best method of utilisation will differ in various countries, depending on the nutritive value of the cereals and products in question, the efficiency of their conversion by animals into human food, the relative cost of plant and animal products and their acceptability to the consumer, and the nutritive value of the diet of the population, particularly of the low-income groups. The committee accordingly recommended that F.A.O. should study the best utilisation of plant products for human consumption, either directly or through the animal; and the most economical and satisfactory balance between the production of meat and milk and between poultry-meat and eggs. Such studies would assist governments to plan their food policies so that food-production would be adapted to the physiological requirements of the people.

Rapid progress has been made in recent years in the chemical and microbial synthesis of foods and nutrients, such as yeast, fats, and vitamins. It is highly important that synthetic processes which may contribute to the improvement of nutrition and the alleviation of food shortage and dietary deficiency should be investigated and, if found advisable, their development stimulated. The committee heard a report from a representative of the forestry committee on the possibility of obtaining food by the saccharification of wood, and considered that the question of using saccharified wood for the production of food yeast should be further explored.

The committee pointed out that the national nutrition organisations recommended by the standing committee must be adapted to the governmental machinery of each country. Countries which contain a number of component units, such as federated states or self-governing communities, are urged to establish a central representative nutritional organisation. It recorded its opinion that the scientific evidence at present available does not indicate that, given similar environmental conditions, the physiological requirements of food for optimal growth, health, and physical efficiency are different for the peoples in the various parts of the world. It stressed the urgency of investigating food-supply targets.

The conference accepted both reports and passed them to the secretariat for action. The immense amount of correspondence, digestion, recording, and circulation which they involve is only a fraction of the whole work of the permanent staff of F.A.O.

THE OUTLOOK

An observer cannot help asking to what extent, when these voluminous surveys and advisory documents come into the hands of governments and other bodies in various parts of the world, their precepts will be put into practice, and how much of them will be neglected or suppressed. Though some of the less controversial advice may be followed, what weight will they carry when they conflict with political tendencies and commercial or national interests? Though the secretariat has done wonders in a short time, this vast programme of work must necessarily take years to execute. Even the World Food Board, the urgent need for which is admitted by all, cannot possibly under the most favourable conditions come into activity before next summer, and if the blue-print of the preparatory commission excites substantial controversy, its establishment must be correspondingly delayed. World events already move with dreadful speed, and that speed is accelerating. The obvious danger is that they will outstrip the organisation's good intentions and heroic work.

BRITISH-SWISS MEDICAL CONFERENCE

(*Concluded from p. 431*)

PHYSIOLOGY OF THE KIDNEY IN INFANCY

Prof. R. A. McCance (Cambridge) said that before birth the internal environment can be satisfactorily regulated by the placenta; indeed babies, normally developed in other ways, may be born with functionless urinary tracts. Little is known about the function of the kidney before birth; but it has been proved that the kidney of the newborn infant does not immediately assume all the functions it will perform in later life. The non-protein nitrogen of the blood may be higher for a few days after birth than later, and the uric acid in particular is raised. The serum shows signs of acidosis and may contain very high concentrations of potassium. In infants under 3 months, as in other young mammals, water is excreted less freely than at a later age. After the age of 1–2 years the urea-clearances of children are of the same magnitude as those of adults. A baby's urine is never highly concentrated; in the first few days of life the specific gravity averages 1012–1015, and the osmotic pressure 450 milli-osmols per litre, and in the later weeks and months the urine is usually very dilute. Even when an infant aged 14 days is deprived of water and the urine volume falls, concentrated urine is not normally produced; nor is the infant's normal dilute urine concentrated by injections of posterior pituitary hormone. It has been demonstrated, however, that a hypertonic urine is excreted, even by premature infants, if the salt-intake is sufficiently increased; these hypertonic urines are not a sign of good renal function.

Infants respond to the intravenous injection of sodium chloride (1 g. per kg. body-weight in 10% solution) and the oral administration of urea (1·7 g. per kg. body-weight with a minimum of water) by showing a moderate diuresis, a rise in the urinary osmotic pressure, and (despite this) a poor elimination of the test dose; the responses are obviously complicated, but it is clear that the normal infant's kidney can be very ineffective in the early days of life. In babies the glomerular filtration-rate is less than half that in adults; in the human infant, as in some other mammals, the rate depends on hydration, and quite mild dehydration may cause gross abnormalities in the serum chemistry, so that renal damage may then be erroneously diagnosed. Urea-clearances of infants in the first 14 days of life are far below those of adults when compared on the basis of surface area; on the whole the clearances probably vary with the minute volumes of the urine. The clearances approach adult level towards the end of the first year. These findings are supported histologically by the tall columnar cells which cover the glomerular tuft in fœtal life; these cells prove an effective barrier to ultrafiltration and are replaced by the thin pavement epithelium found in adult life. The excretion of diodone has recently been found to be very low in babies a few days old, and the creatinine clearances to be no higher than the inulin clearances. The ability to form and excrete ammonia, however, seems to be fully developed at birth.

Sodium, potassium, and chloride clearances are all lower in the infant, and especially the premature infant, an in the adult, which explains the premature infant's bility to œdema ; thus the premature infant should t be given much sodium chloride. The administration 0·9% saline as a source of fluid for a baby is bad erapy, since it presents the kidney with the task of creting a hypertonic solution—a task it can perform ly if the serum has already become grossly abnormal.

HIGH ALTITUDE IN THE TREATMENT OF TUBERCULOSIS

Dr. J. E. **Wolf** (Davos) regretted that the development of collapse therapy has led to a certain neglect of limatic treatment at altitudes of 4000–6000 feet. limatic treatment can plainly never completely replace urgical collapse therapy, particularly for the cavitating orm ; indeed high-altitude treatment increases the scope f surgery, since the patient may be made fit for collapse herapy by first having this conservative treatment. Recent statistics have shown the advantages of continuing both methods. Tuberculosis must be treated as a general disease with local manifestations. The mechanism by which high altitude helps to increase immunity is not clear: a mountain climate, though it stimulates body metabolism, also has a certain sedative action ; it has, moreover, a stimulating psychological effect.

Four climatic factors benefit the body's biological reactions: (1) diminution of atmospheric pressure ; (2) ultraviolet radiation ; (3) dryness of the air : and (4) diminution of the cooling power. The metabolism of respiration, circulation, and hæmopoiesis are certainly stimulated ; but there is evidence that pathologically increased metabolism—for example, in Graves's disease —is reduced at altitudes of 4000–6000 feet. Similarly the increased basal metabolism sometimes associated with tuberculosis is reduced at the same time as the increased blood-sedimentation rate and blood-globulin are lowered. It has also been shown that thyroxine injected into animals at high altitudes has only a quarter to a tenth of the effect that it has in the lowlands. The influence of altered vitamin metabolism must also be considered ; at high altitudes the blood-cholesterol increases, no doubt because of the intense ultraviolet radiation. When the blood-cholesterol rises there is an associated increase in the blood vitamin A. Both vitamins influence tuberculosis ; when vitamin A is deficient, the incidence of infection rises. At Davos it has been found in tuberculous patients that the blood vitamin A is decreased, the diminution varying with the gravity of the infection. It has also been shown that in the first few weeks after the change to a high altitude the vitamin A and D values increase together, even with cavitating disease, provided there is still a possibility of reaction. Some of the benefit from high altitude may be derived from its effect on the vegetative nervous system and from its encouragement of blood acidosis, in place of the alkalosis usually associated with tuberculosis.

The clinical results of high-altitude treatment have shown that it is strongly indicated in almost all forms of surgical tuberculosis. With pulmonary tuberculosis cases must be more carefully selected ; the treatment should not be adopted where the general condition is rossly impaired or the lung-area greatly reduced. All ther forms and stages of pulmonary tuberculosis are, enerally speaking, suitable for the treatment ; it is sometimes contended that the exudative forms should not e submitted to high altitudes, but in Dr. Wolf's view his is a mistake.

CELLULAR ADAPTATION TO EFFORT, ALTITUDE, AND OXYGEN DEFICIENCY

Prof. **Alfredo Vannotti** (Lausanne) pointed out that the effects of severe muscular effort and exposure to high altitudes are, in most respects, the same. The muscle persistently submitted to effort reacts by dilatation of reserve capillaries, the formation of anastomoses, and later possibly the formation of new capillaries ; this capillary adaptation is probably related to effort-acidosis. The myoglobin content in muscles submitted o 2–3 weeks' daily faradic stimulation is 10–35% more han in control muscles. It is now held that cellular espiration is regulated by two catalytic systems. One, made up of pigments based on hæmins, activates the arterial oxygen ; while the other is based on the activity of hydrogen transporters, the deshydrases, and is largely built up from the vitamins of the B group. With acute effort the muscle-content of dissociated iron increases, while with chronic effort there is a rise in muscle oxydase, myoglobin, and cytochrome C. With acute effort there is increased utilisation in the muscle of aneurine, riboflavine, and nicotinic acid ; but when hypertrophy ensues from chronic effort, there is a rise in the muscle content not only of myoglobin but of oxydase, cytochrome, active iron, and vitamins of the B group.

Ascent to high altitudes results immediately in a temporary increase in red blood corpuscles, attributed by Barcroft to splenic contraction ; then often the number of red cells falls rapidly, apparently through hæmolysis. Regeneration follows, with reticulocytosis and the formation of macrocytic red cells, rich in iron. Hæmoglobin and more especially myoglobin levels continually rise ; but whereas hæmoglobin has been observed to be formed with radioactive iron 6–8 days after injection, myoglobin and cytochrome are not synthesised with it until after 3–4 weeks. The organism's adaptation to high altitudes is thus slow ; the initial hæmolysis can be attributed to an attempt to mobilise iron for the rapid synthesis of cellular hæmins. With stay at high altitudes the spleen enlarges and there is some hypertrophy of the adrenals, especially of the adrenal cortex.

AMPUTATIONS

Mr. **George Perkins** (London) said that to satisfy the needs of the limb-maker it may be necessary to perform two operations—a provisional amputation followed later by a definitive one. The provisional amputation should be performed as low as possible, since the wound will probably not heal without infection ; there is no need to go above the level of existing infection. The technique does not differ from that in the definitive operation, except that the deep fascia and skin are not sutured. Healing is quicker if the skin-edges are sewn together for 2 cm. in the centre so as to cover the raw end of the bone ; but even this partial closure may not be safe with recent infection. For the definitive amputation primary healing should, ideally, be assured ; but it may be necessary to accept the risk of infection from a terminal ulcer. Experience from the first world war has shown that end-bearing stumps do not last ; the circulation in long stumps, moreover, often becomes defective. The sites of election now favoured by the Ministry of Pensions' surgeons are below or above the elbow, and below or above the knee. The short stump, though desirable, must be long enough to remain inside the socket of the prosthesis when the joint above is placed at a right-angle, and long enough to contain the insertion of the muscles that control the joint. A below-knee stump should measure 10–14 cm. from the knee-joint to the end of the tibia, and an above-knee stump 28 cm. from the top of the great trochanter to the end of the femur. At Roehampton the Syme amputation has been condemned, owing to the difficulty of fitting a comfortable prosthesis, which in any case is unwieldy compared with that fitted after a below-knee amputation. The optimum length for a below-elbow stump is 18 cm., measured from the tip of the olecranon to the end of the ulna, and for an above-elbow stump 20 cm., measured from the acromion process to the end of the humerus. The technique for definitive amputation is based on two considerations—the operation is performed by all manner of surgeons, and the needs of the limb-fitting surgeon must be met. The ideal criteria for the stump are : (1) the scar is not exposed to pressure ; (2) the scar is not adherent ; (3) the skin is not infolded ; (4) there is no redundant soft tissue ; (5) there is no projecting spur of bone ; (6) the stump is not tender ; and (7) the wound heals by first intention. After the operation the limb must be prepared to receive the prosthesis by shaping the stump, strengthening the muscles, regaining movement at the joint above, and reconnecting the brain to the stump. Finally, the patient must be taught to use the prosthesis.

CAROTID LIGATION IN INTRACRANIAL ANEURYSM

Prof. H. **Krayenbühl** (Zürich) emphasised the differences of opinion on the safety of carotid ligation. He has undertaken the operation in 35 patients, ligating in each case the common and internal carotid arteries, with more or less extensive periarterial sympathectomy ;

usually the artery has been compressed by hand for 20 minutes on the day before operation. Recurrent subarachnoid hæmorrhage has been the most common indication for operation. The results with infra- and supra-clinoid arteriovenous aneurysms have been uniformly good. Of 20 patients submitted to operation for bleeding supraclinoid saccular aneurysm, 6 died; among the 24 patients with saccular infra- and supra-clinoid aneurysm, postoperative flaccid hemiparesis has occurred in 4; but in 3 of these the disturbance has cleared almost completely.

PRIMITIVE TUBERCULOSIS, PRIMARY INFECTION, AND "PREMUNITION"

Prof. E. **Grasset** (Geneva) recalled that tuberculosis is seen in virgin stocks in its original uncomplicated forms. Primitive stocks may be attacked by acute infection at any age; indeed its spread may assume the form of an epidemic. Usually this type of infection results in early death. It may be spread by the lymphatic system from a primary focus in the lung; or the lymph-glands may be infected. In other patients the primary focus in the lung is the principal lesion, resulting in rapidly progressive pulmonary disease, and terminating in caseous bronchopneumonia or secondarily disseminated pneumonia. In some the spread of infection may be temporarily checked in the tracheobronchial lymph-glands. Pulmonary infection can be evaluated only by radiography; quite advanced lesions may be associated with few symptoms and no signs on auscultation, a good general condition, and a negative sputum. The lesion sometimes spreads through the lung in a compact mass; but it may spread rapidly in wide zones of one or more lobes. In children, and in some adults, the tracheobronchial lymph-glands are greatly enlarged, and the submaxillary and cervical glands may be grossly swollen and tender; in other cases all lymphatic glands are affected. After several weeks of this first phase, the infection enters a new and dramatic stage, with a gradual rise of temperature or sudden rigors and profound toxæmia. The picture becomes more clearly one of pulmonary infection, with cough and increasing expectoration; and a lobar or broncho-pneumonia may be simulated by the profuse, often bloodstained sputum, which, however, contains numerous tubercle bacilli. With rapid spread and cavitation, the condition deteriorates rapidly and the patient may die within 3 months, death often resulting from repeated or massive hæmoptysis and occasionally from meningitis. Necropsy shows that the lesions are mainly exudative with little or no fibrosis; in the same lung there may be different forms, such as massive caseous pneumonia in one lobe and fine nodules in the other. Elsewhere, as in the spleen, similar caseating lesions are found; and the larynx, pharynx, and intestinal tract may be ulcerated. This process is to some extent comparable to the juvenile type of infection seen after primary infection in some European children. In Europe today the acute, rapidly fatal, exudative type of lesion is unexpectedly common among the war-stricken populations. The best hope of control lies in "premunition" with B.C.G. vaccine or the vole-bacillus vaccine of Wells.

ARTERIAL INJURIES

Mr. J. J. **Mason Brown** (Edinburgh) divided arterial injuries into those that arise indirectly from a missile passing through nearby tissues, with arterial contusion and traumatic arterial spasm; and those in which the vessel is wounded directly by the projectile. The purpose of treatment is to restore the peripheral circulation, or, if this is impossible, to promote the development of a collateral circulation. Moreover, the limb must be so placed as to minimise the effects of ischæmia while the blood-supply is still depleted. The lumen may be restored by vein grafts or artificial cannulæ, followed by heparinisation. For success the circulation must be restored soon after the injury; later restoration may result in fulminating toxæmia through the absorption of products of disordered metabolism from the previously ischæmic limb. It should be realised that, though the peripheral pulses may be impalpable, there may still be sufficient flow of blood through the injured vessel to maintain the limb's nutrition until collateral circulation has developed. Primary surgery will abruptly interrupt the circulation; initial treatment should, wherever practicable, be conservative, to allow time for the development of collateral circulation, though a traumatic aneurysm often develops. The type of operation must depend on an assessment of the condition discovered at the operation; simultaneous ligation of the accompanying vein should be undertaken in primary surgery or in operations performed before the collateral circulation is established. Sympathectomy or sympathetic block, though of value in emergency ligations, is unnecessary when the collateral circulation is established. With false aneurysms hæmorrhage at operation should be controlled by a tourniquet; but in operations on aneurysmal varices no tourniquet should be used. When a tourniquet cannot be used it is important to gain control of the artery above and below the lesion. An intravenous drip should be set up before the operation is begun, and fresh blood should be at hand Secondary hæmorrhage, thanks to the sulphonamides and penicillin, is now a rare complication. After operation the limb should be placed about 6 in. below the heart-level and constricting bandages should be avoided; a sterile towel is a suitable covering. The limb can be exposed to room temperature. Venous stasis can be avoided by raising the head of the bed. Care of the skin is essential.

EXPERIMENTAL DIABETES MELLITUS

Prof. F. G. **Young**, D.SC. (London), said that the central problem of the cause of diabetes remains unsolved. The effects of pancreatectomy on carbohydrate metabolism are much more pronounced in carnivorous than non-carnivorous animals; the resultant diabetes can always be controlled by insulin. The influence of the pituitary gland is exerted largely by the secretions of its anterior part; but the posterior lobe also exerts a significant, though ill-defined, influence on carbohydrate metabolism. It is possible that the posterior pituitary secretion acts by influencing the secretions of the anterior part in the same way as adrenaline affects the adrenal cortical secretion. The diabetic condition in the dog during continued administration of anterior pituitary extract differs from that following pancreatectomy in that it is extremely unresponsive to insulin and is associated with increase in body-weight and nitrogen-retention moreover, the liver glycogen is high rather than low. There is experimental evidence of an antagonistic action between insulin and anterior pituitary extract. In dogs a permanent or so-called metahypophyseal diabetes has been produced by large amounts of anterior pituitary hormone; here irreparable damage is done to the insulin-secreting mechanism of the islets of Langerhans owing almost certainly to over-work under the influence of the pituitary extract. The growth-promoting factor of the anterior pituitary also inhibits carbohydrate oxidation Diabetes can be produced by the intravenous injection of alloxan, which causes acute necrosis of the islets of Langerhans, possibly through over-work exhaustion. Dietetic experiments suggest that the major cause of diabetic ketosis is a high-protein intake of meat rather than fat. Anterior pituitary extract occasionally stimulates regeneration of the insulin-secreting cells, but it is not yet possible to apply this therapeutically. The effect of œstrogen has been tried, in view of its known capacity to depress the gonadotropic factors of the anterior pituitary; œstrogen is, in fact, effective in alleviating postmenopausal diabetes, but there is no evidence that it exerts a direct action or that the action is mediated by the anterior pituitary.

Human diabetes is not a single syndrome with one cause. Some hold that the diabetic diathesis is inherited as a recessive mendelian character, and that the incidence of the condition has risen since the latent islet defect was revealed, because of the opportunities for consistent over-eating under conditions of modern civilisation. The anterior pituitary is almost certainly concerned in the origin of some cases; under certain conditions other glands, including the adrenals and the thyroid, may be implicated.

EXPERIMENTAL RADIOTHERAPEUTICS

Dr. J. S. **Mitchell** (Cambridge) ascribed recent additions to our knowledge of the therapeutic action of X and gamma radiations largely to the influence of cytology and cytochemistry, genetics, and radioactive tracer methods. There is now a better understanding of the ignificance of chromosome breakage and of the dependence of the biological efficiency of different radiations on specific ionisation. The therapeutic possibilities of high-energy (20–50 Mev) beta and gamma radiations in the treatment of cancer and related diseases should be more closely examined. At present the 30 Mev betatron appears to be the most suitable instrument for application in radiotherapy as a source of high-energy gamma radiation. The advances which led to the atomic bomb provide a new way of preparing large amounts of radioactive isotopes which should become widely used in medicine as: (1) radioactive tracers for the study of metabolic processes and in pharmacological investigations: (2) artificial gamma-ray sources in radiotherapy; and (3) agents such as P^{32} and I^{131} with therapeutic possibilities depending on the selective concentration of the radioactivity of suitable isotopes in particular cells and tissues. Hevesy, using radiophosphorus (P^{32}) as a tracer, showed that the synthesis of thymonucleic acid is inhibited by therapeutic doses of X irradiation, thus providing convincing confirmation of previous work using ultraviolet photomicrography, and the Feulgen reaction. Great caution must be exercised before any radioactive material is introduced into patients on account of the possible risk of long-term deleterious effects. The most promising substitute for adium is now thought to be radiocobalt (Co^{60}), with a half-life of 5·3 years. Of the selectively absorbed adioactive isotopes, P^{32} and I^{131} may prove the most useful in therapeutics: interesting results have been reported with P^{32} in the palliative treatment of chronic myeloid and lymphatic leukæmia and lymphosarcoma, and in polycythæmia. The value of fast neutron beam therapy in cancer and allied diseases is still an open question; evidence is accumulating to indicate that the biological action of fast neutrons differs in some ways from that of X and gamma radiations.

NATIONAL HEALTH SERVICE

A SPEECH BY MR. BEVAN

ADDRESSING the Society of Medical Officers of Health at their annual luncheon in London on Sept. 20, Mr. ANEURIN BEVAN, Minister of Health, said that though the armies were still arrayed on the battlefield of the National Health Service Bill they were becoming, he hoped, increasingly listless. All must unite to carry out whatever Parliament finally decided; any other course was anarchy. When the Bill became law the main task would begin—the administrative task, so much harder than the legislative. It would be impossible to frame regulations properly without the help of representatives of the various branches of the medical profession. His own purpose had been to follow with fidelity Lord Dawson's principle—to create an apparatus of medicine and leave the profession to exercise it in freedom and independence. Parliament must create the apparatus but it was for the profession to decide how to use it.

By medical officers of health, Mr. Bevan continued, the Bill had been criticised because it put hospital midwifery under the regional hospital boards while domiciliary midwifery remained under the *local authority* —an arrangement described as dichotomy. But all the serious difficulties of incoördination in the past had arisen because the hospitals had been owned by different groups. Doctors would in future move quite freely between hospitals and clinics. The M.O.H. and the hospital doctor must in future join fully in their work, having no occasion for jealousy. The unity of the scheme was determined by the right of the individual citizen to the use of all services of whatever kind, and the difficulties raised, which were theoretical and slightly pedantic, would in practice fall to the ground. "We are now facing," said Mr. Bevan, "a very critical year," and he wanted to make all possible use of the great experience of health workers. One of the great dangers was over-centralisation, and the more decentralisation could be arranged, the better for the service.

In conclusion the Minister defied anyone to point to any country more ambitiously striving to raise the standards of life of the citizen. In every direction there was in this country a renaissance. "I believe that we shall win our way through, but there is a frightful shortage of every kind of worker." This shortage made it essential to have complete coöperation between all engaged in the same task, and he appealed to medical officers of health as experts in that kind of coöperation.

Replying as president to Mr. Bevan's toast of The Society, Prof. J. JOHNSTONE JERVIS (Leeds) said that the Bill was not perfect: no legal instrument was perfect. Nevertheless it was incontestably the greatest thing that had been done in social medicine in any age or country. It should be given a fair chance to justify itself, and nothing was to be gained by adopting a hostile attitude. "We and our colleagues may be relied upon to play the part allotted to us in an earnest desire to carry it to a successful issue." On the eve of his retirement, however, Prof. Johnstone Jervis wished to pay a tribute to "a very great English institution"—local government. And he could not but deplore the present tendency of Government departments to encroach on the province of local authorities, the latest example being in the National Health Service Bill. If the health services of this country had today attained a high degree of perfection the credit was largely due to the inspiration, enterprise, and hard work of local authorities. Local government was the keystone of the arch of democracy. However good and effective might be the new authorities set up under the Bill, they could not replace the present local authorities, and he prophesied that in the course of years they would be replaced by local authorities purged of their imperfections. If he might presume to advise the Minister—head of what was once the Local Government Board—it would be to expand, strengthen, and maintain the powers of local government.

SCHOOLING FOR THE SUBNORMAL CHILD

WHAT CAN BE DONE

HANDICAPPED children need favourable conditions if they are to develop their abilities to the full. Special schools provide for children with serious disabilities, but for others special arrangements must be made in ordinary schools. In answer to the questions often asked by authorities who have to make such arrangements, the Ministry of Education have published a useful pamphlet[1] explaining what kinds of children need special educational treatment, how they should be selected, the probable numbers, and the results to be expected, besides giving advice on the arrangement of classes and the qualifications of teachers.

PHYSICAL DEFECTS

Children who may need special treatment are the blind (0·2–0·3 per 1000 pupils) or partly sighted (1 per 1000), the deaf (0·7–1 per 1000) or partly deaf (1 per 1000 upwards), the delicate (1–2%), the diabetic, the educationally subnormal (10%), the epileptic (0·2 per 1000), the maladjusted (about 1%), the physically handicapped (5–8 per 1000), and those with speech defects (1·5–3%).

At any time after the child is two years old the parents may ask to have him examined to see whether he is going to need special educational treatment; the authority is bound to have this done, and to provide special education if the child needs it and the parents wish it. The child need not be attending any school when the request is made. In some cases the earlier special treatment or training is begun the better. Many blind and deaf children between 2 and 5 are already in nursery schools or departments for the blind or deaf, and the decrease of crippling among children of school age is largely due to orthopædic treatment given in the early years. Children seriously disabled by blindness, deafness, epilepsy, aphasia, or physical handicaps can always be given places in special schools. Partly sighted children, if they can benefit from ordinary classes in primary or secondary schools, or in open-air schools, should sit at the front in a good light, and use extra-large paper and soft black pencils. Experiments on lenses to magnify ordinary print are now being made. Many partly deaf children can be given a chance in ordinary schools for six months to a year; if they fail to follow what is said in ordinary school situations and if their own enunciation is not clear and fails to improve they can then go to a special school. Advice on their progress should be sought from an educational clinic for the deaf, or from the nearest deaf school. The education authority should provide courses in lip-reading, and if necessary in speech improvement, for such children, who may be collected for the purpose in groups of 5–10 for an hour twice weekly. Where no teacher can be found for a class such children may perhaps be sent for a term to a boarding-school for the partly deaf, to take an intensive course in lip-reading.

---

[1] Special Educational Treatment. Ministry of Education Pamphlet no. 5. H.M. Stationery Office. Pp. 36. 9d.

Delicate children may need to rest on a stretcher-bed during the lunch-hour. Diabetic children, it is suggested, should live in hostels, under medical and nursing supervision, where their diet can be regulated and they can be taught the reasons for the restrictions placed on it; teachers could report at once to the hostel if a child developed symptoms in school. Large authorities and voluntary bodies are asked to establish such hostels. Aphasic children are rare, but need special schooling; at present they usually have to go to deaf schools for lack of a more suitable place. Children with speech defects should attend classes twice a week, held by a speech therapist working in the school health service.

THE BACKWARD

By far the largest problem is presented by educationally subnormal children, who form 10% of the school population. Under the new Education Act it is not necessary to decide what has caused a child to be backward before giving him educational treatment: that can be discovered during the process of educating him. Children with an intelligence quotient below 55 cannot be educated at an ordinary school; and backward children who are detrimental to the education of others in the class should not be retained on sentimental grounds, but should go to special schools. Thus a steady stable child with an intelligence quotient of 70 may get on all right in the ordinary class, while a nervous child of similar grade might be better with the support of a special school. If there are enough subnormal children in the school they may be grouped in a class; or a class drawn from a group of schools might be arranged, under a teacher who believes in the value of the work.

The maladjusted child of normal intelligence needs the help of the child-guidance team, and local authorities should therefore make proper child-guidance arrangements, or at all events employ an educational psychologist. Sometimes a child can continue to go to his own school while attending the child-guidance centre, or sometimes he will profit by a fresh start in a neighbouring school. Others, whose maladjustment arises in the home, may need to be boarded out with foster parents, or grouped in hostels while still attending ordinary schools. Others again may benefit most from a boarding-school for maladjusted children. Day schools for such children have been established in at least two areas, and have given promising results.

THE TEACHER

The pamphlet ends with a clear-sighted note on the qualities to be sought in teachers of children needing special education. They must not undertake the work to indulge their own maternal and compassionate feelings. The life of the handicapped is hard, and these children must be helped to be self-reliant, optimistic, hard-working, and as far as possible skilled. Their teachers must bring them emotional normality as a pattern, and must be capable of making the most of each child's abilities.

MR. T. F. DIXON, PH.D., has been appointed professor of biochemistry in the Royal College of Medicine, Bagdad.

MODELS OF THE FOOT.—The Foot Health Educational Bureau has prepared a series of models of healthy feet at all ages from infancy to the adult, and is prepared to supply casts of these at a reasonable cost. They are likely to be of considerable value as visible standards of the normal to those concerned with the preventive care of the feet—doctors and nurses in child-welfare clinics and factory health services, physiotherapists, physical training experts, and others to whom the earliest stages of foot deformity are the most important. The address of the bureau is 90, Ebury Street, London, S.W.1.

In England Now

A Running Commentary by Peripatetic Correspondent

PERHAPS this business of German measles in the third month of pregnancy being related to congenital defect which are common but fail to be obvious because o the lapse of time between the initial and consequent conditions. With a view to scooping a Nobel prize with an original generalisation on these lines, I composed myself for half an hour's research in my armchair. It was logical, I thought, to assume that the greater the time interval, the more likely would it be for a Great Generalisation to be missed. So I began by looking for adult disorders originating from events in infancy. I chucked this line of thought when it dawned on me after five minutes that much of the field had already been scooped by a bloke called Freud. After a few seconds of despondency my courage returned. I would out-Freud Freud. I would go further back still.

Picture if you can an ovum, a fresh and blooming débutante making her one and only appearance in utero. Alas, however, she differs from other protozoa in that she cannot split in the middle on her own and can only achieve immortality by the sacrifice of her unicellularity. Her chances of doing this are limited to the next forty-eight hours or so. If she has no spermatozoic suitors in that time, then she's had it. Now picture if you can an ovum in her forty-seventh hour. Her protoplasm is pickled, her genes are jiggered, her mitochondria are moth-eaten, and her cell-membranes are slipping up. Altogether, as far as ova go, she's a hag. Then suddenly there is a lashing of tails in the middle distance and a crowd of the boys come charging up the slope. She gasps with relief. She shrieks with joy. She grasps the winner by the scruff of his neck before he can have a chance to see what he's landed with and change his mind. Perhaps it is in such a union that originate those placebos and excuses which are yet undeniable truths—the "constitutional weakness," the "constitutional instability," the "constitutional predisposition."

Yes—I suppose it is rather far-fetched. And anyway, —don't you have to make a speech in German when they give you a Nobel prize? Awful fag having to learn German just for that.

* * *

The outstanding impression from last week's conference in Basle is the kindliness of our Swiss hosts, springing from a keen sense of kinship. There are other memories: a drive along the road, divided only by the Rhine, to Rheinfelden, where Dr. Donald Hunter, somewh incongruously, spoke of industrial medicine; the clean ness of Swiss towns; the well-stocked shops; t 40-million-franc hospital, constructed during the wa and containing gadgets enough to delight a schoolbo mind for weeks; and the food. To most, the meal after Britain's austerity and unpolished cuisinerie, wa a natural attraction, though Switzerland, with tw meatless days a week and noticeable shortages in milk grain, and sugar, is not the land of superabundance whicl some have painted. There is, moreover, no excess o consumer goods, and those who plotted to carry off such treasures as coloured china found their way barred. I was pleasing to see in the shops many articles bran "*Made in England*," even though many of them are still unobtainable here. Visitors who did go shopping found some difficulty in distinguishing the 5 and 10 centime coins from the half-franc; the difference in texture and the serrated edge of the half-franc piece was little help to the uninitiated. Incidentally, why does Britain alone still adhere to the vast penny for a piece of such small denomination? Despite the smallness of the country, the dialect differs enormously between different places. In Zürich diction is rapid and clipped, while in Berne, as befits the centre of a large rural area, it is slow and sing-song. In Basle the speech is noticeably more elegant, and among the Swiss people the town has a reputation for mordant wit of which other cities stand in awe. But the canton spirit is strong, and the feeling is perhaps no deeper than that between Liverpool and Manchester or between Glasgow and Edinburgh. Certainly in Basle, as elsewhere, the visitor finds nothing but friendliness.

As, with regret, we turned our minds to packing for the homeward journey, we discussed with nervous trepidation the ways of British Customs officials. There were, we found, two schools of thought: according to one, they were wise men with all-seeing eyes, from which naught could be hid; the other contended that the Customs was fair game, and that much could be concealed by the wary traveller. As to which school I heeded—that concerns only myself and my bank manager.

* * *

The Very Senior Medical Officer (V.S.M.O.) was annoyed. One of the station medical officers under his jurisdiction had sent in a submission that married female auxiliaries were securing early release from the Service on the grounds of pregnancy when it was impossible to confirm or refute their claims on clinical grounds alone. The station medical officer contended that the certificates given by the private doctors of these women were valueless so early in pregnancy unless backed by biological tests, and that in any case such early discharge from the Service was not justified at a time of acute woman-power shortage. The V.S.M.O. did not agree; and he did not like the station medical officer. Perhaps his annoyance made him careless. He sent for the relevant orders and after consulting them wrote a minute: "I think that the provisions of Order XYZ are adequate to deal with these cases." The papers passed to the next staff officer, who took the trouble to verify the order reference and then, with a gleam in his eye, wrote that so far as he knew the apparatus mentioned in Order XYZ had never positively been implicated in these cases. When the V.S.M.O. received the papers back he sent again for the orders to find that he should have written "Order XZY" and not "Order XYZ," which bore the full title of *Portable Aiming Teacher*.

* * *

It was the twenty-third time that I had resolved to take up the piano seriously, but the first such occasion on which I realised why it is that concert pianists are invariably portrayed as highly strung, egocentric, temperamental, and generally difficult individuals. It is all a matter of hysterical dissociation. The essential of pianoforte technique is that the falx cerebri should act as an iron curtain, preventing one half of the brain knowing or caring too much about what is going on at the other side. My left hand knows all too well what my right hand is doing—and vice versa. Nor are they satisfied with each other's performance. Each is continually saying to the other, "No, my dear! This is how you should do it." Hence the chord-salad. But take a gross hysteric and put her at a piano. If she has the rudiments then the rest comes just as easily and much more pleasantly than automatic writing. Her bass and treble selves enjoy a glorious independence but watch each other sufficiently out of the corners of their eyes to avoid the effect of a completely split personality.

Tschaikovsky had to conduct clutching his beard for fear his head fell off. If I ever began to become at all proficient at the pianoforte my main preoccupation would be lest my cerebral hemispheres suddenly fell apart. However, I can shelve that worry till the twenty-fourth time.

* * *

The labels on the exhibits at the *Britain Can Make It* exhibition at the Victoria and Albert Museum omit the final despairing cry of the plum-stone prophecy, though they still tantalise the would-be purchaser with their degrees of availability—now, soon, later. All the same it will be worth waiting to have a kitchen tap whose washer can be changed without cutting off the water at the main, or a pair of transparent plastic slippers that will make Cinderella's look like clogs, or an electric toaster that even King Alfred could use. But life in the brave new world will have its own complexities. The ingenious combined stepladder, ironing board, and baby chair, for instance, may set as many problems as it solves, and it would take an experienced sleeper to attempt a night in the air-conditioned bed of the future with its dashboard for automatic temperature control. Twenty-four model rooms show us the homes, schoolrooms and offices of the future, and Mr. Nicolas Bentley's sketches introduce us to their inmates with such convincing detail that we find ourselves congratulating the railway engineer (formerly in the 8th Army and has a houseproud wife and five children), the young doctor (newly set up in practice, but studies social conditions and has a wife who likes outdoor sports and photography), and the middle-aged storeroom clerk (collects stamps, reads thrillers, and is a regular picture-goer) on having solved their housing problems so satisfactorily.

* * *

A radio speaker with a persistent cough can be infuriating to his audience, but they can always switch him off. The situation is much worse for the speaker himself; when he feels a tickling sensation starting in his throat he must go on speaking into the microphone, keep at the correct speed which has been thoroughly impressed on him at the rehearsal, follow his script, and all the time wonder just when the explosion will come. There is a switch on the table marked "Censor" which puts the speaker off the air. I had always imagined it was for interrupting anyone who transgressed the B.B.C. code and inserted a bawdy remark, but I now discover it is for the benefit of the cougher. He pauses at a suitable spot, presses the key, clears his throat satisfactorily, lets go the key, and proceeds hoping that the public is none the wiser. I do not like this technique myself, and having recently to broadcast with an irritating and persistent cough I relied on "syrup codein. phosph." This completely stopped the coughing and I strongly recommend it to others who are too frightened to use the censor switch.

Public Health

Standardisation of Death-rates

THE issue of the civil tables[1] completes, with the previous publication of the medical tables,[2] the Registrar-General's report on 1941. This was one of the most depressing years of the war and some of its depression is reflected in the figures: thus the birth-rate at 13·9 per 1000 was the lowest ever recorded, while the infant mortality of 60 per 1000 related live births was higher than any since 1933. To statisticians and medical officers of health, however, perhaps the main interest of the medical section lies in the introduction of the new method of standardising death-rates.

It has been customary to standardise the crude death-rate in order to take into account the change in the age-structure of the population by applying the age-specific death-rates in the year under review to the standard population of England and Wales in 1901. The use of such a standard population ensured that, in a comparison between two standardised death-rates, the differential effect of ageing of the population on the crude death-rate was neutralised; the influence of other agencies, such as epidemic and therapeutic innovations, on mortality was thus readily isolated. Unfortunately there are some residual difficulties even with this method. In long-range comparisons, for example, the rate of decline in the standardised death-rate will depend upon the actual population used as a standard: thus the decline in mortality from 1901 to 1939 may appear either as 50% if 1901 is used as a standard, or 38% if 1939 is used as the standard population. Similarly in comparing the mortality in more recent years, say between 1938 and 1939, even reversals of the trend of the standardised death-rate can be produced by changing the standard population from 1901 to 1939. It would be more realistic therefore in making such comparisons to use a modern population.

To combine this realism with some balancing of the divergent weighting effects of the population being examined and this new standard, it is proposed to calculate in future the comparative mortality index. The last available stable modern population—that of 1938—is used as one standard reference basis, the other being the particular year under review. The new standard population is made up by averaging, in each age and sex group, the numbers in each of these two populations so as to get a new standard midway between them. To

---

1. Registrar-General's Statistical Review of England and Wales for the Year 1941. Tables. Part II. Civil. H.M. Stationery Office. 1s.
2. Tables. Part I. Medical. H.M. Stationery Office. 5s.

this intermediate type of population are then applied the death-rates at ages of (*a*) the given year, and (*b*) 1938, to obtain by adding over the whole age scale the total number of expected deaths in this new standard population at these death-rates. The ratio of the expected deaths in the standard population at the death-rates of the given year to the similar total for the 1938 rates gives the comparative mortality index or C.M.I. The C.M.I. for any year can be compared with the previous one by dividing the former by the latter to obtain a "mortality ratio." Similarly a comparison between the standardised mortality for males and females, based on the average number of both exposed to risk, is given by the "male-female ratio." In this and succeeding reports these various indices and ratios will be given for long series of years so that the trends in mortality can be easily followed.

There are good reasons for these innovations, though they will doubtless cause acute headaches to D.P.H. students. Their practical value should become evident in future reports.

Infectious Disease in England and Wales

WEEK ENDED SEPT. 14

Notifications.—Smallpox, 0; scarlet fever, 791; whooping-cough, 1744; diphtheria, 255; paratyphoid, 33; typhoid, 17; measles (excluding rubella), 1213; pneumonia (primary or influenzal), 284; cerebrospinal fever, 28; poliomyelitis, 22; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 68; puerperal pyrexia, 100; ophthalmia neonatorum, 75. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Sept. 11 was 861. During the previous week the following cases were admitted: scarlet fever, 62; diphtheria, 20; measles, 20; whooping-cough, 45.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from an enteric fever, 3 (1) from measles, 10 (1) from whooping-cough, 5 (0) from diphtheria, 54 (3) from diarrhœa and enteritis under two years, and 2 (0) from influenza. The figures in parentheses are those for London itself.

Swindon reported the fatal case of an enteric fever. Liverpool had 3 deaths from whooping-cough and 7 from diarrhœa and enteritis.

The number of stillbirths notified during the week was 243 (corresponding to a rate of 26 per thousand total births), including 37 in London.

Medicine and the Law

The Nature of a Charity

A LEGAL training undoubtedly helps judges to decide an issue; but it may be a hindrance when they are obliged first to agree on what they are there to decide. In the case between the Commissioners of Inland Revenue and the National Anti-Vivisection Society, now published by the Research Defence Society,[1] it was agreed at every hearing that the benefits to men and animals of animal experiments have been great, and that the suppression of such experiments would end medical and scientific advances in many directions: but was this relevant? The society had claimed exemption from income-tax on the ground that they were a charitable body; and the commissioners had refused the claim on the ground that the society were not such a body.

A meeting of the Special Commissioners of Income Tax was held in December, 1943, to hear evidence from both sides for the purpose of an appeal to the High Court. Publications of the society were considered, and evidence was given by their director, Dr. R. Fielding-Ould. Testimony on the value of animal experiments was then taken from Major-General L. T. Poole, Sir Edward Mellanby, Dr. R. D. Lawrence, and half a dozen other medical authorities. In their decision, the commissioners, after discussing the possible benefit to morals and education from the society's efforts to abolish vivisection, declared that

> "... if we conceived it to be our function to determine the case on the footing of weighing against that assumed benefit the evidence given before us, and of forming a conclusion whether, on balance, the object of the society was for the public benefit, we should hold, on that evidence, that any assumed public benefit in the direction of the advancement of morals and education was far outweighed by the detriment to medical science and research and consequently to the public health which would result if the society succeeded in achieving its object, and that, on balance, the object of the society, so far from being for the public benefit, was gravely injurious thereto, with the result that the society could not be regarded as a charity."

But in 1895 two forerunners of the society were held (*In re Foveaux*) to be a charity within the legal definition of the word, and this finding—by Mr. Justice Chitty, as he was then—had never been overruled. The commissioners therefore decided that they were bound by the authorities to hold that the society were a charitable body, and to allow their claim.

When the case was heard in the High Court, however, in July, 1945, Mr. Justice Macnaghten held that the evidence proved that the society's main object was the total abolition of vivisection, and that "attainment of that object, so far from being beneficial, would be gravely injurious to the community." He therefore allowed the appeal of the revenue authorities, whereupon the society took the case to the Court of Appeal.

At the hearing in this court, in December, 1945, the judges disagreed. The Master of the Rolls held, with Mr. Justice Chitty in the case cited, that prevention of cruelty to animals is a charitable object, and that the society existed for the purpose of preventing a particular form of cruelty, namely vivisection.

> "... kindness and love towards animals," he said, "are virtues the cultivation of which is conducive to the moral advancement of humanity. I should be ashamed to hold otherwise. The proposition is not made untrue by the fact that human weakness or urgent human need persuades or compels individuals or the community at large to sacrifice the moral benefit. ... I should not care to find myself having to argue with anyone who regarded the practice of operations on living animals as anything better than a lamentable necessity."

In short, the moral value does not disappear merely because humanity has benefited by animal experiments, or because the end is thought to justify the means. He was for allowing the society's appeal.

Lord Justice MacKinnon took the opposite view. He felt that in 1895 Mr. Justice Chitty had failed to decide the very issue before him—"Has it been proved to me, by the evidence to which I have listened, that the purposes of these [two anti-vivisection] societies are beneficial to the community?" Though he held that "to be a charity there must be some public purpose, something tending to the benefit of the community," yet, when he came to give judgment, he said: "The intention [of these societies] is to benefit the community: whether, if they achieved their object, the community would in fact be benefited is a question on which I think the Court is not required to express an opinion." With this Lord Justice MacKinnon could not agree. The intentions of those who support such societies may indeed be charitable:

> "I readily assume that the motive which leads old women to make bequests to this society is concern for the dear dogs. As one who has more than once experienced the grief of losing a beloved spaniel, I can respect and applaud the motive: though I do not think my respect and applause can be expected when it becomes a matter of the dear guineapigs and the dear rats."

But the motive of those who provide the money is immaterial, since the opinion of a donor that a gift is for the public benefit does not make it so in law. He felt that, on Mr. Justice Chitty's reasoning, a society seeking to make the sale of rat-traps illegal, or a society designed to prohibit the sale of insecticides, would be equally charitable. He supported Mr. Justice Macnaghten's ruling, and thought the society's appeal should be dismissed with costs, a view with which Lord Justice Tucker agreed.

The appeal of the society was dismissed with costs, but they were given leave to appeal to the House of Lords. This final appeal has been lodged, but its date has not yet been fixed.

---

[1] *The Fight Against Disease*, 1946, 34, 1.

Letters to the Editor

DISCREPANT SALARIES

SIR,—I read with amazement the five advertisements rom the Middlesex County Council in your issue of ept. 14. In the three for physicians and one for a surgeon t general and tuberculosis hospitals the salary rose to 1800 and then to £2200 as a special grade. The other dvertisement was for a deputy medical superintendent n a mental hospital and the maximum was £850; yet he applicants for all the posts will be, or should be, of bout the same professional standing.

Every effort is now being made to unite psychiatry nd general medicine, but one of the essentials is an nlightened outlook on the part of employing authorities. When a county council which normally has a progressive nedical policy can only assess the value of the brain at ess than half that of the body surely something must be very wrong?

Netherne Hospital, Coulsdon, Surrey. E. CUNNINGHAM DAX.

RELATIONSHIP BETWEEN PRIMARY AND ADULT PULMONARY TUBERCULOSIS

SIR,—The disparagement of morbid-anatomical findings at the Tuberculosis Association's meeting (*Lancet*, Sept. 14, p. 382) cannot, I feel, be allowed to pass without comment. While it is true that a few odd post-mortem examinations, however carefully conducted, cannot solve the problem of the origin of phthisis, it is by morbid-anatomical research, and by it alone, that the actual changes initiating phthisis and their relationship to preceding tuberculous changes, can be demonstrated. Epidemiological and radiological surveys consciously or unconsciously refer to these changes and are of necessity based on their study and knowledge. There can therefore be no question of one method of approach being more "reliable" than the other or superior to it because of the larger number of suitable cases. The two methods are *complementary*.

Phthisis appears to develop from the primary lesion either within a *short* interval, by direct bronchogenic spread from a softening primary focus ("primary cavity"), or from small "subprimary" (probably blood-borne) foci, or else, after a *long* interval, by recrudescence. The former, more acute, development is usually seen in young adults, whereas recrudescence is observed in the elderly or middle-aged in whom a calcified (primary or early postprimary) focus may be found in a state of "atheromatous liquefaction" causing decomposition of the calcified material and a break-through into adjacent bronchi. It is the subsequent caseous bronchitis which in this type provides the "prephthisical" focus.

Central Middlesex County Hospital,
London, N.W.10. WALTER PAGEL.

GOOSE-SKIN REFLEX IN MALNUTRITION

SIR,—When I visited the orthopædic hospital at Siglap, Singapore, to study various signs of malnutrition, Captain D. J. D. Bell, who was in charge of the hospital, showed me a boy, aged about 10 years, in whom a goose-skin reflex of the abdomen could be produced. The boy had signs of riboflavine deficiency (circumcorneal proliferation of the capillaries and an enlarged magenta tongue), muscular weakness, and other somewhat indefinite signs of mild nerve degeneration, suggesting early beriberi. The skin of the abdomen appeared normal and felt smooth, and no enlarged glands could be seen raised above the surface; but, when the blunt end of a pencil or a finger-nail was drawn lightly over the skin, within a second or two there was well-marked goose skin. The glandular papules did not all appear at once but came up, a few at a time, in two or three seconds. In about half a minute the goose skin started to disappear, the papules fading away more or less in the order in which they had appeared. The skin of the other parts of the body did not show this phenomenon.

I have examined for this sign 111 hospital patients with various diseases. Among them were 14 cases of beriberi in men; in 3 of them the sign was positive. These 3 were early cases; all had mild paresis, and there was pain on pressure of the calves in 2 of them. The 11 negative cases were in later stages of beriberi, and only 1 of these had pain on pressure of the calves. I have found the sign in only 1 other case among these patients, a man with mild spastic paraplegia. This paraplegia was of much the same type as lathyrism and therefore probably of dietary origin due to deficiency of vitamins, aggravated by some toxic substance in the food. In support of this was the fact that his 9-year-old son was lying in the next bed with a more advanced spastic paraplegia. The son did not show the goose-skin reflex. Of the 5 patients showing this sign, all had one or more signs of deficiency of riboflavine, all had swollen fissured magenta tongues indented by the teeth, 2 had patches of superficial erosion of the tongue, and 3 had well-marked circumcorneal injection.

Beriberi is characterised by peripheral neuritis and various degrees of degeneration of other parts of the nervous system. The goose-skin reflex must be due to degeneration of the posterior part of the spinal cord; it cannot be due to peripheral neuritis.

The 3 adults with beriberi had patches of hyperkeratosis follicularis on the abdomen, but only a small proportion of the glands were affected, and these papular enlarged glands remained unaltered when the goose-skin reflex was produced in the unaffected glands.

The only other patients with lesions of the nervous system who have been examined for this sign were 2 with hemiplegia, but the reflex was not elicited.

Fulbourn, Cambs. LUCIUS NICHOLLS.

EFFECT OF PHOSPHATE ON CARBOHYDRATE ABSORPTION IN SPRUE

SIR,—Dr. Stannus (Sept. 21, p. 436) has misinterpreted our intentions. In our preliminary communication (1945, ii, 635) we gave details of experimental results which indicated that there was an upset in intestinal phosphorylation in sprue. In such short communications reviews of the literature are out of place and only essential references should be given. We referred to Verzar, whose pioneer work on phosphorylation was the basis of our research. The idea that intestinal phosphorylation might be retarded in sprue was not new when Dr. Stannus published his interesting essay on the disease. We found it already suggested in the extensive publications of Verzar and his colleagues[1] and in the more recent review on the ætiology of sprue by Leitner.[2] All these works were published before Dr. Stannus's paper.[3]

School of Tropical Medicine,
University of Liverpool. BRIAN MAEGRAITH.

PATENT MEDICINES

SIR,—Your leading article of August 24 discusses an old yet ever topical subject. Few will dispute the reasonableness of most of Mr. Linstead's "indictments," but the remedies he offers are somewhat cumbersome. To set up a new Whitehall machinery, with registers, boards, fees, collectors, &c., would put new burdens on the community without achieving the desired results. I suggest that the first aim should be to confine the sale of "patent" medicines to qualified chemists. The pharmacist is a trained person who knows when to refuse a ready-made medicine and when to tell a customer to seek a doctor's advice. One of the main rules of the Chemists' Friends Association, which you mention, is that proprietary remedies of its manufacturer members can be supplied only through qualified chemists. If the medical profession would give a helpful hand to an association such as this, only good could result—without official interference.

Gerrards Cross. S. BROOK.

WOMEN IN MEDICINE

SIR,—In regard to the proportion of women doctors remaining in practice, the figures quoted in your Students' Guide (August 31, p. 307) are misleading. The survey by the Medical Women's Federation was taken in 1944, at which time, I understood, all able-bodied women between certain ages were obliged to work full-time (or part-time if home ties were too great). Only those with full-time home duties were exempt.

London, S.W.12. VIVIAN M. USBORNE.

---

1. Verzar, F., McDougall, E. J. Absorption from the Intestine, London, 1946; Verzar, F., Laszt, L. *Biochem. Z.* 1935, 278, 396 (for example).
2. Leitner, Z. A. *Trop. Dis. Bull.* 1942, 39, 497.
3. *Trans. R. Soc. trop. Med. Hyg.* 1942, 36, 123.

PERNICIOUS ANÆMIA AND CARCINOMA OF THE ŒSOPHAGUS

SIR,—Nineteen years after the death sentence in pernicious anæmia (P.A.) was commuted to "liver for life" it is now becoming generally recognised that the patient with P.A. is more liable to gastric carcinoma than is his healthy neighbour.[1] The best examples of this concurrence seen here in the past few years were (1) a man with P.A. diagnosed by blood-count, barium meal, test-meal, &c., in July, 1938, who died, aged 37, in September, 1943, three months after laparotomy had revealed inoperable gastric carcinoma; and (2) a woman, first admitted to hospital with P.A. in October, 1933, who died in September, 1942, at the age of 39, after a short history of gastric upset; her neoplasm was proved by necropsy and histology. These two patients were considerably younger than in most of the recorded cases.

I have not been able to find any record of œsophageal cancer in a patient with P.A., and the following presumptive case is reported in the hope that others may look out for such cases.

A man, aged 49, was first sent to this department on March 31, 1938, by Dr. H. T. Cank, of Leyland, for a blood-count. He had had pneumonia in 1932 and 1933, and several attacks of "influenza" since, the last being a few weeks ago and attended by pain suggesting pleurisy. He had long been easily tired, had lost weight, and had recently noted soreness of the tip of his tongue.

His brother was known to the department as a case of P.A., having attended regularly since August 1, 1935, when he was 32 years old. Otherwise the family history was clear of anæmia and cancer.

Apart from clinical anæmia, physical examination was negative. Blood-count showed red cells 2,500,000 per c.mm., Hb 70% (Haldane), C.I. 1·4; white cells 7200 per c.mm. (differential count normal). The mean red-cell diameter was 8·2 μ (halometer).

After treatment with 'Campolon' the blood became normal by April 27, 1938. On a dose of 2 c.cm. every three or four weeks, blood-counts were normal in March and July, 1939. Patient was seen once in 1940, thrice in 1941, and the figures were normal in four counts in 1942 and three counts in 1943, when 'Anahæmin' was being given. A test-meal in November, 1941, showed a histamine-fast achlorhydria. In January, 1943, patient was in hospital for four weeks with a left lobar pneumonia. *He left hospital 17 lb. heavier than on admission.*

On Jan. 5, 1944, he was readmitted, complaining that for three months he had been regurgitating food about an hour after eating, and that for six weeks he had felt food stick at about the level of the mid-length of the sternum. Despite a good appetite he had lost much weight, and he had sternal pain radiating to the right axilla.

He was wasted, and the right pupil was larger than the left. Blood-count was normal. Radiography of barium swallow showed œsophageal obstruction at the level of the lower edge of the aortic arch (Dr. T. Harrison). *Hoarseness had now developed.* A Witzel's gastrostomy was done on Jan. 26, but patient died on Feb. 2. Permission for necropsy was refused.

I wish to thank Dr. A. W. Baker and Dr. F. B. Smith for permission to record this case.

R. T. COOKE.

Department of Pathology, Royal Infirmary, Preston.

PSYCHOANALYSIS IN THE NATIONAL HEALTH SERVICE

SIR,—Clause 1 (1) of the National Health Service Bill states: "It shall be the duty of the Minister . . . to promote . . . a comprehensive health service designed to secure improvement in the physical and mental health of the people . . . and the prevention, diagnosis, and treatment of illness . . ." Nevertheless, psychotherapeutic, and especially psychoanalytic, treatment cannot be generally provided since psychiatrists trained in psychotherapeutic methods are only available in numbers sufficient to cope with a minute proportion of the total need. The number of patients being treated by psychoanalysis is indeed small compared to the need, but the number is not insignificant. Psychoanalysis is relatively new, it is time-consuming, and it is costly. Its use in treatment and in research cannot now be successfully controverted. The situation after the passage of the new Bill will be that a branch of the profession will be able to cope with the psychoanalytic treatment of a few hundred patients at one time, and the therapy is one which is known to exist to many. Any Minister of Health would be embarrassed at having to make regulations designating priorities for treatment, and if the selection is left to the individual practitioner there is sure to be heartburning in his medical colleagues who refer him patients. If psychoanalysis is not accepted as a treatment to be provided under the Bill there will be justified resentment among patients who are advised such treatment. If psychoanalysis is accepted in any degree the vast needs for training will become apparent.

At present the official body organises training in psychoanalysis and psychoanalytic treatment under the auspices of a clinic at small fees or free, and arranges publication and library facilities. The present endowment and fees are such that slow development is likely to continue to be possible without State aid. Under the new Bill eventual organisation as a part, for example, of the British Postgraduate Medical Federation, might become possible. Under clause 16 (1) the Minister is able to aid research, and perhaps eventually psychoanalytic research might obtain State subsidy. Nevertheless, it seems to be inevitable, though unfortunate, that psychoanalytic therapy, training, and research will for a time run an independent course.

London S.W.7. W. CLIFFORD M. SCOTT.

DEATH AFTER CURARE

SIR,—With reference to your annotation of Sept. 21, too much discredit is being thrown on a drug which was not entirely responsible for this fatality. With a woman aged 70 years, surely a dose of 'Pentothal' of the magnitude of 1 gramme was more than sufficient on its own for the performance of an appendicectomy lasting 43 minutes; yet to this a dose of 'Intocostrin' of 9 c.cm. (equivalent to 27 mg. of *d*-tubocurarine chloride) was added.

Since pentothal and curare are synergic in action, seems strange that with these large doses no referenc was made to the necessity for controlled or assiste respiration during the operation; reliance seems to hav been placed more on 'Coramine' and 'Veritol' tha artificial ventilation of the lungs with oxygen whe *cyanosis was first noted.* Surely the cause of death wa prolonged *hypoxia,* with *toxæmia* as a secondary cause

May I add a rider that in all cases of gross respiratory depression an unobstructed airway must be ensured and controlled respiration performed before resort is made t respiratory stimulants.

London, S.W.1. E. ASQUITH.

SIR,—Your report on this case raises many issues c great importance. At a time when anæsthetists ar attempting to establish curare as a safe and useful dru it is very tragic that such a case should occur. Yet man useful lessons may be learnt from it. Apart from you report the case is unknown to me, and I assume that th facts as reported are correct.

(1) The wisdom of using a new and experimenta drug (I am aware some may question the epithet) o such a bad risk case appears to me doubtful in th extreme. It would be very useful if the opinions of m senior colleagues on this could be ventilated in yo columns. I use the term "experimental" deliberatel for there is a drug still used by some of us, known ether, which has been employed as an anæsthetic age for 100 years on many millions of cases. Any new dr which has been in use for only a few years on a fe thousand cases must, by comparison, be termed "exper mental."

This appears to me to be an important principle establish. In an evening paper recently an anæsthetist reported to have stated that in a certain fatal case cura was used as being the safest possible drug in the circu stances. Compared with ether, it is very doubtful curare could at present be correctly described as th safest possible drug in any circumstances. Before th value of any anæsthetic drug can be assessed it mu be used in hundreds of thousands of cases over a lo period. Some drugs have such obvious limitations th their value, or lack of it, is soon discovered. Othe of greater promise, require a longer trial. For examp yclopropane, which appeared at the outset to have such reat promise, required five years of trial before it could e said to have passed the experimental stage. Curare, which appears to be of even greater value than cyclopropane, will probably require an even longer trial. I hope that, unlike 'Pentothal,' it will not prove to be a drug "fatally easy" to administer.

---

[1] Leading article, *Lancet*, 1945, ii, 406.

(2) When we examine the dosage of drugs used in his case, it would appear that the coroner's verdict was charitable. An old lady of 70, suffering for two days from an acute abdominal infection, and with early peritonitis, was given morphine gr. $^{1}/_{4}$ and atropine gr. $^{1}/_{100}$. I would presume to say that the former drug was superfluous. This was followed by 1 g. of pentothal. In my opinion this was an excessive dose, even had nitrous oxide been the only additional anæsthetic to be given. With curare in a fit subject in first-class condition I personally hesitate to give more than half this dosage. Prescott, Organe, and Rowbotham (*Lancet*, July 20, p. 80) have pointed out the danger of giving two such respiratory depressants together in full dosage. The present case illustrates this danger. I am not surprised that the patient required continuous oxygen.

This was followed by 'Intocostrin' 9 c.cm.—180 units. Presumably this was given intravenously in a single dose. So far as I am aware, 100 units of this drug is regarded by authorities as a maximum single dose even in fit subjects. In any case, we are warned that in the very young, or the very old, or in bad risk cases, this dose must be considerably reduced. I hope that those who are more competent than myself to express an opinion will let us know in your columns whether this dosage should be regarded as excessive.

I have the deepest sympathy with the anæsthetist in this case, of whose identity I am ignorant. "There, but for the grace of God, go I." But I should like to obtain the opinions of my colleagues on the following four principles:

(1) New anæsthetic drugs must be assessed in comparison with ether.
(2) Final assessment cannot be made until many hundreds of thousands of administrations have been recorded. During this period of trial such drugs should be regarded as experimental.
(3) Such experimental drugs should not be given to bad risk cases.
(4) The dosage of such experimental drugs should be carefully regulated according to the published recommendations of senior anæsthetists.

It is only with the object of establishing these principles that, with humility and hesitation, I have sought the hospitality of your columns at such length.

London, W.1. R. BLAIR GOULD.

SIGMOIDOSCOPY IN AMŒBIC DYSENTERY

SIR,—I should like to add a postscript to my article of Oct. 13, 1945 (p. 460). Two points call for revision in the light of subsequent experience.

The first of these concerns technique. I have since found that the most satisfactory method of producing a "clean" lower bowel, whether for the diagnostic purpose of a sigmoidoscopy or for the therapeutic purpose of a retention enema, is by the simple administration of a weak bicarbonate enema, after which a period of 4–6 hours must be allowed to elapse. At the end of this period, regardless of the taking of meals meanwhile, the lower eight inches of bowel are almost invariably clean and "dry," in the sense that all traces of enema fluid have been evacuated or absorbed. An important point, and one often overlooked, is that the evacuant enema must be of just that volume which will produce an effective call to stool: this will be one pint in some, considerably more or less in others. There are still undesirable methods in use involving the exhibition of castor oil, &c., and I have known retention enemata given within a few minutes of the evacuant enema, thereby reducing the strength of the medicament used to quite ineffectual proportions. Such errors in technique not only defeat their object but often involve a sore trial for the long-suffering patient.

Secondly, a point in diagnosis. Recently I have seen a number of cases in which the ulcers are minute: with the ordinary magnifying lens they catch the eye merely as tiny points of extreme congestion. They are scattered in small groups, and frequently only one such group can be found. With a special magnifying attachment, first shown me by Lieut.-Colonel A. M. Khan, R.A.M.C., it is possible to detect the actual tissue loss.

Keighley, Yorks. C. F. J. CROPPER.

NON-SPECIFIC EPIDIDYMITIS

SIR,—Dr. Whitwell's letter of Sept. 7, recalling Slesinger's suggestion that non-specific epididymitis may be due to stress reflux of normal urine, prompts me to describe an experiment carried out at my suggestion by Dr. G. L. Timms, pathologist to Kenya Government Medical Service.

A rabbit was anæsthetised and 5 c.cm. of urine withdrawn by vesical puncture. Of this, a part was cultured and proved sterile. Of the remainder, 0·5 c.cm. was injected into the previously exposed vas deferens on one side. As this was done the epididymis could be felt to inflate with urine. The animal remained clinically normal after this operation; after 10 days the testis and epididymis on both sides were removed and sectioned. They were all normal.

As Handley says (*Lancet*, 1940, i, 779), the reflux theory does not seem very feasible; and this experiment appears to show that normal urine is not an irritant in the epididymis, at least in the rabbit.

London, W.1. F. RAY BETTLEY.

TUBERCULOUS GLANDS AND CALCIFEROL

SIR,—With reference to the treatment of tuberculous glands with high dosage of calciferol (July 20, p. 88), there seems to be some evidence that such treatment, while helpful when sinus formation is present, has a clinically adverse effect on glands which have not broken down. In the absence of more detailed investigation this is little more than an impression, but it would be in keeping with the observation that in the early stages of treatment of lupus vulgaris with calciferol there is not infrequently a local exacerbation of the disease. It would also be in keeping with similar observations on the influence of tuberculin in tuberculous lesions and of arsenic in untreated syphilis. Until further evidence is forthcoming it would appear advisable to use the calciferol treatment with caution when lung tuberculosis is present, since such a reaction in the lung might have disastrous sequels.

London, W.1. H. J. WALLACE.

NEW WORDS ABOUT OLD AGE

SIR,—In your issue of August 10 (p. 211) Dr. Howell discusses "the nomenclature of old age." It would be a benefit to medicine if you would help to get the "new words" fixed in correct form before it is too late.

From *pais* (stem *paid-*) a child, we have "pædiatrics," and from *geron* (stem *geront-*), an old person, we should have "gerontiatrics," *not* "geriatrics." There is no word *geria* in Greek, though there is *eugeria*, meaning a good old age. Gerontiatrics therefore is the word for the medical care of the aged and eugeria is its goal.

Orpington, Kent. H. ST. H. VERTUE.

TECHNIQUE OF PREFRONTAL LEUCOTOMY

SIR,—In order to avoid incision of the grey matter, I *suggest that* prefrontal leucotomy might be performed through an approach from the midline underneath the angular gyrus by an incision of the corpus callosum in the direction of its fibres. No doubt a special knife would have to be designed and a new technique devised for the new approach.

Taunton. T. F. G. MAYER.

*** We are informed that section from this angle would carry an appreciable risk of damage to the optic nerves.—ED. L.

THE Medical Research Council have received from Sir Leonard Rogers, F.R.S., a further addition to the endowment for research in tropical medicine with which he entrusted them in 1920. The capital value of this fund is now about £15,000, and the income is applicable to special purposes within the general field of tropical medical research.

PERNICIOUS ANÆMIA AND CARCINOMA OF THE ŒSOPHAGUS

SIR,—Nineteen years after the death sentence in pernicious anæmia (P.A.) was commuted to "liver for life" it is now becoming generally recognised that the patient with P.A. is more liable to gastric carcinoma than is his healthy neighbour.[1] The best examples of this concurrence seen here in the past few years were (1) a man with P.A. diagnosed by blood-count, barium meal, test-meal, &c., in July, 1938, who died, aged 37, in September, 1943, three months after laparotomy had revealed inoperable gastric carcinoma; and (2) a woman, first admitted to hospital with P.A. in October, 1933, who died in September, 1942, at the age of 39, after a short history of gastric upset; her neoplasm was proved by necropsy and histology. These two patients were considerably younger than in most of the recorded cases.

I have not been able to find any record of œsophageal cancer in a patient with P.A., and the following presumptive case is reported in the hope that others may look out for such cases.

A man, aged 49, was first sent to this department on March 31, 1938, by Dr. H. T. Cank, of Leyland, for a blood-count. He had had pneumonia in 1932 and 1933, and several attacks of "influenza" since, the last being a few weeks ago and attended by pain suggesting pleurisy. He had long been easily tired, had lost weight, and had recently noted soreness of the tip of his tongue.

His brother was known to the department as a case of P.A., having attended regularly since August 1, 1935, when he was 32 years old. Otherwise the family history was clear of anæmia and cancer.

Apart from clinical anæmia, physical examination was *negative. Blood-count showed red cells 2,500,000 per c.mm.*, Hb 70% (Haldane), C.I. 1·4; white cells 7200 per c.mm. (differential count normal). The mean red-cell diameter was 8·2 μ (halometer).

After treatment with 'Campolon' the blood became normal by April 27, 1938. On a dose of 2 c.cm. every three or four weeks, blood-counts were normal in March and July, 1939. Patient was seen once in 1940, thrice in 1941, and the figures were normal in four counts in 1942 and three counts in 1943, when 'Anahæmin' was being given. A test-meal in November, 1941, showed a histamine-fast achlorhydria. In January, 1943, patient was in hospital for four weeks with a left lobar pneumonia. He left hospital 17 lb. heavier than on admission.

On Jan. 5, 1944, he was readmitted, complaining that for three months he had been regurgitating food about an hour after eating, and that for six weeks he had felt food stick at about the level of the mid-length of the sternum. Despite a good appetite he had lost much weight, and he had sternal pain radiating to the right axilla.

He was wasted, and the right pupil was larger than the left. Blood-count was normal. Radiography of barium swallow showed œsophageal obstruction at the level of the lower edge of the aortic arch (Dr. T. Harrison). Hoarseness had now developed. A Witzel's gastrostomy was done on Jan. 26, but patient died on Feb. 2. Permission for necropsy was refused.

I wish to thank Dr. A. W. Baker and Dr. F. B. Smith for permission to record this case.

R. T. COOKE.

Department of Pathology, Royal Infirmary, Preston.

PSYCHOANALYSIS IN THE NATIONAL HEALTH SERVICE

SIR,—Clause 1 (1) of the National Health Service Bill states: "It shall be the duty of the Minister . . . to promote . . . a comprehensive health service designed to secure improvement in the physical and mental health of the people . . . and the prevention, diagnosis, and treatment of illness . . ." Nevertheless, psychotherapeutic, and especially psychoanalytic, treatment cannot be generally provided since psychiatrists trained in psychotherapeutic methods are only available in numbers sufficient to cope with a minute proportion of the total need. The number of patients being treated by psychoanalysis is indeed small compared to the need, but the number is not insignificant. Psychoanalysis is relatively new, it is time-consuming, and it is costly. Its use in treatment and in research cannot now be successfully controverted. The situation after the passage of the new Bill will be that a branch of the profession will be able to cope with the psychoanalytic treatment of a few hundred patients at one time, and the therapy is one which is known to exist to many. Any Minister of Health would be embarrassed at having to make regulations designating priorities for treatment, and if the selection is left to the individual practitioner there is sure to be heartburning in his medical colleagues who refer him patients. If psychoanalysis is not accepted as a treatment to be provided under the Bill there will be justified resentment among patients who are advised such treatment. If psychoanalysis is accepted in any degree the vast needs for training will become apparent.

At present the official body organises training in psychoanalysis and psychoanalytic treatment under the auspices of a clinic at small fees or free, and arranges publication and library facilities. The present endowment and fees are such that slow development is likely to continue to be possible without State aid. Under the new Bill eventual organisation as a part, for example, of the British Postgraduate Medical Federation, might become possible. Under clause 16 (1) the Minister is able to aid research, and perhaps eventually psychoanalytic research might obtain State subsidy. Nevertheless, it seems to be inevitable, though unfortunate, that psychoanalytic therapy, training, and research will for a time run an independent course.

London S.W.7. W. CLIFFORD M. SCOTT.

DEATH AFTER CURARE

SIR,—With reference to your annotation of Sept. 21, too much discredit is being thrown on a drug which was not entirely responsible for this fatality. With a woman aged 70 years, surely a dose of 'Pentothal' of the magnitude of 1 gramme was more than sufficient on its own for the performance of an appendicectomy lasting 43 minutes; yet to this a dose of 'Intocostrin' of 9 c.cm. (equivalent to 27 mg. of *d*-tubocurarine chloride) was added.

Since pentothal and curare are synergic in action, it seems strange that with these large doses no reference was made to the necessity for controlled or assisted respiration during the operation; reliance seems to have been placed more on 'Coramine' and 'Veritol' than artificial ventilation of the lungs with oxygen when cyanosis was first noted. Surely the cause of death was prolonged hypoxia, with toxæmia as a secondary cause.

May I add a rider that in all cases of gross respiratory depression an unobstructed airway must be ensured and controlled respiration performed before resort is made to respiratory stimulants.

E. ASQUITH.

London, S.W.1.

SIR,—Your report on this case raises many issues of great importance. At a time when anæsthetists are attempting to establish curare as a safe and useful drug it is very tragic that such a case should occur. Yet many useful lessons may be learnt from it. Apart from your report the case is unknown to me, and I assume that the facts as reported are correct.

(1) The wisdom of using a new and experimental drug (I am aware some may question the epithet) on such a bad risk case appears to me doubtful in the extreme. It would be very useful if the opinions of my senior colleagues on this could be ventilated in your columns. I use the term "experimental" deliberately, for there is a drug still used by some of us, known as ether, which has been employed as an anæsthetic agent for 100 years on many millions of cases. Any new drug which has been in use for only a few years on a few thousand cases must, by comparison, be termed "experimental."

This appears to me to be an important principle to establish. In an evening paper recently an anæsthetist is reported to have stated that in a certain fatal case curare was used as being the safest possible drug in the circumstances. Compared with ether, it is very doubtful if curare could at present be correctly described as the safest possible drug in any circumstances. Before the value of any anæsthetic drug can be assessed it must be used in hundreds of thousands of cases over a long period. Some drugs have such obvious limitations that their value, or lack of it, is soon discovered. Others, of greater promise, require a longer trial. For example, lopropane, which appeared at the outset to have such at promise, required five years of trial before it could said to have passed the experimental stage. Curare, ich appears to be of even greater value than cyclo- opane, will probably require an even longer trial. I pe that, unlike 'Pentothal,' it will not prove to be drug "fatally easy" to administer.

---

[1] Leading article, *Lancet*, 1945, ii, 406.

(2) When we examine the dosage of drugs used in is case, it would appear that the coroner's verdict was aritable. An old lady of 70, *suffering for two days* om an acute abdominal infection, and with early eritonitis, was given morphine gr. $^1/_4$ and atropine . $^1/_{100}$. I would presume to say that the former drug as superfluous. This was followed by 1 g. of pentothal. n my opinion this was an excessive dose, even had itrous oxide been the only additional anæsthetic to be iven. With curare in a fit subject in first-class condition personally hesitate to give more than half this dosage. Prescott, Organe, and Rowbotham (*Lancet*, July 20, . 80) have pointed out the danger of giving two such espiratory depressants together in full dosage. The present case illustrates this danger. I am not surprised hat the patient required continuous oxygen.

This was followed by 'Intocostrin' 9 c.cm.—180 units. Presumably this was given intravenously in a single dose. So far as I am aware, 100 units of this drug is regarded by authorities as a maximum single dose even in fit subjects. In *any* case, we are warned that in the very young, or the very old, or in bad risk cases, this dose must be considerably reduced. I hope that those who are more competent than myself to express an opinion will let us know in your columns whether this dosage should be regarded as excessive.

I have the deepest sympathy with the anæsthetist in this case, of whose identity I am ignorant. "There, but for the grace of God, go I." But I should like to obtain the opinions of my colleagues on the following four principles:

(1) New anæsthetic drugs must be assessed in comparison with ether.

(2) *Final assessment cannot be made until many hundreds* of thousands of administrations have been recorded. During this period of trial such drugs should be regarded as experimental.

(3) *Such experimental drugs should not be given to bad risk cases.*

(4) The dosage of such experimental drugs should be carefully regulated according to the published recommendations of senior anæsthetists.

It is only with the object of establishing these principles that, with humility and hesitation, I have sought the hospitality of your columns at such length.

London, W.1. R. BLAIR GOULD.

SIGMOIDOSCOPY IN AMŒBIC DYSENTERY

SIR,—I should like to add a postscript to my article of Oct. 13, 1945 (p. 460). Two points call for revision in the light of subsequent experience.

The first of these concerns technique. I have since found that the most satisfactory method of producing a "clean" lower bowel, whether for the diagnostic purpose of a sigmoidoscopy or for the therapeutic purpose of a retention enema, is by the simple administration of a weak bicarbonate enema, after which a period of *4–6 hours* must be allowed to elapse. At the end of this period, regardless of the taking of meals meanwhile, the lower eight inches of bowel are almost invariably clean and "dry," in the sense that all traces of enema fluid have been evacuated or absorbed. An important point, and one often overlooked, is that the evacuant enema must be of just that volume which will produce an effective call to stool: this will be one pint in some, considerably more or less in others. There are still undesirable methods in use involving the exhibition of castor oil, &c., and I have known retention enemata given within a few minutes of the evacuant enema, thereby reducing the strength of the medicament used to quite ineffectual proportions. Such errors in technique not only defeat their object but often involve a sore trial for the long-suffering patient.

Secondly, a point in diagnosis. Recently I have seen a number of cases in which the ulcers are minute: with the ordinary magnifying lens they catch the eye merely as tiny points of extreme congestion. They are scattered in small groups, and frequently only one such group can be found. With a special magnifying attachment, first shown me by Lieut.-Colonel A. M. Khan, R.A.M.C., it is possible to detect the actual tissue loss.

Keighley, Yorks. C. F. J. CROPPER.

NON-SPECIFIC EPIDIDYMITIS

SIR,—Dr. Whitwell's letter of Sept. 7, recalling Slesinger's suggestion that non-specific epididymitis may be due to stress reflux of normal urine, prompts me to describe an experiment carried out at my suggestion by Dr. G. L. Timms, pathologist to Kenya Government Medical Service.

A rabbit was anæsthetised and 5 c.cm. of urine withdrawn by vesical puncture. Of this, a part was cultured and proved sterile. Of the remainder, 0·5 c.cm. was injected into the previously exposed vas deferens on one side. As this was done the epididymis could be felt to inflate with urine. The animal remained clinically normal after this operation; after 10 days the testis and epididymis on both sides were removed and sectioned. They were all normal.

As Handley says (*Lancet*, 1946, i, 770), the reflux theory does not seem very feasible; *and this experiment* appears to show that normal urine is not an irritant in the epididymis, at least in the rabbit.

London, W.1. F. RAY BETTLEY.

TUBERCULOUS GLANDS AND CALCIFEROL

SIR,—With reference to the treatment of tuberculous glands with high dosage of calciferol (July 20, p. 88), there seems to be some evidence that such treatment, while helpful when sinus formation is present, has a clinically adverse effect on glands which have not broken down. In the absence of more detailed investigation this is little more than an impression, but it would be in keeping with the observation that in the early stages of treatment of lupus vulgaris with calciferol there is not infrequently a local exacerbation of the disease. It would also be in keeping with similar observations on the influence of tuberculin in tuberculous lesions and of arsenic in untreated syphilis. Until further evidence *is forthcoming it would appear advisable to use the* calciferol treatment with caution when lung tuberculosis is present, since such a reaction in the lung might have disastrous sequels.

London, W.1. H. J. WALLACE.

NEW WORDS ABOUT OLD AGE

SIR,—In your issue of August 10 (p. 214) Dr. Howell discusses "*the nomenclature of old age.*" It would be a benefit to medicine if you would help to get the "new words" fixed in correct form before it is too late.

From *pais* (stem *paid-*) a child, we have "pædiatrics," and from *geron* (stem *geront-*), an old person, we should have "*gerontiatrics,*" *not* "*geriatrics.*" There is no word *geria* in Greek, though there is *eugeria*, meaning a good old age. Gerontiatrics therefore is the word for the medical care of the aged and eugeria is its goal.

Orpington, Kent. H. ST. H. VERTUE.

TECHNIQUE OF PREFRONTAL LEUCOTOMY

SIR,—In order to avoid incision of the grey matter, I suggest that prefrontal leucotomy might be performed through an approach from the midline underneath the angular gyrus by an incision of the corpus callosum in the direction of its fibres. No doubt a special knife would have to be designed and a new technique devised for the new approach.

Taunton. T. F. G. MAYER.

*** We are informed that section from this angle would carry an appreciable risk of damage to the optic nerves.—ED. L.

THE Medical Research Council have received from Sir Leonard Rogers, F.R.S., a further addition to the endowment for research in tropical medicine with which he entrusted them in 1926. The capital value of this fund is now about £15,000, and the income is applicable to special purposes within the general field of tropical medical research.

Obituary

CHARLES FERRIER BEEVOR

M.A., B.M. OXFD

Mr. C. F. Beevor, surgeon to the ear and throat department of the Royal Waterloo and Evelina Hospitals, died on Sept. 15 at the age of 62. A son of Dr. C. E. Beevor, the well-known neurologist, he was educated at Charterhouse, and Magdalen College, Oxford, where he graduated in 1906, taking honours in chemistry in the final school of natural science. Continuing his medical training at University College Hospital, he took his B.M. in 1912, soon afterwards becoming house-physician to Sir John Rose Bradford, and later a house-surgeon at Charing Cross Hospital.

Early in his career he became interested in otolaryngology, and worked in the special department at U.C.H. until 1915, when he went to Egypt with a commission in the R.A.M.C. as an otological specialist at one of the clearing stations, where he remained until he was invalided home in 1918. Not long after this he took up his work again as a specialist and was appointed to the staffs of the Royal Waterloo Hospital and the Evelina Hospital. His successful practice included many friends and colleagues.

"Essentially an individualist," writes M. D., "Charles Beevor hated regimentation and resented interference by red tape with his own individual methods of work. It was, perhaps, largely this peculiarity which militated against his chances of promotion in the academic world of medicine, but his comparative freedom from such commitments gave him more scope to develop his gifts in his own way. His individualism inevitably resulted in faults which sometimes showed themselves to his disadvantage: but in his professional practice it expressed itself as a great kindliness and in a disposition to spare no trouble where his patient's comfort was concerned, and his friends loved him for his loyalty no less than for his good fellowship."

Mr. Beevor leaves a widow and two daughters.

HAROLD FRANCIS LEWIS HUGO

M.C., M.B. LOND.

Dr. H. F. L. Hugo, who died at Crediton on Sept. 14 at the age of 60, had an unusually promising career as a student which suggested that he might have made a considerable reputation had he wished to do so. He elected, however, to become a general practitioner, and for more than thirty years practised at Crediton, to its great comfort and benefit. His work was interrupted by the first world war, when he served with distinction as medical officer to the Devon Yeomanry, by whom he was greatly and rightly beloved. His kindness, firmness, and courage did much to sustain the unit through bad times in Gallipoli and elsewhere.

Like so many good men he was profoundly dissatisfied with himself though infinitely forgiving to others. His patience was inexhaustible, his humour abundant, sometimes betraying his lively Gallic ancestry. As a young man he was a "class" soccer player, and he remained a useful fastish bowler till well on in the thirties. He was, moreover, a good bridge player, though perhaps he got—and gave—as much fun out of golf, which he was wise enough not to take seriously, and billiards or snooker, in which he fluked outrageously. His keen interest in natural history developed with the years. The loss of both his sons in the recent war was a blow from which he never recovered though he did not murmur and continued to work as long as he could.

Many will mourn the passing of a handsome, blue-eyed, shy but friendly, and extremely competent doctor who always refused to make speeches but whose wise guidance was invaluable to the many committees to which he was almost automatically elected. L. N. J.

THE death is announced of Sir JOHN HARRIS, M.D., member of the Legislative Council of Victoria since 1920 and minister of public instruction and public health for the State from 1935 to 1941. He graduated M.B. at the University of Melbourne in 1890 and practised in his native town of Rutherglen, in Victoria, till 1917, when he served as medical officer to no. 1 Squadron, Australian Flying Corps, in Palestine. He was appointed K.B.E. in 1937.

Appointments

CHALMERS, J. A., M.D. Edin., F.R.C.S.E., M.R.C.O.G.: gynæcologist and obstetrician in the North of Scotland and hon. charge gynæcologist, Royal Northern Infirmary, Inverness.

CLEGG, J. W., M.R.C.S., D.C.P.: pathologist, Hospital for Consumption and Diseases of the Chest, Brompton.

DAY, F. M., M.R.C.S., D.P.H., D.T.M.: M.O.H., Hammersmith.

DORE, J. C., M.B.N.U.I., D.M.R.: junior asst. radiologist (diagnostic), Middlesex Hospital, London.

FOWLER, ERIC, B.M. Oxfd: examining factory surgeon, Crowborough, Sussex.

FOX, P. P., M.B. Lpool, D.P.H.: M.O.H. for Chard, Crewkerne, and Langport and asst. county M.O., Somerset.

GRIERSON, A. M. M., M.D. Edin.: deputy M.O.H., Manchester.

HAY, A. B., M.B. Aberd., M.R.C.O.G.: gynæcologist and obstetrician in the North of Scotland and hon. charge gynæcologist, Royal Northern Infirmary, Inverness.

MITCHISON, D. A., M.B. Camb.: asst. to the pathologist, Hospital for Consumption and Diseases of the Chest, Brompton.

MOREL, M. P., M.A. Camb., F.R.C.S.: surgeon, North Devon Infirmary, Barnstaple.

St. Bartholomew's Hospital, E.C.1:

HARPER, R. A. K., M.B. Edin., D.R.: director of X-ray diagnostic dept. (whole-time).

LOUGHBOROUGH, G. T., M.R.C.S., D.M.R.E.: M.O., X-ray diagnostic dept. (part-time).

SIMON, GEORGE, M.D. Camb., D.M.R.E.: M.O., X-ray diagnostic dept. (part-time).

London Chest Hospital, E.2:

BARLOW, DONALD, M.S. Lond., F.R.C.S.: asst. surgeon.

BROWN, A. I. P., M.B. Lond., D.A.: anæsthetist.

LINDAHL, J. W. S., M.CHIR. Camb., F.R.C.S.: asst. laryngologist.

MOUNTFORD, L. O., M.B. Camb., D.A.: anæsthetist.

ROSE, ALICE C., M.B. N.Z., M.R.C.P., D.A.: anæsthetist.

Addenbrooke's Hospital, Cambridge:

BERRIDGE, F. R., M.B. Camb., D.M.R.: radiologist.

LLOYD, OSWALD, M.D. Lond., F.R.C.S., M.R.C.O.G.: surgeon to gynæcological and obstetrical depts.

MARTIN, LAURENCE, M.D. Camb., M.R.C.P.: physician.

TRUSCOTT, B. M., M.B.E., M.B. Lond., F.R.C.S.: surgeon.

WRIGHT, G. F., M.B. Camb., D.O.M.S.: ophthalmic surgeon.

Royal Liverpool United Hospital (Liverpool Royal Infirmary):

BAMBER, G. W., M.D. Camb., F.R.C.P.: dermatologist.

MACPHEE, G. G., M.D. Glasg., L.D.S.: dental surgeon.

SEATON, D. R., M.B. Camb., M.R.C.P., D.T.M. & H.: asst. physician for tropical diseases.

WHITAKER, P. H., M.D. Lpool, D.M.R.E.: radiologist.

Colonial Medical Service:

ANTONIO, R. F., M.B. Edin.: M.O., Gold Coast.

ASHE, GEOFFREY, M.B. Manc.: M.O., British Somaliland.

BALEAN, G. T., M.R.C.S.: M.O., Zanzibar.

BEST, A. M., M.R.C.S.: M.O., Uganda.

COOPER, P. R., B.M. Oxfd, D.T.M.: M.O., Nigeria.

EDINGTON, Major G. M., M.B. Glasg.: M.O., Gold Coast.

HANDFORTH, J. R., M.B. Camb.: M.O., Hong-Kong.

MACDONALD, Captain W. H., M.B. Lond.: M.O. (grade II), Western Pacific.

PABLOT, P. J., M.B. Lond., D.T.M. & H.: M.O. (grade I), Mauritius.

SMITH, Lieut.-Colonel G. G., M.R.C.S.: M.O., British Honduras.

STONES, P. B., M.B. Lond.: M.O., Nigeria.

WATERSTON, WILLIAM, L.R.C.P., L.D.S.: M.O., Kenya.

WEST, J. H., M.R.C.S.: anæsthetist, Uganda.

The appointments to the Bradford Royal Infirmary announced in our issue of Sept. 14 were made under the auspices of the Bradford Joint Hospitals Council and are not to the infirmary alone but to all the hospitals in the city.

Births, Marriages, and Deaths

BIRTHS

ASHFORD-BROWN.—On Sept. 14, in London, the wife of Dr. W. H. Ashford-Brown—a son.

HEANLEY.—On Sept. 18, in London, the wife of Mr. Charles Heanley, F.R.C.S.—a son.

MILLS.—On Sept. 17, in Birmingham, Dr. Margaret Mills, D.A., wife of Mr. W. G. Mills, F.R.C.S.—a daughter.

OLIVER.—On August 29, at Sheffield, the wife of Dr. G. B. Oliver—a son.

RUDLAND.—On Sept. 20, at Coventry, the wife of Surgeon Commander R. S. Rudland, R.N.V.R.—a daughter.

MARRIAGES

LIGHT—BELL.—On Sept. 14, in London, Lovell Hillier Ben[illegible] Light, M.R.C.S., to Colyeen Audrey Bell.

LONGLEY—DRURY.—On August 22, at Felpham, John Douglas Brougham Longley, M.R.C.S., to Elizabeth Clara Dru Drury.

DEATHS

BOYCOTT.—On Sept. 17, at St. Albans, Arthur Norman Boycott, M.D. Lond., aged 80.

COOK.—On Sept. 19, John Howard Cook, M.S. Lond., F.R.C.S., formerly of C.M.S. medical department, aged 75.

COOPER.—On Sept. 13, in Maine, U.S.A., Harold Merriman Cooper, O.B.E., M.B. Lond., formerly of Hampton-on-Thames, Middlesex, aged 74.

GILBERT.—On Sept. 12, at Naini Tal, India, Leonard Erskine Gilbert, C.I.E., M.D. Lond., lieut.-colonel I.M.S., retd., aged 7[illegible].

HOLMES.—On Sept. 15, at Godalming, Richard Annesley Holmes, M.R.C.S., aged 61.

HUGO.—On Sept. 14, at Crediton, Devon, Harold Francis Lewis Hugo, M.C., M.B. Lond., aged 60.

WATTS EDEN.—On Sept. 22, Thomas Watts Eden, M.D. Edin., F.R.C.P., F.R.C.O.G., aged 83.

Notes and News

WESTMINSTER HOSPITAL AND THE INFANTS HOSPITAL

THE governing bodies of Westminster Hospital and the Infants Hospital, Vincent Square, have agreed to the merging of their two institutions. The Infants Hospital, which has been used during the war as a hospital for officers of the United States Forces, will be reopened as soon as possible ; the "Westminster Children's Hospital." A good deal of r-raid damage will have to be repaired before its services n be fully developed, but the bed accommodation will entually be increased to 140.

The fusion of the two hospitals will make it possible to ncentrate all pædiatric services and research at Vincent quare, where Westminster Hospital students will have xceptional opportunities for the study of children's ailments.

This is one of several affiliations being negotiated by estminster Hospital following the recommendation made the report of the Ministry of Health survey. The hospital as also recently taken over two convalescent homes with 60 beds situated in the country a short distance from London r the reception of patients in an early state of convalescence here after-treatment and industrial rehabilitation can be onducted.

JOURNALS AND BOOKS WANTED ABROAD

Dr. A. Tudor Hart tells us that the International Brigade ssociation has had urgent requests from former medical officers f the I.B. Medical Service in the Spanish War, now working nce more in their own countries, for current issues of medical ournals. "Would some of your subscribers," he asks, "be villing to forward their *Lancet* regularly for a year? If so, vill they please write to the secretary, International Brigade Association, 14, Red Lion Square, London, W.C.1, who will let them have a name and address. We have other former olleagues still working in China to whom we should especially like to forward recent and expensive surgical textbooks. May we also appeal for some donations for this object? They should be sent to the same address marked 'Medical Textbook Fund.'"

DENTISTS' FEES UNDER N.H.I.

THE British Dental Association has approved the decision of the General Advisory Dental Council to advise dentists to refuse all dental benefit letters but to treat patients privately at the scale of fees rejected by the Ministry of National Insurance. The representatives of the association will not take part in the work of the Dental Benefit Council until the dispute is settled.

HOSPITALS AND HEALTH CENTRES IN U.S.A.

THE President of the United States has signed the Hospital Survey and Construction Act, authorising Federal expenditure of 375 million dollars during the next five years for the construction of hospitals and health centres, and 3 million dollars for the surveys which must precede such construction. Each State is to develop its own programme for hospitals and health centres, to be administered by State authorities under standards specified by the U.S. Public Health Service. Any State may initiate action by submitting a request to the surgeon-general of this service for funds to carry out an inventory of existing hospitals, and to prepare a plan for the construction necessary to provide adequate care for all the people. In defraying the survey expenses Federal funds must be matched by two to one. Allotments for actual construction will not be made until the State plan based on the survey findings has been approved. Construction allotments to individual States will vary in amount: States with a lower per-capita income, where there is relatively greater need for medical facilities, will receive larger allotments per head. Before any individual project is approved by the surgeon-general, it must be shown that two-thirds of the total cost of construction is available from other-than-Federal sources, and that money can be found to maintain and operate the institution after completion.

In the view of Dr. Thomas Parran, the surgeon-general, "this Act sets for the first time a national policy which makes it clear that hospitals in the future must be planned, located, and operated in relation to the overall health needs of the people. . . . Adequate hospitals, health centres, and related physical facilities are the essential workshops, without which it is not possible to provide even a minimum of modern health and medical services."

R.N. SICK BERTH STAFF

SINCE 1933 the Central Council of the Royal Naval Sick Berth Staff Associations have been helping the men of the Royal Naval Sick Berth Staff to find posts as male nurses on their return to civil life, and through their efforts attendants with suitable qualifications are now registered as Service-trained male nurses.

There are now vacancies on the council, and R.N. or R.N.V.R. medical officers, active or retired, who would be willing to help in this work are asked to write to Surgeon-Captain M. H. Knapp, c/o Medical Department, Admiralty, 64, St. James's Street, London, S.W.1.

SCABIES FILM REVISED

THE M.O.I. film *Scabies* has been revised and is to be reissued early in November by the Central Office of Information under the title *Scabies 1946*. The latter half dealing with treatment has been largely retaken, new shots being inserted, and the commentary has been entirely rewritten.

Starting as before with good close-ups of the habits and development of the mite, the film shows next the characteristic sites of infestation; after this is inserted new material showing the range of drugs available for treatment and their relative efficiency, and then the film goes on as before to show the method of applying benzyl benzoate emulsion. The sequence on the relative merits of treating secondary infection or the infestation first has again been glossed over, but more emphasis is now laid on the importance of treating the whole family rather than the individual.

This new version, which has been shortened to run for 24 min., is an improvement on the old even though some avoidable errors have been retained—for instance, the misleading term "microphotography" where "photomicrography" is intended. It will be screened again with benefit even to those who saw the original version.

FOOD RATIONS FOR THE GERMANS

IT was announced in Berlin last Monday that the basic food ration in the British and American zones of Germany will be raised again to 1550 calories daily for the normal consumer from Oct. 14. The decision to increase the ration at once, although there is no certainty of maintaining supplies till next harvest, has been taken because of the urgency of the situation as depicted in the June report of the tripartite committee of investigation (*Lancet*, 1946, i, 896: July 6, p. 22). This report said that for ordinary consumers the ration of 1550 calories achieved last winter, when supplemented with unrationed foods, barely sufficed to maintain health.

BLOOD-TRANSFUSIONS IN SCOTLAND

IN the quarter ended June 30, 1946, hospitals in Scotland used 4136 pints of whole blood for transfusion, compared with 4094 pints in the previous quarter, and their demands for liquid plasma rose from 830 to 1448 pints. The Scottish National Blood Transfusion Association was able to meet the increased need, 7888 pints of blood being obtained from donors in the June quarter, a rise of 657 pints over the March total.

HOME PRODUCTION OF STREPTOMYCIN

FOUR British firms are to coöperate with the Ministry of Supply, the Ministry of Health, and the Medical Research Council in the pilot-scale production of streptomycin, and it is hoped that preliminary clinical trials will begin before the end of 1946. The firms concerned are Messrs. Boots, Glaxo Laboratories, and the Distillers Company, who are all established penicillin manufacturers, and the Heyden Chemical Company, who are to instal a factory to make penicillin and streptomycin at Ardrossan, Scotland.

Streptomycin will not be released for general medical use until the conditions which respond to it have been clearly established, and the clinical trials will take a considerable time. Meanwhile plans will proceed for large-scale production to meet the demands of the medical profession as a whole. The drug is already undergoing clinical trials in the United States in all types of tuberculosis, dysentery, typhoid, and paratyphoid fever, and certain infections of the urinary tract, particularly those which do not respond to penicillin or sulphonamides. Supplies in America are at present too small for any substantial quantity to be made available for this country.

It seems likely that streptomycin will be more expensive than penicillin on a per-case basis.

Major T. M. PEMBERTON, F.R.C.S., R.A.M.C., has been appointed M.B.E. in recognition of gallant and distinguished service while a prisoner-of-war.

University of Leeds

The inaugural lecture of the faculty of medicine will be given at 3.30 P.M. on Monday, Oct. 14, when Lieut.-General Sir William MacArthur, F.R.C.P., will speak on Insect-borne Disease and English History.

Society of Apothecaries of London

Diplomas in industrial health have been granted to the following: A. Anderson, K. Biden-Steele, M. P. Fitzsimons, G. B. Oliver, G. F. Keatinge. This list replaces that published on Sept. 7 (p. 368).

Welsh National School of Medicine

The opening address for the new session of this school is to be given by Sir Wilson Jameson, chief medical officer of the Ministry of Health, in the Institute of Physiology, Newport Road, Cardiff, on Friday, Oct. 4.

Faculty of Homœopathy

Dr. C. E. Wheeler will deliver his presidential address to the faculty at the London Homœopathic Hospital, Great Ormond Street, London, W.C.1, on Thursday, Oct. 3, at 5 P.M. His subject is to be Looking Before and After.

Royal Medical Society

On Friday, Oct. 11, at 8 P.M., at 7, Melbourne Place, Edinburgh, Sir Henry Wade will give the inaugural address of the 210th session of this society. He is to speak on the Life of an Edinburgh Medical Student 300 Years Ago.

Irish Tuberculosis Society

At a meeting of the society to be held at Newcastle Sanatorium, co. Wicklow, on Saturday, Oct. 19, at 2 P.M., Dr. F. R. G. Heaf will read a paper on Recent Trends in Tuberculosis, Dr. Dorothy Price will discuss whether B.C.G. vaccination is a practical proposition in Ireland, and Prof. F. J. Henry will speak on Surgery in the Treatment of Tuberculosis.

St. Thomas's Hospital

The old students' dinner will take place at Claridge's Hotel, Brook Street, London, W.1, on Nov. 1, at 7.30 P.M. Sir Maurice Cassidy is to take the chair. The number of places is limited to 250, and applications should be sent to the secretaries of the dinner committee, St. Thomas's Hospital, S.E.1.

Royal Sanitary Institute

On Wednesday, Oct. 9, at 2.30 P.M., at 90, Buckingham Palace Road, London, S.W.1, Dr. W. R. Martine, senior assistant M.O.H. for Birmingham, and Mr. R. S. Cross, chief sanitary inspector for Brighton, will open a discussion on the Public Health Aspects of the Manufacture of Ice-cream.

"Anæsthesia"

The first number of this quarterly journal, which Dr. C. Langton Hewer is editing on behalf of the Association of Anæsthetists of Great Britain and Ireland, will appear on Oct. 1. The publishers are George Pulman & Sons, Ltd., Thayer Street, London, W.1.

An Italian Medical Students' Association

An Associazione Studentesca Internazionale has been founded in the University of Padua and has taken the name of the Digamma-Pi Association from Sinclair Lewis's *Doctor Arrowsmith*. It seeks to promote friendship and exchange of information and opinions between medical students all over the world, and would welcome inquiries addressed to it (in any European language or Esperanto) at the Liviano Palace, University of Padua, Italy.

Middlesex Hospital and the New Service

Mr. T. Money-Coutts, treasurer of the Middlesex Hospital, speaking at a meeting of the court of governors reported in the *Times* of Sept. 19, said he looked forward to the future of the hospital under the new National Health Service with confidence and enthusiasm. It had been said that the new Act would change the character of the voluntary hospitals, but he believed that 200-year-old traditions such as theirs had the strength not only to survive but to thrive on changes inherent in the development of our social system. The character of an institution depended not on Acts of Parliament but on the personality and ideals of those who worked for it. For those who had helped the voluntary hospitals in the past the new Act was not a signal for abdication but a challenge, and the Middlesex would continue to depend on the interest of their friends to maintain and improve their standards for treating the sick.

He added that the medical school was flourishing, and that women students will be admitted for the first time in October.

National Hospital, Queen Square

On Monday, Sept. 30, at 4 P.M., Dr. Gordon Holmes, F.R.S., will give the inaugural address of the first post-war course of clinical neurology to be held at this hospital.

Return to Practice

The Central Medical War Committee announces that Dr. W. Lindesay Neustatter has resumed civilian practice at 128, Harley Street, W.1 (Welbeck 3686).

Divine Healing and General Medical Practice

Dr. H. E. Collier will give the first of three monthly lectures on this subject at Denison House, 296, Vauxhall Bridge Road, London, S.W.1, on Wednesday, Oct. 16, at 7 P.M. The lectures are being given under the auspices of the Churches Council of Healing founded by the late Archbishop Temple.

International Hæmatological Conference

The International Hematology and Rh Conference will be held in Dallas, Texas, on Nov. 15. The guest speakers will include: Dr. Philip Levine (Linden, New Jersey), Dr. R. R. Race (London), Dr. William Dameshek (Boston), Dr. Ernest Witebsky (Buffalo), Dr. I. Davidsohn (Chicago), Dr. Louis K. Diamond (Boston), Dr. Ludwig Hirszfeld (Wroclaw, Poland), Dr. Ignacio Gonzalez Guzman and Dr. E. Uribe Guerola (Mexico City), and Dr. J. M. Hill (Dallas). The secretary of the conference is Dr. Sol Haberman, Baylor University Hospital, Dallas, Texas.

Messrs. Ward, Blenkinsop & Co. have moved from Liverpool and their address is now 6, Henrietta Place, London, W.1 (Langham 3185).

A CORRESPONDENT points out that in our annotation of Sept. 7 (p. 352) on hybrid corn, the word *diœcious* was used when *monœcious* was intended.

PENICILLIN IN BILE.—In our annotation on penicillin and sulphathiazole in typhoid fever (Sept. 7, p. 353) the remark that penicillin is concentrated in the bile should read: "Penicillin is excreted in the bile in concentrations similar to, or even higher than, those attained in the blood" (see Rammelkamf, C. H., Helm, J. D. *Proc. Soc. exp. Biol., N.Y.* 1943, 54, 31).

Medical Diary

SEPT. 29 TO OCT. 5

Tuesday, 1st

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. H. A. Harris: Clinical Anatomy of the Lymphatic System.
5 P.M. Prof. Geoffrey Hadfield: The Reticuloses.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.30 P.M. *Orthopædics.* Mr. V. H. Ellis: Injuries of the Cervical Spine. (Presidential address.)
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. J. E. M. Wigley: Eczema.

Wednesday, 2nd

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: Growth of Bones.
5 P.M. Dr. Montague Maizels: Liver Efficiency Tests.
ROYAL SOCIETY OF MEDICINE
2.30 P.M. *History of Medicine.* Sir Arthur MacNalty: Evolution of English Preventive Medicine. (Presidential address.)
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Mr. John Foster: *An Ophthalmic Tour of Switzerland.*

Thursday, 3rd

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: Epiphysial Growth Cartila
5 P.M. Dr. Montague Maizels: Liver Efficiency Tests.
ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology.* Dr. Douglas McAlpine: Disseminated Sclerosis. (Presidential address.)
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. G. Bamber: Misuse of Antiseptics and other Medicaments in Dermatology.
EDINBURGH POSTGRADUATE LECTURE
4.30 P.M. (Royal Infirmary.) Mr. J. R. Cameron: Congenita Abnormalities of the Kidney.

Friday, 4th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Wood Jones, F.R.S.: Anatomy of the Skin.
5 P.M. Prof. J. Z. Young, F.R.S.: *Nerve Injury* and Nerv Regeneration.

Saturday, 5th

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY
9 A.M. (Buxton.) Dr. J. Van Breemen: Four Causal Factors o Rheumatic Disease.
5.30 P.M. Mr. R. Whittington: *Plasma Viscosity.*

CONDUCING TO THE CURE

SOCIAL PSYCHIATRY IN THE TREATMENT OF NEUROSYPHILIS BY INDUCED MALARIA

MAEVE WHELEN
M.D. Lond., D.P.M.
MEDICAL OFFICER I C MALARIA THERAPY CENTRE, HORTON EMERGENCY HOSPITAL

M. H. BREE
PSYCHIATRIC SOCIAL WORKER

> "Life is short and Art is long; the Crisis is fleeting: Experiment risky; Decision difficult. Not only must the physician be ready to do his duty, but the patient, the attendants and external circumstances must conduce to the cure."

THIS famous aphorism of Hippocrates expresses a profound truth. Medicine originated as a social art. Hospitals are the descendants of purely social agencies, the hospices of the early Christian era which gave shelter not only to the sick but to the poor, the aged, orphans, and travellers: later their functions were separated and the hospital caring only for the sick appeared. Sickness was regarded as a social phenomenon, as possession by the devil, as punishment for wrongdoing, and so on. This gradually gave way to the scientific approach to disease and the sick person became an interesting pathological specimen rather than an individual member of the community. We are now entering the era of the synthesis of these two outlooks on sickness, and it is more and more widely recognised that a patient is not only a carrier of a disease process but is also an individual, a person living in a community who reacts upon and is reacted upon by that community. Sir Arthur MacNalty (1943) expressed this well when he said that one of the first steps in public-health reform was the realisation that all forces—medical, environmental, social, and individual—must be used to maintain national health and combat disease.

The work of Canby Robinson at the Johns Hopkins Hospital (Robinson 1939) is further evidence of the need for the collaboration of medicine and social science. He studied some hundreds of patients from the emotional and social aspects and found that two-thirds of them had adverse social conditions relating to their illness, and in over half of these the adverse social conditions were giving rise to emotional disturbances. He concluded that the study of the patient as a whole and as a person was essential to good medical practice, and that a knowledge of a patient's difficulties would often throw light on problems in public health and preventive medicine.

This paper is based upon a personal experience of an attempt to link clinical medicine with practical social science. The range of our experience is necessarily limited by the nature of our work, but we feel there are sufficient aspects of it to show the value of this collaboration.

PRACTICAL APPLICATION

The starting-point of our work is the treatment of neurosyphilis by induced malaria. We do not intend to say anything about the strictly medical side of the treatment—this has been done often and well—but to confine ourselves to what might be called its social aspect.

Before going any further we must say a few words about the types of patients admitted for treatment. Since 1940 our range of patients has included a small proportion of certified general paralytics and taboparetics on leave of absence from their mental hospital for the purposes of treatment; a much larger proportion of relatively early cases who do not require certification to bring them under treatment; tabetics; cases of syphilitic optic atrophy with or without other clinical signs; asymptomatic cases without any clinical signs or symptoms but with cerebrospinal fluid (C.S.F.) positive on routine testing. Most of our patients have acquired syphilis, but some have congenital syphilis and vary from the gross mental defective to the asymptomatic case.

Illness, especially if it is prolonged and serious, always engenders a situation fraught with anxiety, which involves not only the sick person himself but also his family and sometimes his friends. This anxiety, although each case will have its specific factors, is based fundamentally on fear of the illness itself and what it may betoken—actual or potential economic stress and uncertainty about the future. Fear of the illness itself may be aggravated if there is a feeling that there is something mysterious about it and that it is not properly understood. A large proportion of our patients are admitted with $1^1/_2$–2 years' history of vague but progressive symptoms; in some cases there have been repeated visits to the doctor and various hospitals, only to be told there is nothing wrong or to be given a week or two's sick-leave as a placebo. Finally they become so ill that they have to be admitted to hospital, and a thorough investigation reveals the cause of all the trouble. Throughout this time there has been a gradually increasing anxiety, which is often very greatly eased as soon as a definite course of action is proposed.

Emotional reaction to the illness is absent in the grossly psychotic or demented, but it is worth while to remember that it may be present in a patient showing mental symptoms. One of the worst cases of this sort of anxiety we have seen was in a man with mild confusion and severely impaired memory who was aware of his disabilities and knew the nature of his illness. He was a most pathetic object, and, owing to his mental condition, very difficult to help.

Sickness invariably raises economic problems for the patient and his family, and unless these can be quickly and satisfactorily settled they may give rise to a great deal of unnecessary distress. This situation should be dealt with as expeditiously and sympathetically as possible by the medicosocial worker.

Lastly there is the question of the future. This involves not only the outcome of the actual illness but, in many cases, the patient's ultimate re-establishment in the community. It is often very difficult or impossible to give a definite answer. The best one can do is to give a simple and straightforward explanation, bearing in mind the differing degrees of intelligence and understanding of those concerned. This has the added advantage of enlisting their coöperation in the follow-up scheme. In this connexion the question of employment is very important. It is probably true that any job is better than no job, so long as it is within the patient's capacity—i.e., neither too hard nor too easy. In general, the best type of work for a discharged patient is that to which he is accustomed, since the resumption of habitual activities helps to compensate to some extent for a slight degree of deterioration. Unemployment leads to boredom, but has the much more serious effect of making the individual feel unwanted and that he has no niche in society. The discussion of future plans with the patient or his family is often very valuable and much appreciated; and if possible it is better to postpone discharge until suitable arrangements have been made. In many cases, of course, the patient has a job to go back to; but where this is not so, it is sometimes possible to help him to get suitable work or training.

Mental symptoms, if present, may be the cause of a great deal of distress to the patient's relatives. The commonest reaction is, "He isn't mental, is he?" We are quite sure the right way to handle this situation is to explain simply but firmly that the patient is for the time being mentally unbalanced, stressing the irresponsibility for his actions. It is often a help to try to show the kinship between physical and mental illness. There is a widespread belief among the lay public that mental illness is incurable, and that admission to a mental hospital means incarceration for life. It is often difficult to convince people otherwise, but an attempt should be made. If admission to a mental hospital becomes necessary, permission is more easily given and anxiety allayed if it is pointed out that today mental hospitals are primarily hospitals and not places of detention, and that it is possible to ask for and obtain a patient's discharge. If a patient shows much mental instability, it is imperative to make an effort to keep him in hospital until this has cleared up; occasionally it is impossible to do this, and he has to be allowed to discharge himself against advice, with the risk that he may prejudice his future prospects by his unbalanced behaviour, even though the prognosis of ultimate recovery is excellent. If a patient is being discharged with some degree of mental deterioration, it is as well to explain his limitations carefully to a responsible relative and to give some idea as to how to handle him.

What has been said so far, except for the section on mental symptoms, is applicable to most types of serious illness, but in neurosyphilis there is the additional factor of the syphilis with its moral implications. There seems to be a very understandable disinclination among doctors to tell patients or their responsible relatives the nature of the illness. We feel that whenever possible the patient should be told what is the matter; and, in view of the risk of infection of other members of the family and the consequent need of routine testing, it is helpful if the patient can be persuaded to tell his or her marital partner or allow the doctor to do so. In cases where the patient is too ill, mentally or physically, to give consent we usually tell the spouse on our own responsibility. This does not mean that every patient or relative concerned should be told everything; in dealing with a disease like syphilis it is absolutely essential to treat each case individually and to use the utmost discretion. It is important to realise that ignorance about venereal disease may be great, and the implications of tabes, or general paralysis, or even syphilis may be unappreciated. This can lead to difficulties if information is unwittingly broadcast to relatives, friends, or neighbours. We have met this catastrophe more than once.

The knowledge that the disease is venereal, even where there was previous suspicion, gives rise to considerable emotional disturbance in both the patient and his family, with which one must be prepared to deal. The most pressing need is usually an opportunity to "get it off their chests"; this entails giving them a chance to talk about the illness, to ask questions and so on, apart from the time spent on taking a history. There may be great anxiety lest other members of the family are infected or may learn the nature of the illness. It is essential to urge the necessity of doing blood tests and, if necessary, lumbar punctures on all relatives who have run the risk of infection. This in itself may help to allay one type of anxiety. An early reassurance that neurosyphilis is not contagious removes a load of often unexpressed worry. We have known cases where trained nurses have aroused this groundless fear by isolating the patient or taking precautions to protect themselves after learning the diagnosis. In other cases the only thing that can be done is to reassure about professional secrecy, but it must be borne in mind that, although it is possible to guarantee that no member of the staff will give any information, the same cannot be said for other patients and their relatives. We have had several cases where either the patient or his family has learnt the nature of the illness in this way.

The initial shock once over, the atmosphere is often a good deal clearer, and one gets increased coöperation in the treatment, a vital factor in a disease where treatment is long and tedious. Some time ago we had a certified general paralytic whose wife had been an inpatient with syphilitic ulceration of her legs. On discharge she was advised to attend as an outpatient for further treatment. She did so regularly until the blitz made travelling difficult, when she lapsed. She was seen in connexion with her husband's illness and told what was the matter. Her immediate response was "Why ever wasn't I told this before? Of course, if I had only known it was so serious I should never have left off going for treatment, however difficult it was to get there." If there is any contra-indication to explaining the exact nature of the illness, a partial explanation may prove useful, although this is not accepted at its face value so easily since the Ministry of Health started its campaign against venereal disease. People are now rather apt to jump to the right conclusion!

A point that needs mentioning is the attitude of the staff to V.D. Anyone who feels that it is a moral rather than a medicosocial question should not work in the department. The staff must be able to accept the patient as a patient. This attitude of acceptance can be most helpful, especially in cases where there is considerable emotional reaction to the V.D. A patient of ours was admitted in a great state of emotional upheaval because of this. He was bitterly ashamed of his illness, terrified that his family would get to know what was wrong, and certain that anyone who knew what was the matter would regard him as an outcast. The change in his whole demeanour when he found that he was not looked upon as a pariah but was accepted as a member of the ward community was striking. He was converted from a potentially very difficult patient into one who was coöperative and helpful, and a possible full-blown neurotic breakdown was averted.

The situation engendered by the illness with its anxiety and stress may give rise to a superadded neurosis in the patient or a potential or actual neurotic breakdown in the family. The latter not only produces another sick person but will react adversely on the original patient and still further complicate the family situation.

It is a direct benefit to the community for a sick person to be restored to the best degree of health possible, and every facility should be given for the reabsorption into employment of all the partially disabled, whether physically or mentally handicapped, who are capable of doing useful work. With this end in view it is essential that the liaison between the hospitals and the employment exchanges should be strengthened and expanded. Many adverse social conditions—e.g., the cost of treatment just at the time when the income is lowered, bad housing, congestion, lack of recreational facilities—need to be radically altered for the whole community. Efforts are made to help patients individually, but it must be recognised that, unless these reforms are carried out, any special priority given to one means, under present conditions, that he receives it at the expense of another, who may in his turn suffer through the deprivation.

ILLUSTRATIVE CASES

CASE 1.—Male, married, aged 32, was admitted in April, 1943. For the past three years he had been "making the rounds of the hospitals," feeling something was wrong with him but getting no satisfaction. About six months before admission he began to lose confidence in himself and became afraid he would have an accident and injure his passengers (he was a tram-driver). He found it difficult to convince anyone that he was ill and unfit to drive, though he was eventually transferred to point work, but by then he felt unfit to work at all. Finally his behaviour became so disordered that he was admitted to an observation ward and then transferred to us.

On admission he was at times euphoric and mildly grandiose and at others appreciated what was wrong and was anxious to be treated. He was infected with malaria and had twelve peaks of fever of 103° F or over. Immediately after treat-ient his mental symptoms became more pronounced, and e was interfering, truculent, and emotionally unstable. his abated pretty quickly and, although still rather uncertain, e responded to a simple explanation about his illness and reatment and agreed to go as a voluntary patient to a mental ospital. The desirability of attending the follow-up clinic fter his discharge was also explained to him.

He stayed in the mental hospital from July, 1943, to February, 1944. He was seen by us in November, 1943, at the request of the mental hospital. He then appeared, in view of his negligible degree of dementia and enhanced stability, rather too well adjusted to hospital life; so we recommended that an attempt should be made to find him suitable work or training through the rehabilitation department. He was therefore sent to an aftercare home in February, 1944, and arrangements were being made to place him, when he walked out leaving no address.

In April, 1944, he wrote saying it was nearly six months since his last lumbar puncture, and he thought he was due for another; so could he have an appointment? He turned up on the appointed day showing a remarkable improvement. He said that on leaving the aftercare home he had spent a couple of days putting his affairs in order and had then got a job helping on a crane. When last seen in September, 1946, he had maintained his improvement and was still holding down the same job.

This patient's coöperation was enlisted by giving him a simple individual explanation at a time when he was able to appreciate that this was done in his own interests, and that the situation demanded the coöperation that we believed he could give.

CASE 2.—Male, married, aged 62, was admitted in December, 1942. He was fairly well educated, and had his own small business. He had had lightning pains for about twelve years and had undergone a gradual change in personality during the last five or six years, becoming progressively duller, mildly suspicious, and careless about his bills. From February, 1942, he began to have frequent lapses of memory, lost his business acumen, and made serious mistakes in his estimates. His wife eventually became afraid of his driving a car or handling financial matters and insisted on his seeing a specialist.

On admission he was slow, dull, disorientated, and mildly grandiose. He was infected with malaria, having 13 peaks of fever of 103° F or over. After treatment his mental symptoms suddenly increased; he became acutely hallucinated, confused, and restless. His wife's consent was obtained for his transfer to an observation ward; but action was deferred, as he began to show signs of improvement and then rather suddenly became simple, childish, and well-behaved.

His wife, who knew the nature of the illness and whose blood was negative, was faced with the problem of his business; if he was going to recover, then she wanted to keep it if possible; if he was not going to be fit to direct it again, then she wanted to dispose of it. The position was explained to her as clearly as possible, and it was pointed out that it was impossible to give a definite prognosis. She decided to try to keep the business going for the time being.

When he finally settled down, his wife thought she could look after him at home. Fortunately he was amenable to suggestion and agreed not to touch any business affairs for at least six months but to rest and take things quietly.

Four months later, when he attended the follow-up clinic, he showed a slight improvement. His wife reported that he could make a satisfactory estimate, although he later confused the jobs. He did not attempt to interfere in any way, apparently as a part of his rest treatment.

He was seen again in April, 1944, when his wife reported a steady improvement in business capacity and said they had made a profit of £550 as against a steady loss while he was in hospital. He still, however, showed signs of slight residual deterioration—e.g., a slightly impaired memory and a mild emotional instability. He was last seen in April, 1946, and had maintained his improvement.

This case illustrates the patient's rehabilitation through his family and the importance of suitable employment. The ultimately comparatively successful outcome was due not only to the treatment but also to the able coöperation of his wife, which was enlisted by giving her a good understanding of the situation.

CASE 3.—Female, married, aged 45, a high-grade mental defective, admitted December, 1942. On admission she was emotionally unstable and slightly amnesic. She was infected with malaria and had 12 peaks of fever of 103° F or over. After treatment she became acutely psychotic, declared she was Gracie Fields and broadcast every evening, and was very confused and uncertain. This cleared up fairly quickly, and when she was discharged she was childish and mildly deteriorated but not very noticeably below her original poor level.

Her husband was a thin anxious individual with a fair degree of intelligence. He had been brought up in an institution and then gone into the Navy. He married soon after his discharge, mainly to have a home. He had not known his wife long and soon regretted the marriage. They had two children (now aged 24 and 23) very soon after marriage. About this time he contracted syphilis, had about two years' treatment, and was told he was cured. Unfortunately he infected his wife: she had some treatment and then lapsed. As a result of all this he had a markedly ambivalent attitude towards his wife, expressing remorse for his "crime," resentment at his "bad luck," and anger with his wife for not having continued her treatment, with the result that he had worried for years over the possible later effects on her. Lately he had felt numb on rising and had pain in the back of his head. He and his daughters had tests which gave negative results.

He was given a full and simple explanation about his wife's treatment and prognosis and had special interviews when visiting her and later when he brought her to the follow-up clinic. He became better able to deal with his remorse, resentment, and lack of affection for his wife. While his wife was acutely psychotic he was asked to give his consent to her certification. This produced an intense conflict, as intellectually he could see the benefit to his wife, his daughters, and himself; but his lack of affection and the realisation of the difficulties he would have to shoulder if she came home seemed to offer a method of self-punishment or expiation.

After his wife's discharge he gradually settled down. He clearly appreciated her innate limitations and shouldered all the major responsibilities in the home, but without the self-accusatory and self-punishing colouring which were so much to the fore at first, and the physical symptoms of which he complained while his wife was in hospital have disappeared.

This case illustrates the need to deal with an emotional disturbance in a member of the patient's family. If the obligation to the husband had been limited to testing his blood and cerebrospinal fluid, it is possible that his mental conflict would have resulted in a neurotic breakdown, which would have adversely affected his daughters and his working capacity and would have made the patient's chance of adjustment outside an institution very unlikely.

DISCUSSION

Medicine for a long time has concerned itself mainly with the curing of disease, but now its scope has been enlarged to include the maintenance of health. This entails the consideration of the patient as an individual and not simply as a carrier of disease; Mr. A must be Mr. A and not just a "case of hæmorrhoids." All factors that are adversely affecting him must be considered with a view to their elimination or mitigation, either by enabling him to deal with them himself or by actually removing or altering them by outside interference. In future, not only must the physician be ready to use all the medical knowledge and resources available to him but he will accept, as part of his duty, the obligation to assist "the patient, the attendants and external circumstances" to "conduce to the cure."

"Prevention is better than cure" is a popular and true slogan. It will be more often achieved if all opportunities are utilised. For instance, if a close friend or relation has been exposed to infection or to an emotional situation with which he cannot cope, an attempt should be made to arrest the trouble before it has had time to develop. Case 3 is an example where this was done successfully.

The increasing complexity of medicine means that the doctor can no longer work satisfactorily in isolation but must be a member (albeit the responsible member) of a team containing medical and non-medical personnel. It is impossible for the doctor, even if he has the time, to deal with all the social aspects of an illness, as he has not the necessary training and knowledge. This side of the illness is far better dealt with by a trained medico-social worker, working in the closest collaboration with the doctor.

Team-work and enlarging the scope of clinical medicine will open up a great field of research, embracing mental hygiene, prophylaxis, and social medicine.

CONCLUSIONS

The emphasis should be shifted from the curing of an illness to the wider conception of the promotion of optimum health. This entails the recognition of each patient as *unique;* a particular individual, in a particular family, in a particular environment.

The wider outlook means that the patient's family is included in the total picture, with the result that incipient trouble in another member of the family is more likely to be noticed and dealt with prophylactically before it further aggravates the situation.

The criterion of successful treatment is the degree of satisfactory functioning of the patient in society. This entails coöperation between medicine and social science.

We wish to thank Dr. W. D. Nicol, medical superintendent of Horton Emergency Hospital, for his interest and coöperation.

REFERENCES

MacNalty, A. S. (1943) *Practitioner*, **151**, 133.
Robinson, G. C. (1939) The Patient as a Person: a Study of the Social Aspects of Illness. Commonwealth Fund, New York.

THE USE OF REASSURANCE

T. G. ARMSTRONG
M.D. Camb., M.R.C.P.

LATE LIEUT.-COLONEL R.A.M.C.; OFFICER I/C MEDICAL DIVISION OF A GENERAL HOSPITAL

It is to be regretted that during the last fifty years of scientific progress the management and handling of patients has been neglected in the medical curriculum. The personal, and often intimate, methods of the older physicians are being replaced by highly specialised or materialistic impersonal methods.

The management of patients, though not an exact science, is, or should be, part of a discipline comprising method and technique. It can be studied and improved in the same way as other scientific disciplines. Training in this subject is necessarily more difficult than the simple acquisition of facts. Much depends on the establishment of sympathetic contact with patients, and perhaps yet more on experience. Our only training has been in the hard school of experience over many years. Much time could have been saved and long periods of sickness avoided if the principles of personal therapeutics had been taught in our medical schools.

Six years of military medicine have provided a valuable lesson in the handling of young active patients whose main desire is to get well, as opposed to older folk who often "enjoy ill health" and in whom it can even be a disservice to cure their imagined ailments. Neurosis is just as common in the Services as it is among civilians; but, owing to this desire to get well, it is much more easily treated. I intend here to show how this can be done by reassuring the patient.

VALUE OF REASSURANCE

Reassurance (by which I mean the allaying of the patient's anxiety) is of great value not only in treating neurosis but also in cases of organic disease. Fear of an existing organic disease often produces greater disability than does the disease itself. Silence, except the gravest maladies or with patients of the lowest intelligence, is inconsiderate and even dangerous. T few patients are told the cause of their complaint; t little is said of the probable duration of treatme and the ultimate outcome. I have been impressed b the value to the happiness of my patients of a fra explanation of their disease and its prognosis. I hav also been depressed by the frequency with which patient who have been previously investigated have received no indication of the nature of their malady. Curiously, this neglect has been most noticeable when the findings have been negative.

After making a diagnosis, whether of organic disea or neurosis, some doctors overtreat patients by useless methods. Lengthy treatment for incurable disabilitie is a potent cause of additional ill health. The oft repeated bottle of medicine, the continued application of physiotherapy, and the weekly certificate are poo substitutes for sympathetic explanation and encouragement to keep at work and make the best of not to bad a job. With young people simple explanation reassurance, and minor psychotherapy have been s often effective in forestalling serious invalidism an curing existing disabilities that I have thought it wort while to describe here the simple method used. It mus be emphasised that simplicity is the keynote. Th approach has always been that of the general physician and no attempt has been made to treat major psycho neurotic illnesses; nor have psycho-analytic method at any time been used.

METHOD OF REASSURANCE

The Doctor's Diagnosis.—No patient can have fu confidence in his doctor if a complete examination ha not been carried out, and no doctor can confidentl reassure his patient without having carried out such a examination. Organic disease should only be diagnose when there is reasonable proof that it is present. It i better to attribute incorrectly a small percentage of organi illnesses to functional causes than to condemn a larg number of healthy patients to the fear of a non-existen disease. If a functional disturbance is diagnosed, th doctor should appreciate his good fortune rather tha decide (as he too commonly does) that this is yet anothe piece of medical junk to be thrown on the scrap-heap o disinterest.

The Patient's Diagnosis.—What does the patient consider his malady to be? What organ does he think i diseased? What is his attitude to his condition? Wha does he fear? Does he fear a progressive illness leadin to total incapacity? The answers to these questions ar of the greatest value. Without them no real reassuranc can be given to a patient with functional disease, fo unknown fears cannot be calmed. These questions ar as important as a full physical examination; they mus be viewed "in daylight," recognised, and frankly discussed. Occasionally the patient will spontaneousl voice his fears. More often he must be questioned. I is best to ask a general question such as, "What do yo think is the matter with you?" But it may be necessar to put it in specific terms: to a patient complaining o left inframammary pain on exertion "Do you fear you heart is affected?"

A healthy soldier, aged 23, who had been regraded t category B for effort syndrome following diphtheria, continue to complain of dyspnœa, precordial pain, and palpitatio on the least exertion. Asked his opinion of the cause, h said that he thought he had permanently injured his hear Early in the first siege of Tobruk he had been admitted t hospital with faucial diphtheria and told that he must remai at complete rest in bed, as otherwise his heart might b damaged. Unfortunately, owing to extreme pressure on th orderlies, he had to get up to obtain food and to visit th latrines. He was later evacuated to the base and kept a omplete rest for six weeks; but he believed that irreparable amage had been done during the first week in Tobruk.

After specific reassurance his symptoms disappeared and o his great satisfaction he was regraded to category A1.

Other Doctors' Diagnoses.—It is always worth while in complaints of functional origin, especially those referred to the heart, to ask if any doctor has ever told the patient the nature of his illness. Opinions given by doctors always carry great weight with patients and heavily influence their opinion about themselves. A patient who has been told that he has a "strained heart" or "a little weakness of the heart" will be convinced that he has some form of heart disease. His belief will at least modify his attitude to exercise, and at the most will produce a fear—not readily expressed—of sudden death. Previous positive diagnoses are often reported by patients with heart-consciousness or effort syndrome. If such a diagnosis of organic disease remains fixed in the patient's mind and is not discussed, reassurance by a second doctor is clearly useless. Conviction of the absence of organic disease is an absolute essential for reassurance and recovery; and can only be achieved *if the final opinion is* completely accepted and the original opinion of organic disease rejected. Often the first opinion will be found to have been correct and reasonable, but to have been misinterpreted by the patient; frank discussion, and a statement that the disease which had been present at the time of the previous opinion has cleared meanwhile, will often reassure the patient.

A healthy soldier, aged 23, complained of precordial pain, palpitation, and dyspnœa on exertion. There were no abnormal signs. His regimental medical officer had told him that he had mitral stenosis and should be invalided home. He was reassured but did not get well. On direct questioning, he admitted disagreement with my reassurance; he felt that his own medical officer, who had watched him for a long time, knew his case well. He believed that his medical officer's opinion was correct and mine wrong. He refused to accept my reassurance and retained his symptoms.

Emotional Upset.—It is useful to inquire for emotional upset at or before the onset of illness. Occasionally there has been a severe mental trauma; more often a succession of minor disturbances have exerted a cumulative effect. The following case-record from civil practice is an example of a single mental trauma.

A young man, aged 19, a factory messenger, complained of three months' left inframammary pain, palpitation, and dyspnœa on exertion. These had been so severe that for the last two months his doctor had kept him off duty.

On examination he had no physical signs He was asked if anything notable had happened to him about the time of the onset of his illness. He replied, "No, I don't think so. Nothing much, except that my girl friend broke off her engagement to me." He was asked casually if he was suffering from a broken heart. He burst into emotional laughter lasting several minutes.

The situation was explained to him, and he was assured that he had no organic disease. His pain on exertion ceased abruptly after the interview. He was given a week's graduated exercises to restore his confidence, after which he returned to work, and six months later he was still at work and had no symptoms.

His illness and two months' incapacity for work could have been prevented by prompt reassurance at the onset.

Such cases are unusual; more often a succession of annoyances have impaired morale and rendered the patient conscious of minor disabilities which would not normally trouble him or induce him to report sick.

Explanation.—If organic disease has been excluded, this must be carefully explained to the patient. It is especially necessary at the outset to gain the patient's coöperation and confidence. The doctor must tell him clearly that he does not believe him to be a "lead-swinger" and must explain to him the nature of functional disease. It is useless to try to reassure a patient by telling him that there is nothing wrong with him. He knows that he is ill: his symptoms tell him so. It is equally unprofitable to tell him that he is imagining his complaint; this will injure his self-respect, suggest that he is malingering, and destroy his confidence in the doctor. The doctor must openly admit that the patient's symptoms are genuine, and must explain the reasons for the symptoms. On his ability to satisfy the patient by explanation will depend the success of treatment.

Men who have had a minor organic illness—e.g., fibrositis of the back—may, under the stress of emotional or environmental factors, persist in complaining of pain after all signs of active disease have disappeared; the pain has become a habit. Sometimes such pains are partly fostered by the continued adoption of a faulty posture originally due to attempts to ease a real pain. The explanation of such a case, followed by a short course (not more than fourteen days) of re-educative exercise, will relieve the patient's symptoms without causing him any loss of self-respect. It must be emphasised that there is no longer any organic disease, and that *the treatment prescribed is merely re-educative.* The patient should be led to believe that his symptoms are due to lack of confidence in his body, and that he is simply being taught how to cure himself.

In suitable cases, particularly in functional disturbances of the gastro-intestinal tract and of the cardiovascular system, the mechanism of emotional reaction should be simply explained. The patient should be told how emotion can alter the working of an organ and so cause real discomfort and pain. Examples should be given. It should be pointed out that everyone knows that sudden fear occasioned by a nearby explosion will cause a rise in pulse-rate in normal people. It is common for normal men in the emotional strain of waiting for an examination to experience frequency of micturition. Such examples may be given to illustrate the reaction of emotion. Stomach disorders are more complicated; but, besides mentioning the indigestion that may follow fear and the anorexia that may accompany love, it is useful to explain that direct visual observation of the interior of the stomach has established that its lining membrane becomes congested or inflamed under the influence of severe emotional stress.

In some cases it may be necessary to explain to the patient that a person who believes he has a disease unconsciously focuses his attention on the incriminated organ and becomes, for example, heart-conscious or stomach-conscious. In other words, he becomes unduly sensitive to normal reactions in those organs.

Final Reassurance.—In pure functional disorders it should be stated, emphatically and without any "hedging" or the expression of any doubt, that no organic disease exists. There must be no room in the patient's mind for any doubt about the doctor's opinion. The doctor should also find out if the patient has accepted his opinion. If the patient has not done so, further explanation may be necessary. If, in spite of this, the patient still refuses to accept the doctor's opinion and makes some such remark as "But why do I get this pain?" the prognosis is bad.

OTHER TREATMENT

As a rule, in the absence of organic disease, specific treatments should not be ordered. But in some cases such treatment is useful for saving self-respect, restoring confidence, and maintaining coöperation. In such cases *the adjuvant treatment* should aim at progress and not rest. Rest in bed is recommended too often and for too long; it fosters the belief in a serious disease. It should be made clear to the patient that the treatment is not meant to counteract a disease but to assist his natural resources. To a man with functional backache graduated exercises are important; being out of training he must readjust himself gradually, and if he does too but must be a member (albeit the responsible member) of a team containing medical and non-medical personnel. It is impossible for the doctor, even if he has the time, to deal with all the social aspects of an illness, as he has not the necessary training and knowledge. This side of the illness is far better dealt with by a trained medico-social worker, working in the closest collaboration with the doctor.

Team-work and enlarging the scope of clinical medicine will open up a great field of research, embracing mental hygiene, prophylaxis, and social medicine.

CONCLUSIONS

The emphasis should be shifted from the curing of an illness to the wider conception of the promotion of optimum health. This entails the recognition of each patient as *unique*; a particular individual, in a particular family, in a particular environment.

The wider outlook means that the patient's family is included in the total picture, with the result that incipient trouble in another member of the family is more likely to be noticed and dealt with prophylactically before it further aggravates the situation.

The criterion of successful treatment is the degree of satisfactory functioning of the patient in society. This entails coöperation between medicine and social science.

We wish to thank Dr. W. D. Nicol, medical superintendent of Horton Emergency Hospital, for his interest and coöperation.

REFERENCES

MacNalty, A. S. (1943) *Practitioner*, 151, 133.
Robinson, G. C. (1939) The Patient as a Person: a Study of the Social Aspects of Illness. Commonwealth Fund, New York.

THE USE OF REASSURANCE

T. G. ARMSTRONG
M.D. Camb., M.R.C.P.
LATE LIEUT.-COLONEL R.A.M.C.; OFFICER I/C MEDICAL DIVISION OF A GENERAL HOSPITAL

IT is to be regretted that during the last fifty years of scientific progress the management and handling of patients has been neglected in the medical curriculum. The personal, and often intimate, methods of the older physicians are being replaced by highly specialised or materialistic impersonal methods.

The management of patients, though not an exact science, is, or should be, part of a discipline comprising method and technique. It can be studied and improved in the same way as other scientific disciplines. Training in this subject is necessarily more difficult than the simple acquisition of facts. Much depends on the establishment of sympathetic contact with patients, and perhaps yet more on experience. Our only training has been in the hard school of experience over many years. Much time could have been saved and long periods of sickness avoided if the principles of personal therapeutics had been taught in our medical schools.

Six years of military medicine have provided a valuable lesson in the handling of young active patients whose main desire is to get well, as opposed to older folk who often "enjoy ill health" and in whom it can even be a disservice to cure their imagined ailments. Neurosis is just as common in the Services as it is among civilians; but, owing to this desire to get well, it is much more easily treated. I intend here to show how this can be done by reassuring the patient.

VALUE OF REASSURANCE

Reassurance (by which I mean the allaying of the patient's anxiety) is of great value not only in treating neurosis but also in cases of organic disease. Fear of an existing organic disease often produces greater disability than does the disease itself. Silence, even the gravest maladies or with patients of the intelligence, is inconsiderate and even dangerous. few patients are told the cause of their complaint; little is said of the probable duration of treat- and the ultimate outcome. I have been impressed the value to the happiness of my patients of a explanation of their disease and its prognosis. I also been depressed by the frequency with which patients who have been previously investigated have recei no indication of the nature of their malady. Curio this neglect has been most noticeable when the findings have been negative.

After making a diagnosis, whether of organic disease or neurosis, some doctors overtreat patients by useless methods. Lengthy treatment for incurable disabilities is a potent cause of additional ill health. The repeated bottle of medicine, the continued applicati of physiotherapy, and the weekly certificate are poor substitutes for sympathetic explanation and encourage- ment to keep at work and make the best of not bad a job. With young people simple explanation, reassurance, and minor psychotherapy have been so often effective in forestalling serious invalidism and curing existing disabilities that I have thought it worth while to describe here the simple method used. It must be emphasised that simplicity is the keynote. The approach has always been that of the general physician, and no attempt has been made to treat major psychoneurotic illnesses; nor have psycho-analytic methods at any time been used.

METHOD OF REASSURANCE

The Doctor's Diagnosis.—No patient can have full confidence in his doctor if a complete examination has not been carried out, and no doctor can confidently reassure his patient without having carried out such an examination. Organic disease should only be diagnosed when there is reasonable proof that it is present. It is better to attribute incorrectly a small percentage of organic illnesses to functional causes than to condemn a large number of healthy patients to the fear of a non-existent disease. If a functional disturbance is diagnosed, the doctor should appreciate his good fortune rather than decide (as he too commonly does) that this is yet another piece of medical junk to be thrown on the scrap-heap of disinterest.

The Patient's Diagnosis.—What does the patient consider his malady to be? What organ does he think is diseased? What is his attitude to his condition? What does he fear? Does he fear a progressive illness leading to total incapacity? The answers to these questions are of the greatest value. Without them no real reassurance can be given to a patient with functional disease, for unknown fears cannot be calmed. These questions are as important as a full physical examination; they must be viewed "in daylight," recognised, and frankly discussed. Occasionally the patient will spontaneously voice his fears. More often he must be questioned. It is best to ask a general question such as, "What do you think is the matter with you?" But it may be necessary to put it in specific terms: to a patient complaining of left inframammary pain on exertion "Do you fear your heart is affected?"

A healthy soldier, aged 23, who had been regraded to category B for effort syndrome following diphtheria, continued to complain of dyspnœa, precordial pain, and palpitation on the least exertion. Asked his opinion of the cause, he said that he thought he had permanently injured his heart. Early in the first siege of Tobruk he had been admitted to hospital with faucial diphtheria and told that he must remain at complete rest in bed, as otherwise his heart might be damaged. Unfortunately, owing to extreme pressure on the orderlies, he had to get up to obtain food and to visit the latrines. He was later evacuated to the base and kept at omplete rest for six weeks: but he believed that irreparable amage had been done during the first week in Tobruk.

After specific reassurance his symptoms disappeared and o his great satisfaction he was regraded to category A1.

Other Doctors' Diagnoses.—It is always worth while in omplaints of functional origin, especially those referred o the heart, to ask if any doctor has ever told the patient the nature of his illness. Opinions given by doctors always carry great weight with patients and heavily influence their opinion about themselves. A patient who has been told that he has a "strained heart" or "a little weakness of the heart" will be convinced that he has some form of heart disease. His belief will at least modify his attitude to exercise, and at the most will produce a fear—not readily expressed—of sudden death. Previous positive diagnoses are often reported by patients with heart-consciousness or effort syndrome. If such a diagnosis of organic disease remains fixed in the patient's mind and is not discussed, reassurance by a second doctor is clearly useless. Conviction of the absence of organic disease is an absolute essential for reassurance and recovery; and can only be achieved if the final opinion is completely accepted and the original opinion of organic disease rejected. Often the first opinion will be found to have been correct and reasonable, but to have been misinterpreted by the patient; frank discussion, and a statement that the disease which had been present at the time of the previous opinion has cleared meanwhile, will often reassure the patient.

A healthy soldier, aged 23, complained of precordial pain, palpitation, and dyspnœa on exertion. There were no abnormal signs. His regimental medical officer had told him that he had mitral stenosis and should be invalided home. He was reassured but did not get well. On direct questioning, he admitted disagreement with my reassurance; he felt that his own medical officer, who had watched him for a long time, knew his case well. He believed that his medical officer's opinion was correct and mine wrong. He refused to accept my reassurance and retained his symptoms.

Emotional Upset.—It is useful to inquire for emotional upset at or before the onset of illness. Occasionally there has been a severe mental trauma: more often a succession of minor disturbances have exerted a cumulative effect. The following case-record from civil practice is an example of a single mental trauma.

A young man, aged 19, a factory messenger, complained of three months' left inframammary pain, palpitation, and dyspnœa on exertion. These had been so severe that for the last two months his doctor had kept him off duty.

On examination he had no physical signs. He was asked if anything notable had happened to him about the time of the onset of his illness. He replied, "No, I don't think so. Nothing much, except that my girl friend broke off her engagement to me." He was asked casually if he was suffering from a broken heart. He burst into emotional laughter lasting several minutes.

The situation was explained to him, and he was assured that he had no organic disease. His pain on exertion ceased abruptly after the interview. He was given a week's graduated exercises to restore his confidence, after which he returned to work, and six months later he was still at work and had no symptoms.

His illness and two months' incapacity for work could have been prevented by prompt reassurance at the onset.

Such cases are unusual; more often a succession of annoyances have impaired morale and rendered the patient conscious of minor disabilities which would not normally trouble him or induce him to report sick.

Explanation.—If organic disease has been excluded, this must be carefully explained to the patient. It is especially necessary at the outset to gain the patient's coöperation and confidence. The doctor must tell him clearly that he does not believe him to be a "lead-swinger" and must explain to him the nature of functional disease. It is useless to try to reassure a patient by telling him that there is nothing wrong with him. He knows that he is ill: his symptoms tell him so. It is equally unprofitable to tell him that he is imagining his complaint; this will injure his self-respect, suggest that he is malingering, and destroy his confidence in the doctor. The doctor must openly admit that the patient's symptoms are genuine, and must explain the reasons for the symptoms. On his ability to satisfy the patient by explanation will depend the success of treatment.

Men who have had a minor organic illness—e.g., fibrositis of the back—may, under the stress of emotional or environmental factors, persist in complaining of pain after all signs of active disease have disappeared; the pain has become a habit. Sometimes such pains are partly fostered by the continued adoption of a faulty posture originally due to attempts to ease a real pain. The explanation of such a case, followed by a short course (not more than fourteen days) of re-educative exercise, will relieve the patient's symptoms without causing him any loss of self-respect. It must be emphasised that there is no longer any organic disease, and that the treatment prescribed is merely re-educative. The patient should be led to believe that his symptoms are due to lack of confidence in his body, and that he is simply being taught how to cure himself.

In suitable cases, particularly in functional disturbances of the gastro-intestinal tract and of the cardiovascular system, the mechanism of emotional reaction should be simply explained. The patient should be told how emotion can alter the working of an organ and so cause real discomfort and pain. Examples should be given. It should be pointed out that everyone knows that sudden fear occasioned by a nearby explosion will cause a rise in pulse-rate in normal people. It is common for normal men in the emotional strain of waiting for an examination to experience frequency of micturition. Such examples may be given to illustrate the reaction of emotion. Stomach disorders are more complicated; but, besides mentioning the indigestion that may follow fear and the anorexia that may accompany love, it is useful to explain that direct visual observation of the interior of the stomach has established that its lining membrane becomes congested or inflamed under the influence of severe emotional stress.

In some cases it may be necessary to explain to the patient that a person who believes he has a disease unconsciously focuses his attention on the incriminated organ and becomes, for example, heart-conscious or stomach-conscious. In other words, he becomes unduly sensitive to normal reactions in those organs.

Final Reassurance.—In pure functional disorders it should be stated, emphatically and without any "hedging" or the expression of any doubt, that no organic disease exists. There must be no room in the patient's mind for any doubt about the doctor's opinion. The doctor should also find out if the patient has accepted his opinion. If the patient has not done so, further explanation may be necessary. If, in spite of this, the patient still refuses to accept the doctor's opinion and makes some such remark as "But why do I get this pain?" the prognosis is bad.

OTHER TREATMENT

As a rule, in the absence of organic disease, specific treatments should not be ordered. But in some cases such treatment is useful for saving self-respect, restoring confidence, and maintaining coöperation. In such cases the adjuvant treatment should aim at progress and not rest. Rest in bed is recommended too often and for too long; it fosters the belief in a serious disease. It should be made clear to the patient that the treatment is not meant to counteract a disease but to assist his natural resources. To a man with functional backache graduated exercises are important: being out of training he must readjust himself gradually, and if he does too much he will become stiff. Barbiturates are invaluable for inducing sleep in anxious and nervous patients. The *treatment should be short, rarely more than two or three weeks. If no progress has been made at the end of this time it never will be, and continuance of treatment will merely foster belief in its necessity.*

SUMMARY

Reassurance, or the allaying of the patient's anxiety, is of great value not only in neurosis but also in organic disease by removing ill-founded fears.

For reassurance to take effect, the patient must have complete confidence in the doctor, and the doctor complete confidence in his diagnosis. This is best done, in psychogenic cases, by explaining to the patient the mechanism involved.

Adjuvant therapy must be short, to avoid suggesting to the patient that he has a serious disease; and it must be aimed at re-education of the patient.

My thanks are due to Prof. J. A. Ryle for much helpful criticism and advice.

THE POST-HEPATITIS SYNDROME

SHEILA SHERLOCK, M.D. Edin., M.R.C.P.
BEIT MEMORIAL RESEARCH FELLOW

VERYAN WALSHE,* B.Sc. Lond.

From the Department of Medicine, British Postgraduate Medical School, London

Caravati (1944) has described cases of persistent disability following postvaccinial (yellow fever) hepatitis and has designated the condition the "post-hepatitis syndrome."

Benjamin and Hoyt (1945) report a similar series, and during the past two years we have studied a group of soldiers in whom symptoms and usually an enlarged liver have remained after clinical recovery from acute hepatitis. Besides studying the clinical features and making biochemical investigations, we have used the aspiration technique of liver biopsy to study hepatic histology. At the present time, when so many men who have had hepatitis are returning to civilian life, it seems important to report the findings.

Our 20 patients were soldiers of the British, Canadian, and Czechoslovak Armies. All were grade A before contracting acute hepatitis. In 18 the hepatitis was of the simple "infective" type; in 2 it had followed arsenotherapy for syphilis.

The laboratory methods used were the estimation of serum-bilirubin, cholesterol, alkaline phosphatase (King and Armstrong 1934), and total and differential serum proteins. The colloidal-gold reaction (Maclagan 1944), the bromsulphthalein test with a 5 mg./kg. dose and taking 5-min. and 30-min. samples (Helm and Machella 1942), and the intravenous hippuric-acid test (Sherlock 1946a) were also used. Routine urine examination included urobilinogen by Ehrlich's aldehyde reagent, and bilirubin by Hunter's test (Pollock 1945).

Aspiration liver biopsy was performed by the method previously described (Sherlock 1945).

FEATURES OF THE DISORDER

The presenting features were as follows:

	No. of cases		*No. of cases*
Fatigue	18	Fat-tolerance ..	6
Weight-loss	11	Relapse of hepatitis..	8
Anorexia	12	Palpable liver ..	16
Abdominal discomfort	10	Palpable spleen ..	3

Preceding Hepatitis and Relapses.—Of the 20 patients 6 had had more than one acute attack of hepatitis; 1 patient was said to have had six. The last acute episode took place 2–24 months previously.

Symptoms.—The usual complaint was lack of energy and exhaustion on minimal exertion. Inability to regain the weight lost during the acute attack was common. Gastro-intestinal symptoms were prominent; some patients had a poor and variable appetite, with sometimes an aversion to fatty foods. The men were very faddy about their diet. Right upper abdominal discomfort, often aggravated by exertion, was occasionally present.

Consumption of Alcohol.—Of the 20 patients 10 confessed to excessive alcohol intake, 6 took moderate amounts, and 4 were almost teetotal.

Mental State.—A detailed psychiatric examination was not attempted. The British patients were on the whole psychologically ill-balanced. They were extremely introspective and unduly apprehensive about their livers. One was an Army deserter, another had just been invalided from the Services with "effort syndrome." The Canadian group showed better understanding of their symptoms. All, however, had been warded together, and a similarity in the wording of their case-histories was often noticed. Moreover, they were *in hospital* at the end of European hostilities, when there was *delay in* repatriation to Canada, and it was believed that sick men would receive priority.

General Examination.—Despite the complaint of weight-loss, the general development of the group was excellent. Spider angiomata were not seen.

Hepatomegaly.—The most common positive finding was hepatomegaly. The liver edge, smooth and rubbery in consistence, could be felt on inspiration 2–7 cm. below the right costal margin in the nipple line. Tenderness was not present. Liver tenderness on fist percussion over the right lower ribs (Barker et al. 1945) was not elicited.

Splenomegaly.—In 3 patients the spleen could just be palpated under the left costal margin.

Urine Analysis.—This was usually normal, but 5 *patients showed a trace of urobilinogen in an* early morning specimen of urine. Hunter's test for bilirubin was consistently negative.

Biochemical Investigations.—In every patient the serum-bilirubin, the total and differential serum proteins, and the bromsulphthalein test were normal. The serum-cholesterol level was high in 7 cases; in 3 of these it was greater than 300 mg. per 100 ml. Slight changes among the other estimations were a serum-phosphatase of 14 units per 100 ml. in one patient, a weakly positive colloidal-gold reaction in two patients, and in a further two cases the excretion of hippuric acid was at the lower limit of normal (0·7 g. as sodium benzoate). The biochemical observations on the whole, therefore, gave essentially normal results. Caravati (1944) found a low fasting blood-sugar level and flat oral glucose-tolerance curves in some of his patients. Glucose-tolerance tests were performed in 5 of our subjects and gave normal results.

Hepatic Histology.—There was no evidence *of* continuing hepatitis or of cirrhosis. The lobular pattern was not disturbed. The hepatic cells were usually normal and contained their normal complement of glycogen. In 2 instances the glycogen was slightly deficient, and in another there was patchiness of glycogen. Iron was absent both from the Kupffer and the hepatic cells. In one patient who had previously had *malaria*, there was iron in both situations. In ten sections some excess of fat was seen in the liver-cells. It usually took the form of scattered fine droplets evenly distributed through the lobules. In another case the fat was peripheral. Slight fatty change was the only abnormality encountered with any frequency. The Kupffer cells were normal. In 3 patients, all within three months of the initial attack of hepatitis, excess of fibrous tissue was seen in the portal tracts. The picture here resembled *residual* portal scarring following hepatitis (Dible et al. 1943).

---

* In receipt of a maintenance grant from the Medical Research Council, who have also defrayed the expenses of this investigation.

ILLUSTRATIVE CASE-RECORDS

CASE 1.—A British officer, aged 31, was fit until October, 1943, when he had infective hepatitis in Libya. He was jaundiced three months and lost two stone in weight. He was invalided home in April, 1944. Since the hepatitis he had had persistent right upper abdominal discomfort, made worse by exercise. Fatty foods caused nausea and flatulence. Appetite was variable. There was exhaustion on walking only half a mile, and some dyspnœa on exertion. In October, 1944, he was again slightly jaundiced and in bed a week. He was a moderate drinker of alcohol.

On examination (March 10, 1945) he was a tall well-developed man, not jaundiced. The smooth rounded liver edge could be palpated 6 cm. below the right costal margin. Tenderness was not present. The spleen was not felt. Urine analysis was normal. The biochemical investigations were normal. Aspiration liver-biopsy sections showed normal liver histology (fig. 1).

This patient was extremely introspective and worried about his health. He had had advice from many doctors, both Army and private, before the present investigation. Even when he was told that his liver was normal the symptoms persisted.

CASE 2.—A Canadian N.C.O., aged 31, had had infective hepatitis at 16 years of age, when he was jaundiced a month. In September, 1944, in Italy, while having arsenotherapy for syphilis, he again became jaundiced for three weeks. The symptoms were those of acute hepatitis.

Since then he had complained of lack of energy and dyspnœa on exertion. The appetite was poor and there was much heartburn and gastric flatulence. During the jaundice the patient lost a stone in weight; this had not been regained. In May, 1945, there was a further attack of hepatitis; jaundice lasted about a week. The symptoms persisted. Cholecystograms were normal. Patient drank a lot of beer, usually six pints a night, with extra beer and spirits at the week-end; this had continued to the date of this investigation (July, 1945).

On examination he looked well. He was not underweight. The liver was palpable 4 cm. below the right costal margin. The spleen was not felt. Urine analysis was normal. The only abnormal biochemical finding was a serum-cholesterol level of 309 mg./100 ml.

Aspiration liver-biopsy sections showed a slight excess of fat within the hepatic cells at the periphery of the lobules; the portal tracts contained a little excess fibrous tissue and showed some round-celled infiltration (fig. 2).

The repeated attacks of jaundice had made both the patient and his medical advisers suspect permanent liver damage. When the present investigation showed this not to be the case he was much relieved and became symptom-free.

DISCUSSION

In the group studied there is no causal relationship between the slight biochemical and the hepatic histological changes and the symptoms. Similar findings have been observed in patients now symptom-free but within six months of clinical recovery from acute hepatitis. In 10 of 15 such subjects the liver was still palpable. Hepatic sections usually showed portal-tract scars, and in 7 excess fat was present in the liver-cells. A raised serum-cholesterol level is also sometimes found during recovery from hepatitis (Sherlock 1946b). Benjamin and Hoyt (1945) believe that the symptoms may have a psychotic basis; the psychoneurotic patterns observed in our patients were very similar to those recorded by these authors. Acute hepatitis is nearly always an unpleasant experience. It usually lasts a minimum of 3–4 weeks. Convalescence is slow. If the illness relapses, as it did in many of this group, fear may arise of further attacks and of permanent liver damage. This is accentuated if a number of men are warded together and repeatedly examined with a view to determining liver size. The condition has not been seen in civilian patients. It is commoner in those serving overseas. Some men feel the disease may provide an opportunity for repatriation. In the type of person affected the condition is somewhat analogous to "effort syndrome," with symptoms focused on the liver and gastro-intestinal tract rather than the heart.

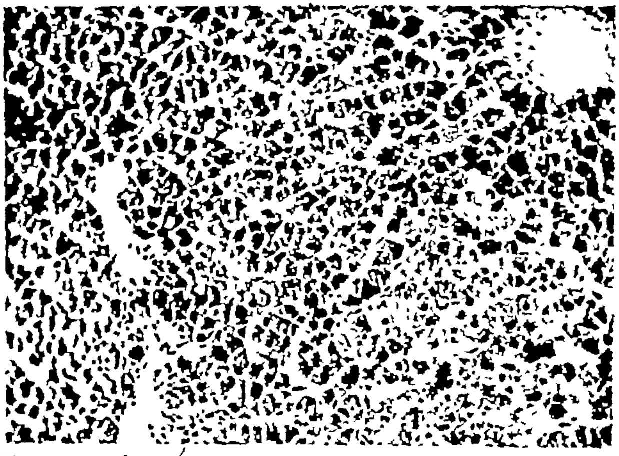


Fig. 1—Normal hepatic structure. Case 1. Best's carmine stain. (× 120.)

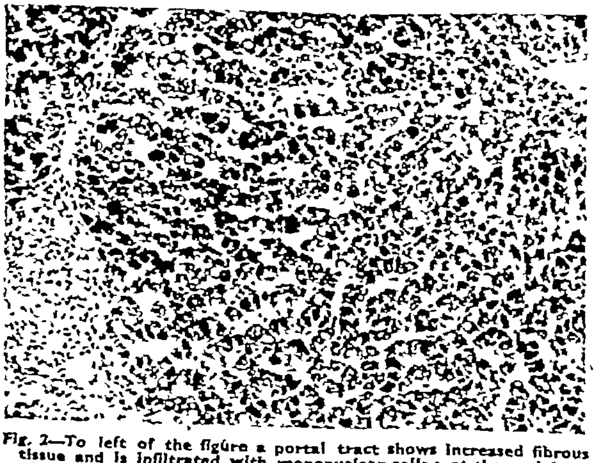


Fig. 2—To left of the figure a portal tract shows increased fibrous tissue and is infiltrated with mononuclear cells; at the periphery of the lobule the hepatic cells show slight fatty change. Case 2. Best's carmine stain. (× 120.)

The hepatomegaly may in some instances be related to the histological picture of fatty change and residual portal-tract scarring. A more likely cause is the downward displacement of a normal-sized liver by the diaphragm. Some patients, with practice, become very efficient at "pushing down the liver." On inspiration the lower liver edge has been observed to move down 6 cm. in one of these patients; an impalpable liver is thus easily felt. Similar considerations apply to the spleen. Moreover, a palpable liver, usually but not constantly due to downward displacement, is not uncommon in normal subjects. On ten occasions such a liver has been subjected to aspiration biopsy with entirely normal results.

The importance of the syndrome is in its distinction from the serious organic sequelæ known rarely to occur after hepatitis (Krarup and Roholm 1941, Dible et al. 1943, Rennie 1945). We have studied 6 patients in whom cirrhosis could be related to a preceding acute hepatitis: 1 showed hepatomegaly, splenomegaly, and abnormal results for all the biochemical methods used; 2 were symptom-free and presented only hepatomegaly; the remaining 3 had clinical features and biochemical findings identical with the series now reported. Clinical and laboratory findings cannot constantly distinguish organic from possibly psychogenic sequelæ; but a definite conclusion can usually be reached after study of aspiration liver-biopsy sections. The importance of this method is emphasised. All the patients volunteered for this procedure and usually derived great benefit from the reassurance possible when results were known.

This sequel of hepatitis may be prevented if patients with the same condition are not herded together. Patients apparently recovering normally should not be examined too often. The condition is unlikely to occur with any frequency in civilians. Treatment consists in reassurance after the fullest possible investigation.

SUMMARY

In 20 patients fatigue and gastro-intestinal symptoms arose, usually with hepatomegaly, after acute hepatitis.

Serum-bilirubin, phosphatase, and differential protein estimations, the colloidal-gold reaction, the intravenous hippuric-acid test, and the bromsulphthalein test showed no abnormalities. There was an occasional rise in serum-cholesterol level.

Hepatic sections obtained by aspiration biopsy were usually normal. In some sections slight fatty change in the liver-cells and occasional scarring in the portal tracts could be seen.

No difference was found between these results and those obtained in subjects who had recovered from acute hepatitis and were now symptom-free.

The possible psychogenic basis of the symptoms is discussed.

The palpable liver seems due to downward displacement of the liver edge rather than to enlargement.

The value of aspiration liver biopsy in the diagnosis of this syndrome from post-hepatitis cirrhosis is emphasised.

We are indebted to Major-General A. G. Biggam, and Lieut.-Colonels W. R. M. Drew and W. H. Hargreaves, of the R.A.M.C., and Brigadier Palmer and Major B. N. Fahni, of the R.C.A.M.C., for many of the cases studied; to Mr. E. V. Willmott for the photomicrographs; and to Mr. D. Bull for the histological preparations.

REFERENCES

Barker, M. H., Capps, R. B., Allen, F. W. (1945) *J. Amer. med. Ass.* 128, 997.
Benjamin, J. E., Hoyt, R. C. (1945) *Ibid*, p. 319.
Caravati, C. M. (1944) *Sth. med. J., Alabama*, 37, 251.
Dible, J. H., McMichael, J., Sherlock, S. P. V. (1943) *Lancet*, ii, 402.
Helm, J. D., Machella, T. E. (1942) *Amer. J. digest. Dis.* 9, 141.
King, E. J., Armstrong, A. R. (1934) *Canad. med. Ass. J.* 31, 376.
Krarup, N. B., Roholm, K. (1941) *Nord. Med. (Hospitalstid.)* 10, 1991.
Maclagan, N. F. (1944) *Brit. J. exp. Path.* 25, 15.
Pollock, M. R. (1945) *Lancet*, ii, 626.
Rennie, J. B. (1945) *Amer. J. med. Sci.* 210, 18.
Sherlock, S. (1945) *Lancet*, ii, 397.
— (1946a) *Ibid*, i, 159.
— (1946b) in the press.

PATHOLOGY OF POSTANAL PILONIDAL SINUS

ITS BEARING ON TREATMENT

DAVID H. PATEY
M.S. Lond., F.R.C.S.
SURGEON, THE MIDDLESEX HOSPITAL, LONDON

R. W. SCARFF
M.B. Lond.
PROFESSOR OF MORBID ANATOMY AND HISTOLOGY IN THE UNIVERSITY OF LONDON

From the Wards and the Bland-Sutton Institute of Pathology, The Middlesex Hospital, London

PILONIDAL sinus, or postanal dermoid, is found chiefly in young adults, especially in the Services, where unhygienic conditions may be important contributory factors (Davies and Starr 1945).

The length of treatment often necessary for cure becomes a special worry when there is a shortage of man-power, and in many papers, particularly in America, the most striking note is dissatisfaction with the uncertain results of treatment (*British Medical Journal* 1944, Peterson and Ames 1944, Sher 1944, Kooistra 1942). Theis and Rusher (1944) even advise against operation for pilonidal sinus on Service personnel wherever possible.

Dissatisfaction with the position is also reflected in the variety of surgical procedures advocated—e.g., the different methods of demonstrating the tracks and excising them when demonstrated, leaving the wounds open to granulate and epithelise secondarily (Goodsall and Miles 1900, Gabriel 1945); the different methods of primary suture; and various forms of flap closure, such as the Estlander rotation flap (Davies and Starr 1945). Shute et al. (1943) review some of the technical methods used.

The unsatisfactory results of treatment have, however, led to no real questioning of the correctness of the standard view of the ætiology—i.e., that pilonidal sinus *is primarily a developmental condition* on which infection has become superimposed. But there has been some speculation about the origin and nature of the developmental abnormality (Peterson and Ames 1944). It is usually regarded as a sequestration dermoid; hence its alternative name of infected postanal dermoid. This view implies that surgical excision of the congenital track should lead to cure; *but often this does not happen.* We have therefore reconsidered the developmental theory and sought some other explanation.

THE DEVELOPMENTAL THEORY

The main evidence for the developmental theory is *(1) that the postanal site is a recognised site for developmental abnormalities*, and (2) that in a fair proportion of cases a dermoid origin is suggested by the presence of epithelial lining, hairs, hair follicles, and sebaceous glands.

(1) *Postanal Site.*—Raven (1935) collected from the pathological museums of London 16 sacrococcygeal cysts and tumours, which most pathologists would consider to be developmental in origin, though they might disagree about the exact derivation. But there is a world of difference between this undoubted developmental condition and a typical pilonidal sinus. The former is situated between the rectum and coccyx, is often first noted in early life, and is rarely the site of secondary infection; whereas the pilonidal sinus is a subcutaneous lesion of the intergluteal cleft, first appears in young adult life, and almost invariably presents as an infected lesion.

Out of 23 cases at the Middlesex Hospital only 2 were of undoubted developmental origin: one in a woman, aged 45 was a typical dermoid cyst extending high up between the rectum and sacrum, lined with skin, hairs, hair follicles and sebaceous glands, and full of inspissated sebaceous material; the other in a woman, aged 24, was a multilocular cyst in the same position, which had been known to have been present since birth and contained, among other tissues, skin with accessory skin structures and cysts lined with columnar epithelium.

Another reason against assessing too highly the argument that the postanal region is a recognised site for developmental abnormalities is that an uninfected sequestration dermoid in the situation of pilonidal sinus is practically never encountered; whereas, if it were the invariable precursor of an infected phase represented by pilonidal sinus, it should be more common. A post-anal dimple is common, but an infective lesion may be directly superimposed on this without the necessity of postulating an intermediate sequestration dermoid.

(2) *Histology.*—The histological appearances of pilonidal sinus have been fully studied and reported. What is usually regarded as the typical picture is a track whose superficial part is lined with *squamous epithelium*, sometimes dilated to form a small cyst, and whose deeper part is lined with *granulation tissue only*. The usual explanation is that the deeper part of the track has lost its original epithelium as a result of the infection (Kooistra 1942); an alternative explanation is that it is a secondary purely infective track developing from the original developmental track. Sometimes no epithelium is found, the track being lined with granulation tissue only, the assumption on the developmental theory being that the epithelium in this case has been completely destroyed. Of the remaining 21 cases of the

Middlesex Hospital series, in 8 only was an epithelial lining demonstrated on routine microscopical section: in the remaining 13 the track was lined with granulation tissue only.

Hairs are more often demonstrated, sometimes macroscopically but more often microscopically. Kooistra (1942) found hairs in just over half of his 89 cases, and in our series of 21 we found hairs in 10.

The exact incidence of *hair follicles* is more difficult to determine, as it is sometimes difficult to decide whether an odd structure surrounded by granulation tissue represents a degenerated follicle or not; but the frequency is certainly much less than that of hairs. Kooistra (1942) found them in only 9% of his cases. In our series, counting as positive every case in which there was the suspicion of a degenerated follicle, we found follicles in 6 out of the 21 cases. In several of these the suspicious follicle was solitary.

Sebaceous glands are much less common. We found none. Kooistra gives an illustration of one example.

The question for decision is whether the presence of the epithelium and structures derived from epithelium in certain cases is conclusive proof of a developmental origin, or whether there is any alternative explanation of their presence.

Sebaceous glands deep in the track are almost conclusive evidence of a sequestration dermoid. But, as we have already stated, this finding is extremely rare and was not present in our series. Sebaceous glands near the opening of the track on the skin might be derived from the surface skin or a postanal dimple.

An *epithelial lining* is not conclusive evidence of a developmental origin. A downgrowth of epithelium along a track lined with granulation tissue to form a deeper epithelial-lined cyst is a well-recognised pathological process and is one of the standard theories invoked to explain, for example, cholesteatoma of the middle ear, and dental cyst. There is also the possibility of the epithelium being implanted by puncture—i.e., implantation dermoid.

Hairs in the track are not necessarily derived from the lining; they might be surface hairs which have penetrated deeply either primarily or secondarily into an already established infective sinus.

Definite *hair follicles* in any number are strong evidence for a sequestration dermoid, but an occasional hair follicle might be implanted (Muir 1941).

Therefore it is only in a very small proportion of cases of pilonidal sinus that evidence from the presence of epithelium or structures derived from epithelium is conclusive or even very strong evidence of a developmental origin; in most cases there are other possible explanations. In other words, though the evidence for the occasional origin of pilonidal sinus in a sequestration dermoid cannot be denied, in most cases there is no incontrovertible evidence of such origin.

RECURRENCES

The developmental theory assumes that, if there is a recurrence, the original track has not been excised completely. But there is a growing feeling that many recurrences cannot be explained on this basis. Barnett (1944) attributes many recurrences to the situation of the lesion in the intergluteal fold, where debris of clothing, lint, hair, and epithelial scales tends to accumulate. Other surgeons attribute recurrence to failure to control infection or to obliterate dead spaces. Davies and Starr (1945) comment on the frequency with which the local application of acridine compounds to the wound after the primary operation leads to recurrence.

But the histology of the excised recurrent sinus does not differ from that of primary pilonidal sinus. Kooistra (1942) found hairs in the tracks in 9 out of 12 recurrent cases. In one case we excised, apparently completely, a primary track which histologically proved to be lined with granulation tissue, with remains of dead hairs in the walls. A recurrent sinus, longer than the primary, developed and was excised. This too was lined with granulation tissue, with dead hairs along the whole length. We were prepared to admit the possibility that in spite of appearances we had left behind a small portion of the primary track. We found it almost impossible to believe that we had left behind, in the same position as the primary track, another even longer track. In another case section of the excised primary track showed a lining of granulation tissue containing hairs; and section of an excised secondary track developing some years later showed an epithelium-lined track containing hairs. It is difficult to avoid the conclusion that some recurrences at any rate are due to some other factor or factors than the leaving behind of a portion of the primary track at operation. And, if these factors can lead to the development of a recurrent track histologically identical with the primary track, may they not also have been the cause of the primary track?

OTHER POSSIBLE CAUSAL FACTORS

In searching for other possible causal factors, a convenient point to start from is the most characteristic twofold feature of pilonidal sinus—the presence of infection and hairs. Either the infection is primary and the hairs are secondary, or the hairs may be the primary cause of the infection.

Primary Infection.—A primary infective origin is supported by the increased incidence in the Services. The intergluteal fold is a region in which infective debris tends to accumulate, and possibly the special incidence in young adults is related to changes in the sweat and sebaceous secretions at this age. The final factor of infection might be gross trauma, such as a fall (Goodsall and Miles 1900), but is more probably the minor trauma of the rubbing together of the buttocks during exercise. An infective sinus once established, hairs and epithelial debris would tend to enter from the depths of the intergluteal fold. This would also explain recurrences.

Hairs.—That hairs might be the direct cause does not seem to have been seriously considered. The condition has been noted particularly in hairy people (Gabriel 1945, Barnett 1944), and we have noted it in some people who were more hairy than normal. But this is not necessarily so and in any case is difficult to prove. Kooistra (1942), who accepts the developmental theory, mentions that Warren (1854) had suggested hairs, inverted on themselves in the follicle, as the cause. But, looking up the reference, we did not confirm this but found instead the statement: "It would seem probable that originally the hair was contained in a cyst."

The fact that epilation doses of X rays (Smith 1937, Turell 1940, Sher 1944) may be of value both preoperatively and in the treatment of recurrence is strong evidence for the causal rôle of hair in the recurrent sinus. And hair might also play a causal rôle in the production of the primary sinus by puncturing the skin and either introducing infection alone or carrying in a small piece of surface skin, thus causing an implantation dermoid. Hairs as a cause of pilonidal sinus cannot therefore be dismissed.

SIMILAR LESION IN A BARBER'S HAND

We have recently seen a pilonidal sinus in a barber's hand.

A barber, aged 31, came to hospital with a discharging sinus on the dorsum of the interdigital cleft between the ring and little fingers of the right hand. He attributed it to a hair penetrating the skin at this point while he was cutting a customer's hair. He pulled it out, but a discharging sinus developed and persisted, and at his work other hairs tended to enter the sinus.

On examination a small nodule the size of a pea could be felt just behind the orifice of the sinus, and a probe could be passed into this nodule from the orifice of the sinus. The sinus and nodule were excised and the skin sutured. The wound healed uneventfully.

The histological picture was exactly like that of a postanal pilonidal sinus. The sinus led into a cavity lined with squamous epithelium and containing a hair follicle, and the deeper part was a track lined with granulation tissue and containing hair and debris in its walls.

The history of this case and the difficulty of any developmental explanation in this situation are strong evidence that this case is an example of pilonidal sinus due to the puncture of the skin by a hair.

Our patient said that a friend of his, also a barber, had a similar condition, which arose in the same way. So we sought for further examples. Assistants in two well-known London hairdressing firms said that it was not at all uncommon for minor infective lesions to be produced owing to puncture of the skin during haircutting, particularly in the hands. Usually they cleared without serious trouble after the removal of the hair. Occasionally, however, a more chronic lesion resulted, and we were told of one such case in which a legal action followed; but we could not trace the legal records. From our inquiries it is obvious that among barbers hair is well recognised as a traumatic and infective agent.

CONCLUSIONS

Pathology.—Critical analysis of the developmental theory of pilonidal sinus leads to the conclusion that though a small proportion of cases arise in a previously existing postanal dermoid, in the great majority of cases there is no definite evidence of such origin. Moreover, many of the features of recurrence are difficult to fit in with the developmental theory. Alternative possibilities are that pilonidal sinus is primarily an infective lesion, with secondary entrance of hair and debris, or the result of penetration of the skin by a hair, which may also introduce both infection and epithelium. We suggest that these alternative possibilities are more in accord with the facts.

Treatment.—If the developmental theory of pilonidal sinus is relegated to a subordinate place, the rational treatment of the condition demands corresponding adjustment. No longer need such emphasis be laid on the extent of the primary excision, which on the developmental theory led in many cases to a probably unnecessary removal of tissue, with consequent prejudice to the subsequent healing. Though measures short of surgical excision of the track may be successful in cases in which the lining is merely granulation tissue, excision will probably continue to be the standard treatment, because *it is impossible to tell clinically whether an epithelial* track is present or not and to remove the hairs which are acting as foreign bodies. The main emphasis in treatment becomes transferred to securing healing of a chronic infective condition at the bottom of a fold. If the causal rôle of hairs, both in the primary lesion and in recurrences, is as important as we believe, a preoperative epilation dose of X rays becomes an essential part of treatment. The results of Smith (1937), Turell (1940), and Sher (1944) offer practical encouragement to this point of view.

SUMMARY

The increased interest in pilonidal sinus as the result of the war has emphasised the dissatisfaction of surgeons with the uncertainties of its treatment, which has been reflected in a wide variety of surgical procedures.

We have therefore submitted the accepted developmental theory of pilonidal sinus to critical analysis. As a result, we conclude that, though a small proportion of cases are developmental in origin, the great majority may be acquired infective lesions, hair playing an important rôle in the production both of the primary lesion and of recurrences.

A similar lesion in a barber's hand is described.

The emphasis in treatment should be shifted from attempting a wider eradication by excision to the management of a chronic infective lesion in a fold.

A preoperative epilation dose of X rays to the area should be a routine.

REFERENCES

Barnett, L. A. (1944) *Amer. J. Surg.* **64**, 338.
British Medical Journal (1944) Any Questions ? i, 708.
Davies, L. S., Starr, K. W. (1946) *Surg. Gynec. Obstet.* **81**, 309.
Gabriel, W. B. (1945) The Principles and Practice of Rectal Surgery, London.
Goodsall, D. H., Miles, W. E. (1900) Diseases of the Anus and Rectum, London.
Kooistra, H. P. (1942) *Amer. J. Surg.* **55**, 3.
Muir, R. (1941) Textbook of Pathology, London, p. 285.
Peterson, P., Ames, R. H. (1944) *Amer. J. Surg.* **65**, 384.
Raven, R. W. (1935) *Brit. J. Surg.* **23**, 337.
Sher, J. J. (1944) *Nav. med. Bull., Wash.* **42**, 391.
Shute, F. C. jun., Smith, T. E., Levine, M., Burch, J. C. (1943) *Ann. Surg.* **118**, 706.
Smith, R. M. (1937) *Amer. J. Roentgenol.* **38**, 308.
Theis, F. V., Rusher, M. W. (1944) *Surg. Gynec. Obstet.* **79**, 482.
Turell, R. (1940) *Surgery*, **8**, 469.
Warren, J. M. (1854) *Amer. J. med. Sci.* **28**, 113.

NICOTINAMIDE METHOCHLORIDE ESTIMATIONS IN SPRUE AND AMŒBIASIS

J. W. PAULLEY
M.D. Lond., M.R.C.P.
LATE WING-COMMANDER R.A.F.V.R.

G. J. AITKEN
B.Sc., M.B. Glasg., F.R.F.P.S.
LATE SQUADRON-LEADER R.A.F.V.R.

THE published results of nicotinamide methochloride estimations in pellagra (Ellinger et al. 1945) seemed to us to justify a similar investigation in active and convalescent cases of sprue, and offered a means of assay of a vitamin-B factor related to sprue.

We intended to include in the investigation amœbiasis, bacillary dysentery, and the chronic non-specific diarrhœas to try to determine the effects, if any, of intestinal infection on nicotinamide excretion; but unfortunately we could not collect any cases of bacillary dysentery or of chronic non-specific diarrhœa.

Methods.—We used the method of Coulson et al. (1944) and Ellinger et al. (1945). For three days 24-hour urines were collected with the patients on ordinary hospital diet. For the next five days the same procedure was continued except that the patients were given 100 mg. of nicotinamide at the beginning of each 24-hour period. Each test therefore lasted eight days. To 2 controls, 2 cases of sprue, 6 of convalescent sprue, and 4 of amœbiasis the nicotinamide was given parenterally. To the remainder—7 controls, 4 cases of convalescent sprue, and 3 of amœbiasis—the vitamin was administered by

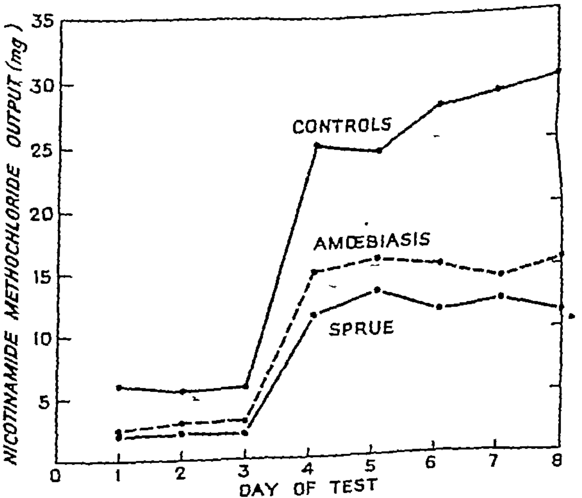


Fig 1—Average output of nicotinamide methochloride in sprue amœbiasis, and controls.

mouth. All cases of florid sprue (2) and amœbiasis (2) with looseness of the bowels received the nicotinamide parenterally to exclude the possibility of poor gut absorption.

Briefly, the method of determining the amount of nicotinamide methochloride in the urine (Coulson et al. 1944, Ellinger et al. 1945) is as follows:

> Nicotinamide methochloride is separated from urine by adsorption on 'Decalso,' from which, after washing with distilled water, it is eluted by potassium-chloride solution, then rendered alkaline, and extracted with iso-butyl alcohol. The fluorescent derivatives thus produced are compared by visual fluorimetry with standards similarly treated.

Results.—The results in controls, sprue, and amœbiasis, given in the accompanying figures (1–4), may be briefly summarised as follows:

(1) The controls produced figures of the same order as those of Ellinger et al. (1945).

(2) There was a subnormal excretion, resting and after test dosing, in patients convalescent from sprue who had had no symptoms for three months or more and had had nicotinic acid, 'Vegmite,' and liver treatment in India. Figures of excretion in this group were slightly higher than those of Ellinger et al. (1945) for pellagra.

(3) The excretion in two cases of florid sprue investigated did not differ from that in the patients convalescent from sprue.

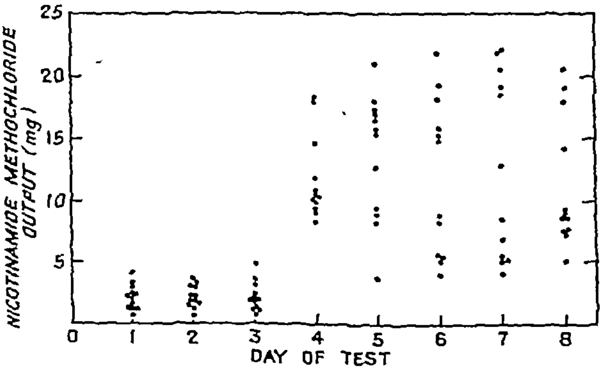


Fig. 2—Scatter diagram of nicotinamide methochloride output and saturation tests in sprue.

(4) Whether nicotinamide was given orally or parenterally to patients convalescent from sprue and to controls, the level of excretion was similar. This indicated that poor intestinal absorption of the vitamin was not a factor in cases without intestinal "hurry."

(5) Patients with amœbiasis, either with active disease or cyst passers, showed less excretion than the controls, and a slightly higher excretion than the sprue cases. Only two of these cases had diarrhœa, and both received their nicotinamide parenterally.

Comments.—The subnormal excretion in patients convalescent from sprue, who had no symptoms and had had their fill of nicotinic acid during treatment, was surprising. Not less surprising was a similar deficient excretion in cases of amœbiasis, mostly inactive from the point of view of intestinal "hurry."

It is impossible to draw any conclusions from these few results, and a larger series is required to confirm them. If, however, deficient nicotinamide-methochloride excretion in these cases can be shown to be due to subnormal intestinal biosynthesis and not to other factors (Perlzweig et al. 1943, Ellinger and Coulson 1944), our observations may be significant. We suggest tentatively that, behind this deficient nicotinamide-methochloride excretion in sprue and amœbiasis there may lie deficiencies of other

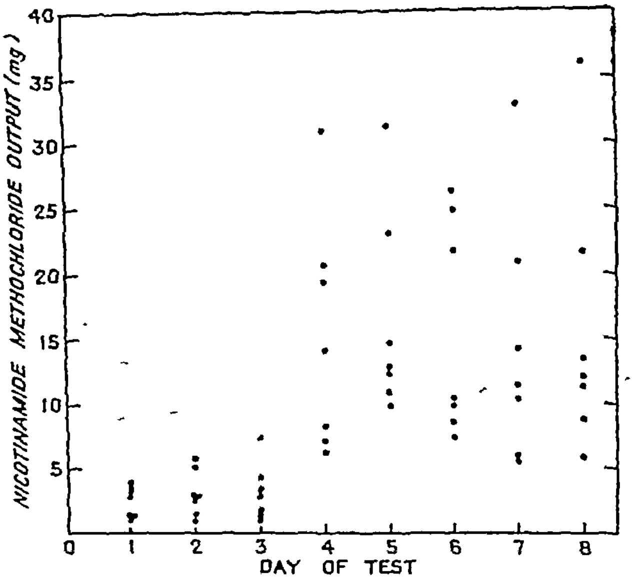


Fig. 3—Scatter diagram of nicotinamide methochloride output and saturation tests in amœbiasis.

members of the vitamin-B complex, known or unknown, whose relation to sprue may be of direct importance.

We have been obliged to leave this investigation in an incomplete state, and neither of us is likely for some time to be in a position to continue it. We feel, therefore, that these rather unexpected results should be recorded in the hope that they may be confirmed or otherwise, and possibly be of use to others continuing research in this field.

We agree with Leishman (1945) that the success of further research into this subject will depend on coördinated endeavour, an adequacy of clinical material, and laboratory facilities capable of coping with complicated and tedious analyses and assays.

We should like to thank Squadron-Leaders A. F. N. Noven, K. N. Lloyd, and J. D. Whiteside for sending us suitable cases, and Roche Products Limited for supplies of nicotinamide.

REFERENCES

Coulson, R. A., Ellinger, P., Holden, M. (1944) *Biochem. J.* 38, 150.
Ellinger, P., Benesch, R., Hardwick, S. W. (1945) *Lancet*, ii, 197.
— Coulson, R. A. (1944) *Biochem. J.* 38, 265.
Leishman, A. W. D. (1945) *Lancet*, ii, 813.
Perlzweig, W. A., Bernheim, M. L. C., Bernheim, F. (1943) *J. biol. Chem.* 150, 401.

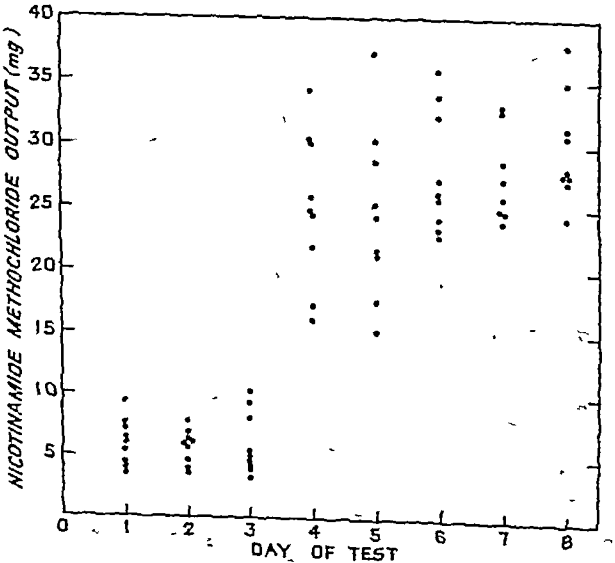


Fig. 4—Scatter diagram of nicotinamide methochloride output and saturation tests in controls.

RELATIONS OF STEROID HORMONES AND ANHYDRO-HYDROXY-PROGESTERONE TO FIBROMATOSIS

RIGOBERTO IGLESIAS, M.D.

ALEXANDER LIPSCHUTZ, M.D.

DIRECTOR OF THE DEPARTMENT OF EXPERIMENTAL MEDICINE,
NATIONAL HEALTH SERVICE, SANTIAGO DE CHILE;
PROFESSOR IN THE UNIVERSITY OF CHILE

UTERINE and other abdominal fibroids induced by œstrogens in the guineapig (Iglesias 1938, Lipschutz and Iglesias 1938, Lipschutz and Vargas 1939, Lipschutz et al. 1940) can be prevented by different steroids absorbed simultaneously with the œstrogen (Lipschutz et al. 1939, Lipschutz and Vargas, 1941a and b, Lipschutz et al. 1941, Lipschutz and Zañartu 1942, Iglesias et al. 1944), and fibroids already induced regress when an antifibromatogenic steroid is given (Lipschutz and Maas 1944, Lipschutz and Schwarz 1944).

A systematic search for antifibromatogenic steroids has shown that all the steroids capable of preventing œstrogen-induced fibroids—progesterone, desoxycorticosterone, dehydrocorticosterone, testosterone, and dihydrotestosterone—were 3-keto-steroids (Lipschutz 1944). Of these progesterone was the most active. Five other 3-keto-steroids were *not* antifibromatogenic in the quantities used: pregnanedione, allopregnanedione, Δ^{16}-dehydroprogesterone (Lipschutz et al. 1944), androstanedione, and cholestenone (Iglesias and Lipschutz 1944). On the other hand, no steroid with a hydroxyl group in position 3 was *antifibromatogenic*: androsterone, Δ^{5}-androstenediol, androstanediol (Iglesias unpublished), Δ^{5}-acetoxypregnenolone (Lipschutz et al. 1943), Δ^{5}-pregnenolone-3-acetate (Iglesias and Lipschutz, unpublished).

Our work on the antifibromatogenic activity of different steroids in relation to their chemical structure is of interest with reference also to the hormone treatment of other tumours, including cancer. Steroids have been shown to prevent many forms of œstrogen-induced atypical growth: the hyperplasia of the prostatic stroma and the metaplasia of the utriculus in macaous (Zuckerman 1936, Zuckerman and Parkes 1936, de Jongh et al. 1938), and the fibromyo-epithelioma of the prostatic region in the guineapig (Lipschutz et al. 1945). But steroids are active also against different *spontaneous* tumours in laboratory animals: the mammary adenocarcinoma of the mouse (Lacassagne 1937, Lacassagne and Raynaud 1939, Nathanson and Andervont 1939, Jones 1941, Loeser 1941, Heiman 1944, 1945), the mammary adenofibroma of the rat (Heiman 1943), a transplantable thoracic tumour in the mouse (Heilman and Kendall 1944), the leukæmia of the mouse (Murphy 1944, Gardner et al. 1944).

Steroids have been applied also in human pathology. Though success seems to be inconstant with testosterone treatment of mammary carcinoma, there may be sometimes good results (Fels 1944). Œstrogens also have been applied in similar cases (*Lancet* 1944). Fundamental progress has been achieved in the hormone treatment of prostatic cancer thanks to the work of Huggins (1943); see also Dodds (1944).

Hormones have been used also for the treatment of uterine fibroids in women (Loeser 1938, and many others). The work of Greenblatt (1943, 1944) with subcutaneously implanted testosterone-propionate pellets deserves special mention. Favourable results have been obtained also by workers associated with this department, (Vargas et al. 1945). Objections can be made against the use of testosterone because of its virilising action (Hamblen 1942), though this is only transitory (Palmer and De Ronde 1943), and because of its being active only on injection or on subcutaneous implantation of tablets and not when given by mouth.

PROGESTERONE AND ANHYDRO-HYDROXY-PROGESTERONE

Progesterone has in the guineapig a stronger antifibromatogenic action than has testosterone (Lipschutz 1942a and 1942b, 1944). But, like testosterone, progesterone is considerably less active when given by mouth than on injection; the progestational activity of progesterone given by mouth is, according to Miescher and Gasche (1943), only 1/160th of the activity of injected progesterone. Though, as shown by our previous work, progestational activity is not an absolute criterion of antifibromatogenic activity, the fact remains that progesterone which exerts the strongest progestational action also exerts the most antifibromatogenic one.

For the above-mentioned reasons an experimental study of the antifibromatogenic action of anhydro-hydroxy-progesterone (A.H.P.), or ethinyl-testosterone, has been undertaken in this laboratory. This synthetic compound is due to Ruzicka et al. (1938) and to German workers. Its biological properties have been studied by different authorities and have been described in an exhaustive study by Emmens and Parkes (1939). The androgenic activity of injected A.H.P. (in propylene glycol) was in the capon comb-growth test, according to Emmens and Parkes, only about 1/600th of the activity of injected testosterone, whereas the progestational activity of A.H.P. was in the rabbit test 1/10th of that of the injected progesterone. According to Miescher and Gasche (1943) A.H.P. (in sesame oil) has 1/5th of the activity of progesterone. But A.H.P. is equally active by mouth and by injection in producing progestational proliferation.

PREVENTION OF ŒSTROGEN-INDUCED UTERINE AND ABDOMINAL FIBROIDS IN THE GUINEAPIG BY ANHYDRO-HYDROXY-PROGESTERONE

Small tablets of α-œstradiol were implanted subcutaneously into forty-five castrated female guineapigs; 1–8 tablets of A.H.P. 5 mm. in diameter were also implanted, to obtain absorption of variable quantities of A.H.P. The quantity of α-œstradiol and of A.H.P. absorbed was calculated from the loss of weight of the dried tablet divided by the number of days. This gives only an approximate figure, as absorption per day diminishes with time (Folley 1943, Shimkin et al. 1944, Bishop and Folley 1944), and substances from outside the tablet are entering into it (Folley 1942, 1943). Absorption per day was about 0·4 µg. per sq. mm. of the tablet; this is about fifteen times less than with progesterone. Necropsies were done three months after

TABLE I—ANTIFIBROMATOGENIC ACTION OF ANHYDRO-HYDROXY-PROGESTERONE (A.H.P.) IN GUINEAPIGS

Group	α-œstradiol per day (µg)	Antifibromatogenic steroid per day (µg)	Average F.T.E. (units)*	No. of animals	Animals reaching 5·5 units†	Regional marks 2 and 3 per animal‡	F.T.E. range (units)
I	16–57	0	5·7	23	12	1·9	1–10
IIa	24–55	A.H.P. 14–25	7·1	7	5	2·6	1–11
IIb	14–64	32–85	5·3	9	6	2·0	2–8
IIc	21–84	100–191	2·5	23	3	0·5	0·5–7
IId	55–95	210–347	2·1	6	0	0·3	1–4
III	21–63	Progest. 13–24	1·4	14	0	0	1–2·5

Progest. = progesterone.

* Fibroids of four regions (uterine-subserous and parametric; of the abdominal wall; the mesosalpinx; of the mesentery and of the spleen) are classified separately and marked 0·5–1–2–3, according to size. The fibrous tumoral effect (F.T.E.) is the sum of the regional marks.

† The average of the α-œstradiol group I.

‡ See Lipschutz and Maas (1944).

implantation of the tablets. The fibromatogenic effect was classified according to the rules already published (see especially Lipschutz and Maas 1944). The results were compared with those obtained in twenty-three animals with α-œstradiol alone and with fourteen animals into which tablets of α-œstradiol and of progesterone were implanted simultaneously (group I in table II of Lipschutz et al. 1944).

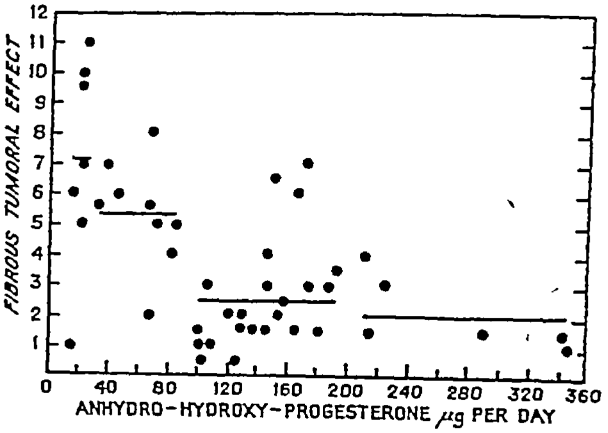
Table I (see also figure) shows that a quantity of A.H.P. (groups IIa and IIb) up to four times greater than the antifibromatogenic threshold of progesterone (group III) could not prevent œstrogen-induced fibroids. With 32–85 µg. the fibrous tumoral effect (F.T.E.) and the coefficient indicating a strong fibrous reaction (penultimate column) were as pronounced as in the absence of A.H.P. (group I). In both groups IIa and IIb no less than 50% of the animals reached the average F.T.E. of the α-œstradiol group—i.e., there was no preventive action.

Things changed considerably with quantities of 100–200 µg. of A.H.P. a day (group IIc). Though there were still three out of twenty-three animals which reached the average of the α-œstradiol group, the diminished fibrous reaction—F.T.E. = 2·5 instead of 5·3—indicates clearly that A.H.P. is antifibromatogenic. With 100–200 µg. of A.H.P. a day, or with about 5–10 times the antifibromatogenic threshold of progesterone, the "transitional zone" (Lipschutz et al. 1944) is surpassed—i.e., the antifibromatogenic action is fully evident.

TABLE II—EFFECT OF A.H.P. ON UTERINE FIBROIDS IN GUINEAPIGS

Group	No. of animals	No. of animals with uterine bleeding	No. of animals with uterine fibroids	Average fibrous uterine reaction*	Average weight of uterus (g.)	Range of weight of uterus (g.)
I	23	5	18	1·25	4·9	2·7–12·0
IIa	7	A.H.P. 0	3	0·50	4·2	2·2– 7·0
IIb	9	0	3	0·23	4·0	2·5– 6·7
IIc	23	0	3	0·15	4·0	2·2–10·0
IId	6	0	0	0	3·0	2·0– 5·7
III	14	Progest.- 0	1	0·1	3·0	1·7– 5·1

* Sum of the uterine marks of the whole group divided by number of animals in the group.



Fibrous tumoral effect induced by α-œstradiol in 45 castrated female guineapigs. Various quantities of A.H.P. a day were absorbed simultaneously. Horizontal lines indicate averages of groups IIa, IIb, IIc, and IId of table I.

A further degree of preventive antifibromatogenic action was attained in group IId with quantities of A.H.P. 10–15 times the progesterone threshold (table I).

These experiments show that A.H.P. shares with progesterone the power of preventing œstrogen-induced abdominal fibroids. But the antifibromatogenic activity of A.H.P. is less than it should be if there were full concomitance between progestational and antifibromatogenic action. With 130–240 µg. of A.H.P. a day—i.e., with ten times the antifibromatogenic threshold of progesterone—there were fibroids in many of the animals. The antifibromatogenic action of A.H.P. was even less than with testosterone (Lipschutz 1944) and especially less than would have been expected because of the side-chain of two carbons at C_{17} (Lipschutz 1944).

There is still another feature of antifibromatogenic action which deserves special mention: the preventive antifibromatogenic action refers in the first place to the subserous *uterine* fibroids and to the parametric ones. In groups IIa and IIb (table II), in which the quantities of A.H.P. were still insufficient to inhibit the abdominal fibrous reaction, there was already a very pronounced diminution of subserous uterine fibroids. In groups IIc and IId uterine fibroids were absent or almost absent. The frequency of animals with a uterine fibrous reaction was with 100–191 µg. of A.H.P. a day scarcely more pronounced than in group III with small quantities of progesterone. Table II gives a comprehensive picture of the remarkable fact that the preventive action is preferably and primarily against the uterine tumours and only secondarily against the abdominal fibroids in general. This statement is of special interest so far as practical application of our results is concerned.

The differential behaviour of uterine and extra-uterine fibroids has been found with all antifibromatogenic steroids used in our work; it can be simply explained by the higher fibromatogenic threshold for uterine fibroids compared with that for extra-uterine ones. In these quantitative circumstances uterine fibroids certainly must be the first to be *prevented*. In experiments with the progesterone treatment of previously induced fibroids the differential *regression* of uterine and extra-uterine fibroids was indeed less pronounced (Lipschutz and Maas 1944).

OTHER ANTI-ŒSTROGENIC ACTIONS OF ANHYDRO-HYDROXY-PROGESTERONE

The antifibromatogenic action coincides with other anti-œstrogenic ones. The last two columns of table II show that the increase of uterine weight due to the œstrogen is in group IId partly counteracted by A.H.P. The thickening of the myometrium was less. Though polypous growth was still present it was much less than with œstradiol alone. It was the same with reference to the vascularisation of the submucosa. Consequently there was no œstrogen-induced uterine bleeding when A.H.P. was absorbed simultaneously. As shown in table II, 5 out of 23 animals with œstradiol alone bled from the uterus; there should have been uterine bleeding in about 10 out of 45 animals in group II. But bleeding was absent even in those experiments where A.H.P. was absorbed in quantities which were smaller than those necessary to prevent abdominal fibroids.

There was no masculinising action on the clitoris, which in the guineapig is very sensitive to androgens (Lipschutz 1919, 1924, Ruz 1939). The masculinising action was absent even in group IId with 210–347 µg. of A.H.P. a day, whereas with similar quantities of testosterone propionate the transformation of the clitoris into a hypospadic penis-like organ begins to be seen in 4–7 days (Ruz 1939). With A.H.P. nothing similar happened even in so long a period as three months. Our results corroborate fully the statement of Emmens and Parkes (1939) about the very small androgenic potency of A.H.P.

PROSPECTS OF CLINICAL TRIALS WITH ANHYDRO-HYDROXY-PROGESTERONE

Clinical trials with A.H.P. in cases of uterine fibroids can be recommended on the basis of our experiments.

The facts that A.H.P., unlike progesterone, is active by mouth and that there is not the slightest danger of virilisation as with testosterone give greater hopes for the successful treatment of fibroids with A.H.P. than with the two natural steroids mentioned. It is true that findings concerning the action of steroids in laboratory animals cannot be directly applied to women. According to some authorities œstrogens may play a part in the genesis of uterine fibroids in women (Hamblen 1945). But, on the other hand, we must emphasise that up till now we have been unable to induce fibroids with œstrogens in the new-world monkey (Iglesias and Lipschutz 1940), even when these animals were kept for almost three *years* in the same experimental fibromatogenic conditions under which fibroids were induced in guinea-pigs in three *months*.

Since androgens have been revealed to be so active against uterine bleeding and against fibroids, one may tentatively suggest combining in clinical trials maximal quantities of A.H.P. by mouth with the injection of small quantities of testosterone propionate or with the subcutaneous implantation of tablets sufficiently small to allow for an absorption of only non-virilising quantities of the androgen.

SUMMARY

The antifibromatogenic action of steroids and their antitumoral action in general is discussed.

Anhydro-hydroxy-progesterone (A.H.P.), a synthetic steroid active by mouth, was tested for its power to prevent œstrogen-induced fibroids in the guineapig.

A.H.P., whose progestational activity is about a tenth of that of progesterone, has been shown to be also antifibromatogenic. But the quantities of A.H.P. necessary to prevent abdominal fibroids are about fifteen times greater than the antifibromatogenic dose of progesterone, though the antifibromatogenic effect is evident with smaller quantities of A.H.P.

Uterine fibroids are more readily prevented than other abdominal fibroids.

Œstrogen-induced uterine bleeding was counteracted with quantities of A.H.P. much smaller than those necessary for obtaining an antifibromatogenic effect.

The prospects of clinical trials with A.H.P. are discussed.

ADDENDUM

On the strength of our laboratory results with different steroids and especially with progesterone in the treatment of experimental fibroids, A. L. Goodman (*J. clin. Endocrin.* 1946, **6**, 402) has tried the therapeutic possibilities of progesterone against uterine fibromyoma in women. In seven cases 10 mg. of progesterone was injected 3–6 times weekly. A decrease in the size of the tumour or of the uterus is reported in all cases; the decrease is notable as early as 1–3 weeks after beginning the treatment. In less than 2 months the decrease was to $^1/_4$–$^3/_4$ of the original size. In one case the tumour mass "appeared to be completely gone."

This investigation has been aided by grants from the Jane Coffin Childs Memorial Fund for Medical Research, the Rockefeller Foundation, and the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation. Acknowledgment is made by A. Lipschutz for the Charles L. Mayer Award, 1944, of The National Science Fund of the National Academy of Sciences of the U.S. Our thanks are due to Dr. E. Oppenheimer, of Ciba Pharmaceutical Products, Summit N.J., for a generous gift of steroids.

REFERENCES

Bishop, P. M. F., Folley, S. J. (1944) *Lancet*, i, 434.
de Jongh, S. E., Kok, D. J., van der Woerd, L. A. (1938) *Arch. internat. Pharmacodyn.* **58**, 310.
Dodds, E. C. (1944) Vitamins and Hormones, New York, vol. II, p. 353.
Emmens, C. W., Parkes, A. S. (1939) *J. Endocrinol.* **1**, 332.
Fels, E. (1944) *Ibid*, **4**, 121.
Folley, S. J. (1942) *Nature, Lond.* **150**, 403, 735.
— (1943) *Ibid*, **152**, 134.
Gardner, W. U., Dougherty, T. F., Williams, W. L. (1944) *Cancer Res.* **4**, 73.

Continued at foot of next column

References continued

Greenblatt, R. B. (1943) *J. Amer. med. Ass.* **121**, 17.
— (1944) Office Endocrinology, Springfield, chap. 9.
Hamblen, E. C. (1942) *J. clin. Endocrin.* **2**, 575.
— (1945) Endocrinology of Woman, Springfield, p. 520.
Heilman, F. R., Kendall, E. C. (1944) *Endocrinology*, **34**, 416.
Heiman, J. (1943) *Cancer Res.* **3**, 65.
— (1944) *Ibid*, **4**, 31.
— (1945) *Ibid*, **5**, 426.
Huggins, C. (1943) *Science*, **97**, 541.
Iglesias, R. (1938) Tesis, Universidad de Chile (Public. Med. Exp. no. 1).
— — (unpublished).
— Lipschutz, A. (1944) *Proc. Soc. exp. Biol., N.Y.* **55**, 41.
— — (unpublished).
— — Nieto, G. (1944) *Cancer Res.* **4**, 510.
Jones, E. E. (1941) *Ibid*, **1**, 787.
Lacassagne, A. (1937) *C.R. Soc. Biol. Paris*, **126**, 385.
— Raynaud, A. (1939) *Ibid*, **130**, 680; **131**, 586.
Lancet (1944) ii, 20.
Lipschutz, A. (1919) Die Pubertätsdrüse und ihre Wirkungen, Berne.
— (1924) The Internal Secretions of the Sex Glands, Cambridge.
— (1942a) *J. Amer. med. Ass.* **120**, 171.
— (1942b) *Cold Spr. Harb. Symp. quant. Biol.* **10**, 79.
— (1944) *Nature, Lond.* **153**, 260.
— Bruzzone, S., Fuenzalida, F. (1943) *Proc. Soc. exp. Biol., N.Y.* **54**, 303.
— — — (1944) *Cancer Res.* **4**, 179.
— Iglesias, R. (1938) *C.R. Soc. Biol. Paris*, **129**, 519.
— — Vargas, L. jun. (1940) *Proc. Soc. exp. Biol., N.Y.* **45**, 788.
— Maas, M. (1944) *Cancer Res.* **4**, 18.
— Murillo, R., Vargas, L. jun. (1939) *Lancet*, ii, 420.
— Schwarz, J. (1944) *Cancer Res.* **4**, 24.
— Vargas, L. jun. (1939) *Lancet*, i, 1313.
— — (1941a) *Endocrinology*, **28**, 669.
— — (1941b) *Lancet*, i, 568.
— — Nuñez, C. (1941) *Proc. Soc. exp. Biol., N.Y.* **48**, 271.
— Yanine, D., Schwarz, J., Bruzzone, S., Acuña, L., Silberman, S. (1945) *Cancer Res.* **5**, 515.
— Zañartu, J. (1942) *Endocrinology*, **31**, 192.
Loeser, A. A. (1938) *Lancet*, i, 373.
— (1941) *Ibid*, ii, 698.
Miescher, K., Gasche, P. (1943) *Helv. physiol. Acta*, **1**, 287.
Murphy, J. B. (1944) *Cancer Res.* **4**, 622.
Nathanson, I. T., Andervont, H. B. (1939) *Proc. Soc. exp. Biol., N.Y.* **40**, 421.
Palmer, H. D., De Rondo, M. (1943) *J. clin. Endocrin.* **3**, 428.
Ruz, O. (1939) Tesis Universidad de Chile (Public Med. Exp. no. 3).
Ruzicka, L., Hofmann, K., Meldahl, H. F. (1938) *Helv. chim. Acta*, **21**, 372.
Shimkin, M. B., Lorenz, E., Wyman, R., Norton, S. G. (1944) *Endocrinology*, **35**, 283.
Vargas, L., Vargas, R., Ossandon, M. (1945) *Rev. méd. Chile*, **73**, 443.
Zuckerman, S. (1936) *Lancet*, ii, 1259.
— Parkes, A. S. (1936) *Ibid*, i, 242.

REMEDIAL CORRECTION OF VALGUS FOOT STRAIN BY FOOT PRONATION EXERCISE

E. T. BAILEY
M.B. Lond., F.R.C.S.
SURGEON, FRACTURE "A" DEPARTMENT

B. S. HARRENS
SENIOR PHYSICAL TRAINING INSTRUCTOR

NORTHERN HOSPITAL, WINCHMORE HILL

THE normal foot has been aptly compared to a tripod balanced evenly beneath the leg, with the os calcis in line with the astragalus and tibia. The maintenance of this balance depends on the ability of the foot to bring the head of the first metatarsal to the ground by adequate foot pronation. Should this pronation be deficient, the first metatarsal can only be brought down by a tilting of the whole foot outwards at the subastragaloid joint. This at once produces the characteristic appearance of "flat-foot," with valgus deviation of the foot as a whole and of the os calcis in particular. In such a position of imbalance it is not surprising that symptoms of foot and leg strain appear with rapid fatigue of muscles working at a mechanical disadvantage.

Restoration of normal foot balance with adequate foot pronation should therefore be the aim of treatment; and, though corrective osteotomy of the first metatarsal may be necessary in certain cases of congenital abnormality, it was felt by us that remedial treatment specifically directed to foot pronation could bring about the desired result. With this object in view, one of us (B. S. H.) has designed the foot corrector apparatus illustrated which ensures maintenance of the correct position of the os calcis during pronation exercises in a manner which is not possible with orthodox routine foot exercises.

The apparatus (fig. 1) consists of a T-shaped wooden

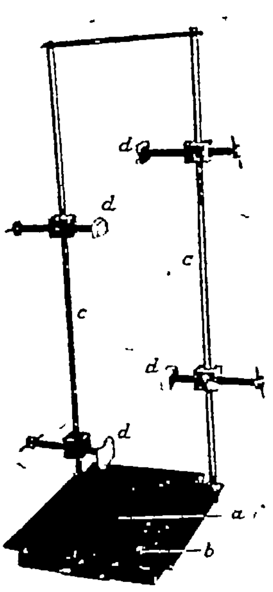


Fig. 1—The Harrens foot corrector: (a) T-piece with roller; (b) wooden base; (c) vertical rods; (d) metal plates.

foot-piece with the stem in the form of a roller (*a*) mounted upon a wooden base (*b*), from the sides of which arise two vertical adjustable metal rods (*c*). A top cross-bar unites the rods, each of which carries two sliding padded metal plates (*d*) for application to the heel and leg. Fig. 2 shows a patient seated with the leg vertical and the outer border of the foot resting on the T-piece. Four padded plates are in position, one on each side of the heel, one on the inner aspect of the leg, and one on the outer side of the thigh immediately above the knee. Movement can take place now only in the forefoot, which is actively pronated by the patient until the head of the first metatarsal can be brought down over the roller to touch the wooden base, as shown in fig. 3, which illustrates the degree of pronation present in the normal foot.

The use of two plates is not essential to maintain the position of the os calcis, which can in most cases be effectively controlled by a single plate on the outer side of the heel, provided the leg plate is applied well down the inner side of the leg about 2–4 in. above the ankle.

The apparatus has now been in constant use for eighteen months and has been found capable of correcting pronation deficiency of up to 30° in about three weeks. The pronation exercise is combined with other recognised foot exercises and physiotherapy, and is supplemented in most instances by wedging of the inner side of the heels of the boots or shoes.

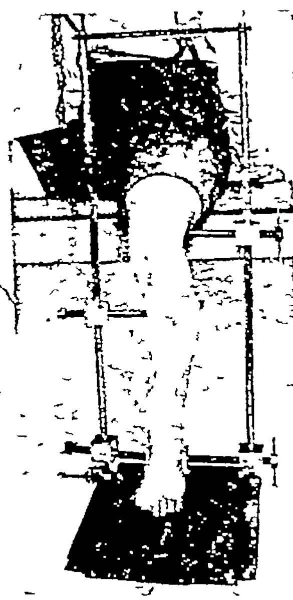


Fig. 2—Plates holding foot and leg in correct position, outer border of foot resting on roller.

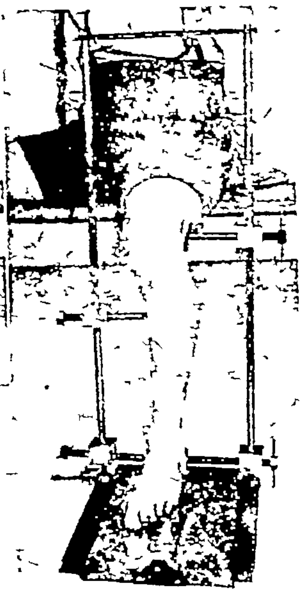


Fig. 3—Foot pronated.

The types of case for which the foot corrector has proved of value are: (1) simple valgus strains and early flat-foot in children and adults; (2) foot re-education after immobilisation in plaster; and (3) fractured os calcis.

Pronation deficiency following immobilisation in plaster can be minimised by taking care to avoid inversion of the foot and to see that the foot is pronated in the plaster as much as is practicable. The os calcis group of cases have proved more satisfactory than was expected and have in most cases been prevented from developing the all too common painful strain below the external malleolus.

We are indebted to the London County Council for the illustrations and for the supply of the foot corrector, which has been manufactured for us by Messrs. Masters & Sons, 240, New Kent Road, London, S.E.1, from whom it is obtainable.

Preliminary Communication

"PELLAGRAGENIC" ACTIVITY OF INDOLE-3-ACETIC ACID IN THE RAT

Krehl and co-workers[1] have shown that rats fed on a low-protein, low-tryptophane diet, containing 40% of maize, stop growing. Normal growth was restored by the addition of nicotinic acid or tryptophane to this diet. Woolley[2] found that 3-acetyl-pyridine produced in mice and rats a depression of growth which could be counteracted by either nicotinic acid or tryptophane. In search for a similar antivitamin in maize he has recently obtained a potent extract which was "pellagragenic" to mice in amounts of 1 mg. per 100 g. of diet.

We have been investigating the reasons why maize produces such a deficiency in rats, having particular regard to possible defects in the metabolism of tryptophane. Now, maize is known to be a rich source of indole-3-acetic acid (heteroauxin). Yellow maize meal contains, according to Haagen-Smit et al.,[3] 20 mg. per kg., or, according to Berger and Avery,[4] 100 mg. of indole-3-acetic acid per kg.; it is present largely in the form of a precursor which can be converted into indole-3-acetic acid by mild alkaline or enzymic digestion. For a diet containing 40% of maize meal the above figures correspond with 0·8 mg. and 4·0 mg. of indole-3-acetic acid per 100 g. of diet respectively.

In our experiments young rats of 60 g. weight all gained weight steadily on a purified diet containing 10·5% casein as the sole source of protein, and administration of nicotinic acid or tryptophane did not increase the growth-rate significantly. However, of 32 rats fed on a similar diet supplemented with 1·5 mg. of indole-3-acetic acid per 100 g. of diet, 19 rats showed a severe depression of growth. Of these 19 rats, 9 were dosed either with 1 mg. of nicotinic acid or with 20 mg. of tryptophane per day: this treatment in all cases effected a cure, while the remaining 10 rats which were left undosed as controls did not recover (see table).

The effect of indole-3-acetic acid was similar to that produced by the addition of whole maize meal (40%) to the diet. Of 33 rats fed on the maize-meal diet, 29 showed a severe depression of growth which could always be cured either by nicotinic acid or tryptophane. On a high-protein diet (20% casein) neither maize meal nor indole-3 acetic acid was effective in stopping growth.

---

1. Krehl, W. A., Sarma, P. S., Teply, L. J., Elvehjem, C. A. *J. Nutrit.* 1946, 31, 85; Krehl, W. A., Teply, L. J., Elvehjem, C. A. *Science*, 1945, 101, 283; Krehl, W. A., Teply, L. J., Sarma, P. S., Elvehjem, C. A. *Ibid*, p. 489.
2. Woolley, D. W. *J. biol. Chem.* 1945, 157, 455; 1946, 162, 179; 1946, 163, 773.
3. Haagen Smit, A. J., Leech, W. D., Bergren, W. R. *Amer. J. Botany*, 1942, 29, 500.
4. Berger, J., Avery, G. S. jun. *Ibid*, 1944, 31, 199.

EFFECTS OF TREATMENT *

Diet	No. of rats	Average weekly gain in weight *before* treatment (g.)	Treatment	Average weekly gain in weight *after* treatment (g.)
10 5 % casein	4	15	—	—
	4	—	Nicotinic acid, preventive	18
	4	—	Tryptophane, preventive	16
10·5 % casein + indole-3-acetic acid	10	5	—	—
	7	3	Nicotinic acid, curative	11
	2	0	Tryptophane, curative	19
7 % casein + 40 % maize	22	4	—	—
	4	2	Nicotinic acid, curative	25
	3	2	Tryptophane, curative	13

* Basal diet: 3 % cotton-seed oil, 5 % salt mixture, 0 15 % cystine, casein as shown above, and sucrose ad 100. In diets containing yellow maize meal, the oil, salts, and cystine content were reduced by 40 %. The protein content of all the diets was about 10·5 %. Vitamin supplements as described by Black et al.,[5] omitting nicotinic acid.

Further experiments are in progress to determine *whether the "pellagragenic" effect of maize can be* attributed entirely to its high "auxin" content, relative to its low tryptophane and nicotinic-acid content.

E. KODICEK
Ph.D. Camb., M.D. Prague.
K. J. CARPENTER
B.A. Camb.
LESLIE J. HARRIS
Sc.D. Camb., D.Sc. Manc., F.R.I.C.

Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council.

Reviews of Books

Actions of Radiations on Living Cells

D. E. LEA, M.A., PH.D., Prophit student of the Royal College of Surgeons, formerly fellow of Trinity College, Cambridge. London: Cambridge University Press. Pp. 402. 21*s.*

THE greater part of this good book is occupied by an account of the effects of radiations (mostly X and *gamma) on viruses and on the genes and chromosomes* of higher cells; this happens to be the field where Dr. Lea's own experimental and theoretical work has taken him and for which he is widely known. Exactly how *cellular death is brought about by X and gamma rays* is not yet known, but he discusses the question in detail, especially the so-called target theory, defined as follows:

> "When the biological effect observed is due to the production of ionization in some particular molecules, as in the induction of gene mutations, or is due to the passage of an ionizing particle through some particular structure, *as in the induction of chromosome breakage*, it is possible to calculate the size of the molecule or structure involved from a knowledge of the proportion of the organisms irradiated which are affected by a given dose or radiation. It is further *possible to predict the variation of ionic* efficiency of different radiations in producing effects of this sort. The interpretation of biological effects of radiation along these lines has become known as the *target theory*."

It is perhaps not unfair to say of this theory that while it does help towards explaining the way in which differing ionic efficiencies are linked with different radiations, it *leaves many phenomena quite unexplained.*

Many readers will welcome the full account of genetic effects and the chromosome structural changes set up by radiation. There is much discussion at present among radiologists as to whether the *mutations set up in* drosophila have any practical bearing on man. Is there any considerable chance that radiologists in the course of their work (which, however carefully carried out, does involve some degree of exposure) suffer *mutational* changes? Unfortunately nearly all of the mutations seen in drosophila appear to be regressive. With radiation work extending on all sides it is inevitable that this subject will be widely discussed in all its bearings. *Cosmic radiation, it seems, is insufficient in intensity to* account for the spontaneous mutations known to occur without apparent cause; we must look elsewhere.

Throughout the book the outlook is *quantitative.* It will appeal to a growing body of people who see radiation not only as benign but sometimes as deadly. Though Dr. Lea does not mention it, his text makes it clear that protective methods will have *to be elaborated to* cope with the growing use of this agent.

L'anémie infectieuse.

G. HEMMELER, privat-dozent, University of Lausanne. Basle: Schwabe. Pp. 76. Sw. fr. 5.

THIS monograph is an attempt to amplify the scanty sections in most textbooks on the subject of anæmia in *infectious disease.* Details are given of anæmia occurring in typhoid fever, bacterial endocarditis, rheumatoid arthritis, and other conditions. Complete records are given of 25 selected patients; besides full blood-counts, sternal marrow punctures were carried out, the reticulocyte changes followed, and estimations made of the serum iron. Dr. Hemmeler notes that the severity of the anæmia is directly proportional to the severity of the fever, the acceleration of the blood-sedimentation rate, and the leucocytosis. The anæmia is normochromic and reticulocytes are low. The bone-marrow is less cellular than normal and the erythroblasts are mainly basophilic, few oxyphilic. The serum iron is normal or low. When the infection dies down there is a spontaneous remission of the anæmia, independent of treatment, accompanied by a small reticulocytosis and increased cellularity of the bone-marrow with accelerated erythroblast maturation. Dr. Hemmeler thinks that the anæmia *arises from the failure of a depressed* erythropoietic marrow to make up the loss of red cells due to the increased rate of hæmolysis that accompanies fevers. He finds no evidence that it is due to iron-deficiency, and attributes it to toxic depression of erythropoiesis. He makes the useful point that iron and liver are useless for treating these patients; blood-transfusion should be undertaken whenever the hæmoglobin falls below 60%.

A good deal of valuable information is presented in this pamphlet; but, as in other Swiss writings at present, there is little evidence of contact with Anglo-American *literature since 1939, and no reference to the* work on the disturbance of hæmoglobin formation in infectious diseases.

The Outlook of Science

Modern Materialism. (2nd ed.) R. L. WORRALL, M.B. Sydney. London: Staples Press. Pp. 191. 12*s.* 6*d.*

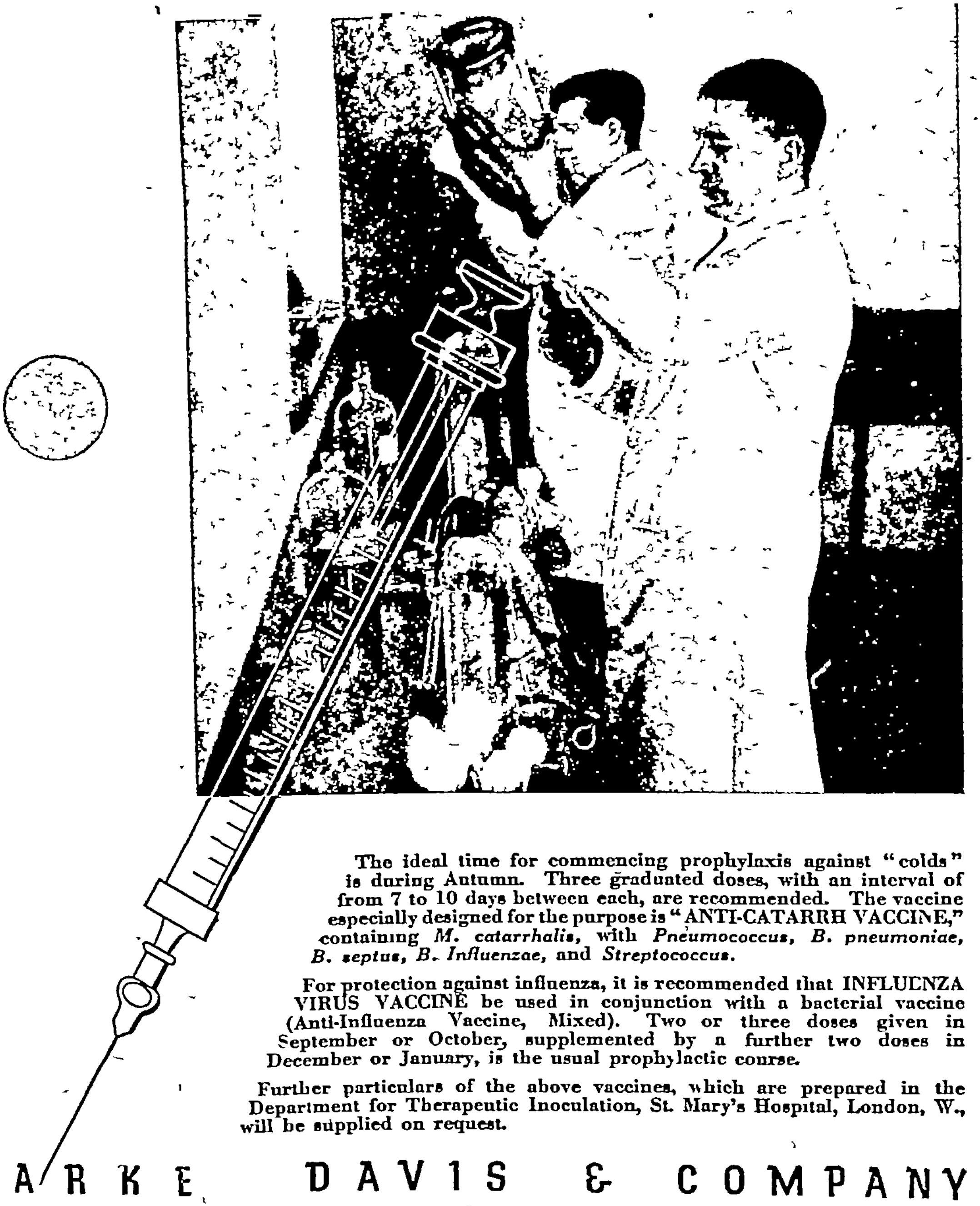
THOUGH useful, this book is not in the front rank with Maudsley's *Organic to Human* and Bosanquet's *Meditatio Medici* (neither of which appears in the bibliography appended to this work). The author's vision is fairly clear, but he wears glasses *which are misty* in spots. As a champion of dialectic materialism he looks forward to a time when, under a world government *based on* genuine democracy (undefined), science will satisfy the essential wants of all; and having demolished Bishop Berkeley, Bertrand Russell, Sir Oliver Lodge, Eddington, J. S. Haldane, Sir James Jeans, Lancelot Hogben, and A. N. Whitehead, he takes his stand on Lenin, Marx, Engels, and Freud. Besides science, he discusses philosophy, *religion*, and art. Religion, he says, is founded on idealism, the opposite of materialism; therefore religion is an illusion. Religion is a social product and "exists today because of its value to the ruling classes of capitalist society. . . . Science and art can be considered together, in being fertile forms of human culture. Religion, however, an inevitable phase of early culture, has become sterile, and is now equally inevitably a reactionary force inimical to the welfare of *society.*" *He advocates* a "revolutionary transformation" of society (and points to the U.S.S.R.), without which the successful future of science is impossible. The present subservience of science to politics is *illustrated, he believes,* by the atom bomb. Few will want to follow him all the way but he has his stimulating moments.

Messrs. *H. K. Lewis, Gower Street,* London, *W.C.1,* are the English agents for the Year Book of Neurology, Psychiatry and Endocrinology which was reviewed in our issue of Sept. 21.

---

5. Black, S., Overman, R. S., Elvehjem, C. A., Link, K. P. *J. biol. Chem.* 1942, **145**, 137.

ST. MARY'S HOSPITAL
VACCINES
FOR RESPIRATORY AFFECTIONS



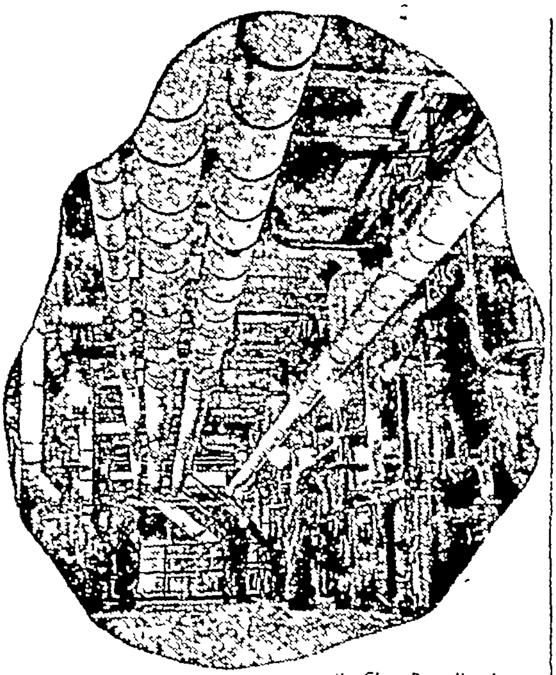
The ideal time for commencing prophylaxis against "colds" is during Autumn. Three graduated doses, with an interval of from 7 to 10 days between each, are recommended. The vaccine especially designed for the purpose is "ANTI-CATARRH VACCINE," containing *M. catarrhalis*, with *Pneumococcus*, *B. pneumoniae*, *B. septus*, *B. Influenzae*, and *Streptococcus*.

For protection against influenza, it is recommended that INFLUENZA VIRUS VACCINE be used in conjunction with a bacterial vaccine (Anti-Influenza Vaccine, Mixed). Two or three doses given in September or October, supplemented by a further two doses in December or January, is the usual prophylactic course.

Further particulars of the above vaccines, which are prepared in the Department for Therapeutic Inoculation, St. Mary's Hospital, London, W., will be supplied on request.

PARKE DAVIS & COMPANY

50, *Beak St., London, W.1* *Inc. U.S.A., Liability Ltd.* ● SOLE AGENTS



At the Glaxo Penicillin plant, Barnard Castle Co Durham.

Manufacturers of
PENICILLIN

PENICILLIN *Glaxo*

From the beginning Glaxo Laboratories Ltd. have played the leading part both in the development and manufacture of penicillin The normal daily output of the Glaxo penicillin plant is exceptionally pure; a potency of 1,400 units per mg. is routinely attained. Storage in a cool DRY place is all that is necessary.

Some GLAXO products

ACRAMINE
ADEXOLIN
ANETHAINE OINTMENT
ANETHAINE SPINAL
BERIN
CALDEFERRUM
CELIN AND INFANT CELIN
COLLOIDAL CALCIUM WITH OSTELIN
DIENOESTROL *Glaxo*
ERBOLIN
ETHAMOLIN
EXAMEN
FAREX
FERROLAC
FERSOLATE
GLUCODIN
KAPILON
MALTO-DEXTRIN *Glaxo*
MERSAGEL
MINADEX
NICORBIN
HIGH POTENCY OSTELIN
OSTERMILK
OSTOCALCIUM
OSTOMALT
PELONIN
PELONIN AMIDE
PENICILLIN *Glaxo*
PERMIDIN
PHENIODOL *Glaxo*
PHYSOLACTIN
PLEXAN
PREPALIN
PYELECTAN
PYELOSIL
SOLUBLE PROTEIN *Glaxo*
VACCINES
VITEOLIN

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

A non-greasy ANALGESIC OINTMENT

PRODUCT OF THE GLAXO LABORATORIES

Relief of pain and discomfort within a few minutes and lasting two hours or more is obtained after the simple, direct application of 'Anethaine' Ointment to the skin or mucous membrane.

'Anethaine' Ointment is non-greasy and is readily removed with water from the skin or clothing. It contains 1.0 per cent. of the fat-soluble base of amethocaine hydrochloride.

For the relief of pain in haemorrhoids and skin diseases generally. Many other uses will suggest themselves to doctors.

ANETHAINE
Ointment
Available in ½ oz. TUBES

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

THE LANCET

LONDON: SATURDAY, OCT. 5, 1946

Over to the Lords

TAKEN by and large, Mr. BEVAN's handling of the National Health Service Bill in the House of Commons was masterly, and many of those who a few months ago were strongly antagonistic now understand the strength of the Government case. There are grounds therefore for his hope that, though the armies are still arrayed on the battlefield, they are becoming increasingly listless; and the president of one of the Royal Colleges did well last week to direct attention to the peace conferences which must soon follow. Nevertheless a further chance remains for amending the text of the Bill, during the debate which opens in the House of Lords next Tuesday, and it would be a pity if this discussion were to be a mere formality. Much in the scheme remains highly debatable, and the Government should welcome any attempt to make a good Bill better—to correct weaknesses that might eventually prove its undoing. Uneasiness over several of its provisions is still felt by those most anxious for its success.

Despite all the Minister's explanations, we are still uncertain whether the degree of autonomy granted to hospital management committees is going to be sufficient, in the long run, to induce able men and women to serve them devotedly. The misgivings felt on this score were cogently set out in our columns a few weeks ago [1] by a correspondent who rightly pointed out that on the management committee "more than on any other body or person—the Minister included—will depend whether a hospital functions in an efficient and humane manner." Decentralisation of powers, as Mr. BEVAN recognises, is the main safeguard against a uniformly second-rate service, and he has accepted the plea made in our first comment on the Bill [2] that hospital management committees should at least have their own pocket-money and be able to accept gifts. He has in fact promised that the regulations will ensure that adequate powers are delegated by the regional boards to the committees. But if that is his intention, is it necessary that the Bill should specifically lay down that the regional boards shall be the bodies to appoint officers, to maintain premises, and "to acquire on behalf of the Minister and to maintain equipment, furniture and other movable property required for the purposes of any such hospital"? Are the boards really going to appoint subordinate personnel, to paint the building, and to mend broken tables and chairs? In general Mr. BEVAN has sought to leave himself and his successors a free hand, so that where experience reveals a mistake it will be possible to modify the Bill by regulation, without new legislation. Can he be sure that the statutory assignment of these powers to regional boards—which, especially if there are only 16–20 large regions,[3] are capable of becoming pieces of bureaucratic machinery [4]—will not need modification? Some hold that in practice it will seriously limit the devolution of responsibility which all desire. If the policy is to delegate to local management committees whatever powers may be found necessary for their functional health, would it not be wise at this stage to omit these particularising subsections? To some extent the scheme is admittedly experimental, and it might be best to say quite simply that the regional boards and the hospital management committees shall exercise such powers as are respectively delegated to them by the Minister. Though nebulous, this would at any rate not be misleading.

Another possible source of future trouble is the wide power of direction given to the Minister in connexion with hospital and specialist services. As we have already remarked,[5] this power is not restricted to the administrative as distinct from the professional sphere. When Mr. BEVAN was challenged on the point in the standing committee he gave an assurance that he would not be so foolish as to meddle in professional matters; and this assurance, since repeated, undoubtedly represents his attitude correctly. Yet the profession, with its experience of directions of a semitechnical character that have issued from the Emergency Medical Service, cannot be so easily satisfied. There will be—there ought to be—medical officers in the Ministry of Health anxious to secure widespread adoption of modern techniques. Will their ideas emanate from Whitehall with all the authority of directions made in the name of the Minister, binding even on the regional boards? That is the question, and Mr. BEVAN did not really answer it. We hope therefore it is not too late to incorporate in the Bill a formula making it clear how far the Minister's power of direction legitimately extends. This should not be beyond the wit of legal draftsmen, for the distinction between administrative and professional matters is neither new nor hopelessly subtle: it is commonly respected in the hospital world today. The fact surely is that the simple wording of the Bill as it stands is too simple to meet the complexity of the undertaking. For simplicity's sake the distinction between the administrative and professional responsibility in respect of the hospital and specialist services has been allowed to slip into the background. It would be a pity indeed if it were to become blurred, for the ultimate consequences could be disastrous to professional freedom.

A related question, calling for legal debate, is whether practitioners whose conduct the Minister finds harmful to the National Health Service should have a right to appeal from his decision to a court of law. The procedure as now laid down is that any complaint is made to the local executive council and is examined in the first place by a purely medical body, the council's medical subcommittee. A decision on the complaint is then reached by the council, half of whose members are doctors, dentists, and pharmacists. If the defendant practitioner is dissatisfied with the council's verdict he can appeal to a tribunal of three persons, of whom the chairman is appointed by the Lord Chancellor. If again unsuccessful he can appeal to the Minister himself, who is the person finally responsible for the well-being of the service. But only if one of these authorities appears to have

---

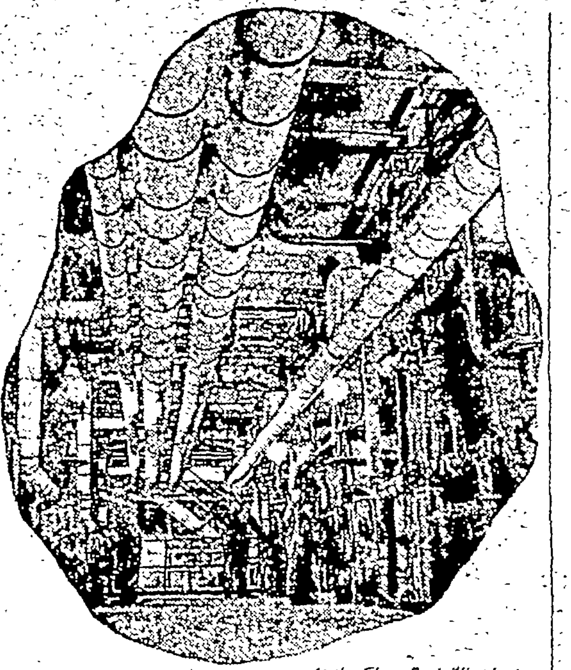
[1] *Lancet*, July 20, p. 103.

[2] *Ibid*, 1946, i, 421.

[3] *Times*, July 12, p. 5.

[4] *Lancet*, July 27, p. 137.

[5] *Ibid*, 1946, i, 783.



At the Glaxo Penicillin plant, Barnard Castle, Co. Durham.

Manufacturers of
PENICILLIN

PENICILLIN *Glaxo*

From the beginning Glaxo Laboratories Ltd. have played the leading part both in the development and manufacture of penicillin. The normal daily output of the Glaxo penicillin plant is exceptionally pure; a potency of 1,400 units per mg. is routinely attained. Storage in a cool DRY place is all that is necessary.

Some GLAXO products

ACRAMINE
ADEXOLIN
ANETHAINE OINTMENT
ANETHAINE SPINAL
BERIN
CALDEFERRUM
CELIN AND *INFANT CELIN*
COLLOIDAL CALCIUM WITH OSTELIN
DIENOESTROL *Glaxo*
ERBOLIN
ETHAMOLIN
EXAMEN
FAREX
FERROLAC
FERSOLATE
GLUCODIN
KAPILON
MALTO-DEXTRIN Glaxo
MERSAGEL
MINADEX
NICORBIN
HIGH POTENCY OSTELIN
OSTERMILK
OSTOCALCIUM
OSTOMALT
PELONIN
PELONIN AMIDE
PENICILLIN *Glaxo*
PERMIDIN
PHENIODOL *Glaxo*
PHYSOLACTIN
PLEXAN
PREPALIN
PYELECTAN
PYELOSIL
SOLUBLE PROTEIN *Glaxo*
VACCINES
VITEOLIN

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

A non-greasy ANALGESIC OINTMENT

PRODUCT OF THE Glaxo LABORATORIES

Relief of pain and discomfort within a few minutes and lasting two hours or more is obtained after the simple, direct application of 'Anethaine' Ointment to the skin or mucous membrane.

'Anethaine' Ointment is non-greasy and is readily removed with water from the skin or clothing. It contains 1.0 per cent. of the fat-soluble base of amethocaine hydrochloride.

For the relief of pain in haemorrhoids and skin diseases generally. Many other uses will suggest themselves to doctors.

ANETHAINE

Ointment

Available in ½ oz. TUBES

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

anæsthesia have been tried. Hamilton Bailey[6] advocates a local anæsthetic plus 'Pentothal sodium,' and his advice is followed by many resident surgical officers; this method has the advantage that a long anæsthesia is not maintained for what is really a short operation. Recently curare has proved useful in these cases. As Mimpriss and Etheridge[7] remark, the incidence of chest complications is largely determined by the state of the peritoneal cavity after operation. We know that the peritoneal cavity is usually sterile for about twelve hours after a perforation. The time of the previous meal, the presence of chunks of food, beer, and particularly the barium of an opaque meal—all these are factors influencing the prognosis which must be carefully weighed before deciding against operative treatment. Not enough has yet been heard of the use of penicillin in peritonitis to enable its value to be judged. If we are inclined to give credit to the sulphonamides for the very satisfactory Newcastle figures we must not forget that Gilmour and Saint's series was published in the days before sulphonamide therapy. Taylor's patients had neither sulphonamides nor penicillin. We know that the streptococcus is the usual infecting organism, and penicillin systemically administered does penetrate into the peritoneal cavity. This is a large cavity, so large doses of penicillin may be required. Crile[8] has recently pointed out that in generalised peritonitis of appendicular origin, where there is a mixed infection, extremely large doses of penicillin are necessary; he has advocated 100,000 units every two hours for four to six days. Generalised peritonitis following perforation is an almost certainly fatal complication, and there is need for more work on this subject. Taylor has pointed to one way of preventing this disaster—turn the tap off, put the stomach-tube down, and give the peritoneum a reasonable chance of exercising its natural function of limiting infection.

Pilonidal Sinus

During the war pilonidal sinus proved, for so small and undignified a lesion, a remarkable waster of man-power. Thus, according to Holman,[1] it cost the United States Navy 359,209 "sick days" in the two years 1942 and 1943. A peripatetic correspondent recalls that so striking was the tendency for riding in hard-seated vehicles to exacerbate the pilonidal sinus that it came to be familiarly called the "jeep disease." At first sight the treatment of a small discharging sinus or an apparent boil posterior to the anus seems a simple problem; but it is one which, from delayed healing or recurrence, has baffled the ingenuity of many surgeons.

The pilonidal sinus, or postanal dermoid, has hitherto been accepted as an infected embryological remnant. Two main theories of origin have been held—one that the sinus arises from imperfect separation of the hind end of the neural tube from the ectoderm, and the other that it is a sequestration dermoid formed during fusion of the ectoderm growing in towards the midline. There is proof that both these mechanisms do sometimes give rise to dermoids in this region, but Mr. Patey and Professor Scarff, elsewhere in this issue, challenge the view that all, or even most, pilonidal sinuses are of embryological origin. They have been struck by the number of excised specimens in which no epithelial lining can be detected, and by the rarity of sebaceous glands and even of hair follicles. They have found little difference in the histology of a primary and a recurrent sinus, and they think that most examples are acquired infective lesions, probably originating from puncture of the skin by a hair. This belief was strengthened by their encountering a pilonidal sinus in the hand of a barber and finding that puncture of the skin by hairs is by no means an uncommon cause of minor sepsis of the hand in barbers. The idea of a hair causing a puncture wound must be novel to many, but it seems to offer a reasonable explanation of pilonidal sinuses. Any puncture in an area so heavily infected, so humid, and so constantly subjected to friction and movement as the natal cleft, would tend not to heal.

Conflicting theories of ætiology seldom have an immediate practical impact on patients. What is distressing about pilonidal sinus is the extreme divergence of views on the best method of treatment, because it indicates that no method is really satisfactory. Every kind of operation has been tried, from mere evacuation of pus to wide ablation of the sinus and its surroundings. Most surgeons excise en bloc and suture the resulting wound, but some excise and leave healing to occur by granulation—a process tedious to both patient and doctor. Even among those who excise and suture, there is no unanimity on technique, as we may see from two recent papers from America, both reporting series of at least 100 cases. Larsen[2] believes in wide excision of skin, no undercutting of skin edges, and approximation of fat and skin only, with as many layers of cotton sutures as can conveniently be inserted. Larkin,[3] on the other hand, advises sparing excision of the skin and wide undermining of the flaps, and he approximates the wound edges with a single layer of wire sutures which pierce skin, fat, and sacrococcygeal fascia. Larkin secures hæmostasis by catgut ligatures, Larsen uses cotton, while Holman stops bleeding by pressure, because he holds that the small tags of dead tissue caused by clamping and tying vessels are prejudicial to healing.

It seems as if results must depend, as in so many surgical procedures, on the man rather than the method. One can however state in general terms the present trends in the treatment of pilonidal sinus. First, radical operation should be deferred if the sinus is in a state of acute inflammation. When the latter has subsided the whole sinus must be excised so that the body starts its healing processes with an aseptic wound; and to achieve this it is not necessary to sacrifice much skin. The wound edges should usually be sutured, because healing by granulation takes a long time and often leaves a scar whose skin is ill adapted to sustain the chafe and pressure inherent in its position. Every effort must be made to prevent secondary infection: hæmostasis should be carefully secured with as few and as fine ligatures as possible, the dead space must be obliterated (for which purpose each surgeon must select

exceeded its legal powers, or to have acted improperly, can he seek help from an outside court. Provided the morale of the profession and the service is high, these arrangements should work well in practice; and Mr. BEVAN has substance for his contention that the High Court is not the right kind of body to say whether a doctor has been reasonably efficient. Nevertheless under the new régime expulsion from the public service will be an extremely serious penalty, and it seems contrary to the principles of justice that sentence should be passed by the Minister who may be indirectly responsible for the accusation It was to overcome this objection, of course, that the tribunal was inserted between the local executive council and the Minister; but two of the three members of this tribunal are to be chosen by the Minister himself. The arrangements are in fact of the "quasi-judicial" nature which Sir HENRY SLESSER[6] and other eminent lawyers view with alarm, and there is far more in question than administrative convenience.

---

[6] Bailey, H. Emergency Surgery, Bristol, 1945.
[7] Mimpriss, T. W., Etheridge, F. G. *Brit. med. J.* 1944, ii, 466.
[8] Crile, G. *Surg. Gynec. Obstet.* 1946, 83, 150.

[1] Holman, E. *Surg. Gynec. Obstet.* 1946, 83, 94.
[2] Larsen, B. B. *Ann. Surg.* 1946, 123, 1091.
[3] Larkin, L. C. *Surg. Gynec. Obstet.* 1946, 82, 694.

All these are matters that the Lords are well fitted to elucidate. It is their function to take a long view, and we trust that discussion will not be frozen by too ready acquiescence, on either side of the House, in the Bill as it stands.

Perforated Peptic Ulcer

"THIS is one of the most serious and overwhelming catastrophes that can befall a human being. Unless surgical measures are adopted early, the disease hastens to a fatal ending in almost every instance." In the decades since MOYNIHAN spoke these words, early operation for the perforated peptic ulcer has seemed to be as right and natural as the surgeon's gloves. So it comes as a shock to find HERMON TAYLOR, in the article we published last week, declaring that conservatism has a place—he would even give it pride of place—in the treatment of perforation. He puts forward a convincing series of 28 cases treated by conservative methods with 4 deaths; 3 from conditions unrelated to the treatment, and only 1 in which, as he admits, operation might have made a difference. TAYLOR has turned away from immediate laparotomy, first, because he often found at operation that the perforation was already partially sealed and nature was clearly capable of completing the process. The peritoneal cavity, it appeared, could cope with a considerable quantity of infective fluid, provided that continued gross flooding from the perforation site was controlled by aspirating the stomach. Secondly, he had found that the mortality with operation was high, largely because of chest complications. Thirdly, many of these patients, because of bronchitis, severe hypertension, or myocardial failure, came in the "poor risk" class, where even a minor surgical procedure was hazardous.

These results must be studied in conjunction with those of operation. TAYLOR's cases were mostly early perforations, the delay before admission to hospital exceeding six hours in only 3—a fact that speaks well for the diagnostic alertness of the general practitioners in the district. Is operation really hazardous in such early cases? GILMOUR and SAINT[1] record 51 cases operated on within twelve hours of perforation with 1 death; SOUTHAM[2] 34 cases of duodenal perforation operated on within twenty-four hours with no deaths. MAINGOT[3] gives the mortality as 2–6%. Unfortunately it is the practice to group together all perforations, and the overall mortality figures for surgical treatment thus seem high. Even so HOUSTON,[4] in a recent analysis, gives the Newcastle figures for 1943 as 184 cases with 8·2% mortality; for 1944 as 190 cases with a 6·3% mortality Surgery has not a great deal to be ashamed of with such figures.

These comparisons in no way detract from the value of the information to be drawn from TAYLOR's experience. It emphasises the need for emptying the stomach as soon as possible after the perforation has been diagnosed; the small Ryle tube is not enough and it is a useful tip to give an amethocaine lozenge to facilitate the passage of a large tube. Morphine should be given as soon as possible and the patient "made comfortable." TAYLOR *neither advocates nor condemns* the Fowler position, and one may assume that the half-sitting position is the most comfortable one; it is noteworthy that none of his cases developed a subphrenic abscess. His results have shown that where the diagnosis is in doubt, or where the patient's poor general condition or the lack of a surgeon prohibits operation, we have a method of treating the early case with a reasonable chance of success. TAYLOR agrees that when there has been a recent large meal with a likelihood of extensive spilling into the peritoneal cavity, and when the patient comes "too late," surgery is indicated. It must not be forgotten that the perforation is usually an emergency, coming under the care of the house-surgeon or R.S.O., whereas conservative treatment obviously requires an experienced clinical eye; it might therefore be hazardous to advocate this treatment as the routine, even for the early case. Most surgeons, too, will find operation less nerve-racking than a policy of wait and see. One surgeon with a considerable experience of conservative treatment has remarked: "I agree conservative treatment works, but I have given it up. I have had too much anxiety with the early convalescence of these cases." The conservative method suggests itself as particularly suitable for the aged. TANNER,[5] in a series of 16 perforations in people over sixty, had 10 deaths after operation—apparently a formidable mortality. Of 8 cases operated on under twelve hours, however, 6 made a complete recovery, and the 2 deaths were due to bronchopneumonia and cerebral thrombosis; in TANNER's view failure to send the patient to the surgeon early was mainly responsible for the high mortality, and in TAYLOR's 6 cases in men over sixty the only death was in a patient who had perforated twenty-four hours before admission.

The operation for perforation is usually simplicity itself. A midline incision seems to be most popular, though a right rectus muscle incision is used by some surgeons because there is an 8 to 1 chance of the perforation being duodenal. In view of the chest complications which commonly follow the perforated ulcer, and the difficulty of attaining adequate relaxation of the abdominal wall, various methods of anæsthesia have been tried. Hamilton Bailey[6] advocates a local anæsthetic plus 'Pentothal sodium,' and his advice is followed by many resident surgical officers; this method has the advantage that a long anæsthesia is not maintained for what is really a short operation. Recently curare has proved useful in these cases. As Mimpriss and Etheridge[7] remark, the incidence of chest complications is largely determined by the state of the peritoneal cavity after operation. We know that the peritoneal cavity is usually sterile for about twelve hours after a perforation. The time of the previous meal, the presence of chunks of food, beer, and particularly the barium of an opaque meal—all these are factors influencing the prognosis which must be carefully weighed before deciding against operative treatment. Not enough has yet been heard of the use of penicillin in peritonitis to enable its value to be judged. If we are inclined to give credit to the sulphonamides for the very satisfactory Newcastle figures we must not forget that Gilmour and Saint's series was published in the days before sulphonamide therapy. Taylor's patients had neither sulphonamides nor penicillin. We know that the streptococcus is the usual infecting organism, and penicillin systemically administered does penetrate into the peritoneal cavity. This is a large cavity, so large doses of penicillin may be required. Crile[8] has recently pointed out that in generalised peritonitis of appendicular origin, where there is a mixed infection, extremely large doses of penicillin are necessary; he has advocated 100,000 units every two hours for four to six days. Generalised peritonitis following perforation is an almost certainly fatal complication, and there is need for more work on this subject. Taylor has pointed to one way of preventing this disaster—turn the tap off, put the stomach-tube down, and give the peritoneum a reasonable chance of exercising its natural function of limiting infection.

---

[6] *Times*, August 9, p. 5.

[1] Gilmour, J., Saint, J. A. *Brit. J. Surg.* 1932, 20, 78.

[2] Southam, A. H. *Brit. med. J.* 1932, i, 556.

[3] Maingot, R. H. Abdominal Operations. London, 1940.

[4] Houston, W. *Brit. med. J.* 1946, ii, 221.

[5] Tanner, N. C. *Ibid*, 191[illegible]

Pilonidal Sinus

During the war pilonidal sinus proved, for so small and undignified a lesion, a remarkable waster of man-power. Thus, according to Holman,[1] it cost the United States Navy 359,209 "sick days" in the two years 1942 and 1943. A peripatetic correspondent recalls that so striking was the tendency for riding in hard-seated vehicles to exacerbate the pilonidal sinus that it came to be familiarly called the "jeep disease." At first sight the treatment of a small discharging sinus or an apparent boil posterior to the anus seems a simple problem; but it is one which, from delayed healing or recurrence, has baffled the ingenuity of many surgeons.

The pilonidal sinus, or postanal dermoid, has hitherto been accepted as an infected embryological remnant. Two main theories of origin have been held—one that the sinus arises from imperfect separation of the hind end of the neural tube from the ectoderm, and the other that it is a sequestration dermoid formed during fusion of the ectoderm growing in towards the midline. There is proof that both these mechanisms do sometimes give rise to dermoids in this region, but Mr. Patey and Professor Scarff, elsewhere in this issue, challenge the view that all, or even most, pilonidal sinuses are of embryological origin. They have been struck by the number of excised specimens in which no epithelial lining can be detected, and by the rarity of sebaceous glands and even of hair follicles. They have found little difference in the histology of a primary and a recurrent sinus, and they think that most examples are acquired infective lesions, probably originating from puncture of the skin by a hair. This belief was strengthened by their encountering a pilonidal sinus in the hand of a barber and finding that puncture of the skin by hairs is by no means an uncommon cause of minor sepsis of the hand in barbers. The idea of a hair causing a puncture wound must be novel to many, but it seems to offer a reasonable explanation of pilonidal sinuses. Any puncture in an area so heavily infected, so humid, and so constantly subjected to friction and movement as the natal cleft, would tend not to heal.

Conflicting theories of ætiology seldom have an immediate practical impact on patients. What is distressing about pilonidal sinus is the extreme divergence of views on the best method of treatment, because it indicates that no method is really satisfactory. Every kind of operation has been tried, from mere evacuation of pus to wide ablation of the sinus and its surroundings. Most surgeons excise en bloc and suture the resulting wound, but some excise and leave healing to occur by granulation—a process tedious to both patient and doctor. Even among those who excise and suture, there is no unanimity on technique, as we may see from two recent papers from America, both reporting series of at least 100 cases. Larsen[2] believes in wide excision of skin, no undercutting of skin edges, and approximation of fat and skin only, with as many layers of cotton sutures as can conveniently be inserted. Larkin,[3] on the other hand, advises sparing excision of the skin and wide undermining of the flaps, and he approximates the wound edges with a single layer of wire sutures which pierce skin, fat, and sacrococcygeal fascia. Larkin secures hæmostasis by catgut ligatures, Larsen uses cotton, while Holman stops bleeding by pressure, because he holds that the small tags of dead tissue caused by clamping and tying vessels are prejudicial to healing.

It seems as if results must depend, as in so many surgical procedures, on the man rather than the method. One can however state in general terms the present trends in the treatment of pilonidal sinus. First, radical operation should be deferred if the sinus is in a state of acute inflammation. When the latter has subsided the whole sinus must be excised so that the body starts its healing processes with an aseptic wound; and to achieve this it is not necessary to sacrifice much skin. The wound edges should usually be sutured, because healing by granulation takes a long time and often leaves a scar whose skin is ill adapted to sustain the chafe and pressure inherent in its position. Every effort must be made to prevent secondary infection: hæmostasis should be carefully secured with as few and as fine ligatures as possible, the dead space must be obliterated (for which purpose each surgeon must select

exceeded its legal powers, or to have acted improperly, can he seek help from an outside court. Provided the morale of the profession and the service is high, these arrangements should work well in practice; and Mr. BEVAN has substance for his contention that the High Court is not the right kind of body to say whether a doctor has been reasonably efficient. Nevertheless under the new régime expulsion from the public service will be an extremely serious penalty, and it seems contrary to the principles of justice that sentence should be passed by the Minister who may be indirectly responsible for the accusation. It was to overcome this objection, of course, that the tribunal was inserted between the local executive council and the Minister; but two of the three members of this tribunal are to be chosen by the Minister himself. The arrangements are in fact of the "quasi-judicial" nature which Sir HENRY SLESSER[6] and other eminent lawyers view with alarm, and there is far more in question than administrative convenience.

---

[6] Bailey, H. Emergency Surgery, Bristol, 1943.

[7] Mimpriss, T. W., Etheridge, F. G. *Brit. med. J.* 1944, ii, 466.

[8] Crile, G. *Surg. Gynec. Obstet.* 1946, 83, 150.

[1] Holman, E. *Surg. Gynec. Obstet.* 1946, 83, 94.

[2] Larsen, B. B. *Ann. Surg.* 1946, 123, 1090.

[3] Larkin, L. C. *Surg. Gynec. Obstet.* 1946, 82, 694.

All these are matters that the Lords are well fitted to elucidate. It is their function to take a long view, and we trust that discussion will not be frozen by too ready-acquiescence, on either side of the House, in the Bill as it stands.

Perforated Peptic Ulcer

"THIS is one of the most serious and overwhelming catastrophes that can befall a human being. Unless surgical measures are adopted early, the disease hastens to a fatal ending in almost every instance." In the decades since MOYNIHAN spoke these words, early operation for the perforated peptic ulcer has seemed to be as right and natural as the surgeon's gloves. So it comes as a shock to find HERMON TAYLOR, in the article we published last week, declaring that conservatism has a place—he would even give it pride of place—in the treatment of perforation. He puts forward a convincing series of 28 cases treated by conservative methods with 4 deaths; 3 from conditions unrelated to the treatment, and only 1 in which, as he admits, operation might have made a difference. TAYLOR has turned away from immediate laparotomy, first, because he often found at operation that the perforation was already partially sealed and nature was clearly capable of completing the process. The peritoneal cavity, it appeared, could cope with a considerable quantity of infective fluid, provided that continued gross flooding from the perforation site was controlled by aspirating the stomach. Secondly, he had found that the mortality with operation was high, largely because of chest complications. Thirdly, many of these patients, because of bronchitis, severe hypertension, or myocardial failure, came in the "poor risk" class, where even a minor surgical procedure was hazardous.

These results must be studied in conjunction with those of operation. TAYLOR's cases were mostly early perforations, the delay before admission to hospital exceeding six hours in only 3—a fact that speaks well for the diagnostic alertness of the general practitioners in the district. Is operation really hazardous in such early cases? GILMOUR and SAINT[1] record 51 cases operated on within twelve hours of perforation with 1 death; SOUTHAM[2] 34 cases of duodenal perforation operated on within twenty-four hours with no deaths. MAINGOT[3] gives the mortality as 2–6%. Unfortunately it is the practice to group together all perforations, and the overall mortality figures for surgical treatment thus seem high. Even so, HOUSTON,[4] in a recent analysis, gives the Newcastle figures for 1943 as 184 cases with 8·2% mortality; for 1944 as 190 cases with a 6·3% mortality. *Surgery has not a great deal to be ashamed of with such figures.*

These comparisons in no way detract from the value of the information to be drawn from TAYLOR's experience. It emphasises the need for emptying the stomach as soon as possible after the perforation has been diagnosed; the small Ryle tube is not enough, and it is a useful tip to give an amethocaine lozenge to facilitate the passage of a large tube. Morphine should be given as soon as possible and the patient "made comfortable." TAYLOR neither advocates nor condemns the Fowler position, and one may assume that the half-sitting position is the most comfortable one; it is noteworthy that none of his cases developed a subphrenic abscess. His results have shown that where the diagnosis is in doubt, or where the patient's poor general condition or the lack of a surgeon prohibits operation, we have a method of treating the early case with a reasonable chance of success. TAYLOR agrees that when there has been a recent large meal with a likelihood of extensive spilling into the peritoneal cavity, and when the patient comes "too late," surgery is indicated. It must not be forgotten that the perforation is usually an emergency, coming under the care of the house-surgeon or R.S.O., whereas conservative treatment obviously requires an experienced clinical eye; it might therefore be hazardous to advocate this treatment as the routine, even for the early case. Most surgeons, too, will find operation less nerve-racking than a policy of wait and see. One surgeon with a considerable experience of conservative treatment has remarked: "I agree conservative treatment works, but I have given it up. I have had too much anxiety with the early convalescence of these cases." The conservative method suggests itself as particularly suitable for the aged. TANNER,[5] in a series of 16 perforations in people over sixty, had 10 deaths after operation—apparently a formidable mortality. Of 8 cases operated on under twelve hours, however, 6 made a complete recovery, and the 2 deaths were due to bronchopneumonia and cerebral thrombosis; in TANNER's view failure to send the patient to the surgeon early was mainly responsible for the high mortality, and in TAYLOR's 6 cases in men over sixty the only death was in a patient who had perforated twenty-four hours before admission.

The operation for perforation is usually simplicity itself. A midline incision seems to be most popular though a right rectus muscle incision is used by some surgeons because there is an 8 to 1 chance of the perforation being duodenal. In view of the chest complications which commonly follow the perforated ulcer, and the difficulty of attaining adequate relaxation of the abdominal wall, various methods of anæsthesia have been tried. Hamilton Bailey[6] advocates a local anæsthetic plus 'Pentothal sodium,' and his advice is followed by many resident surgical officers; this method has the advantage that a long anæsthesia is not maintained for what is really a short operation. Recently curare has proved useful in these cases. As Mimpriss and Etheridge[7] remark, the incidence of chest complications is largely determined by the state of the peritoneal cavity after operation. We know that the peritoneal cavity is usually sterile for about twelve hours after a perforation. The time of the previous meal, the presence of chunks of food, beer, and particularly the barium of an opaque meal—all these are factors influencing the prognosis which must be carefully weighed before deciding against operative treatment. Not enough has yet been heard of the use of penicillin in peritonitis to enable its value to be judged. If we are inclined to give credit to the sulphonamides for the very satisfactory Newcastle figures we must not forget that Gilmour and Saint's series was published in the days before sulphonamide therapy. Taylor's patients had neither sulphonamides nor penicillin. We know that the streptococcus is the usual infecting organism, and penicillin systemically administered does penetrate into the peritoneal cavity. This is a large cavity, so large doses of penicillin may be required. Crile[8] has recently pointed out that in generalised peritonitis of appendicular origin, where there is a mixed infection, extremely large doses of penicillin are necessary: he has advocated 100,000 units every two hours for four to six days. Generalised peritonitis following perforation is an almost certainly fatal complication, and there is need for more work on this subject. Taylor has pointed to one way of preventing this disaster—turn the tap off, put the stomach-tube down, and give the peritoneum a reasonable chance of exercising its natural function of limiting infection.

---

[6] *Times*, August 9, p. 5.

[1] Gilmour, J., Saint, J. A. *Brit. J. Surg.* 1932, 20, 78.

[2] Southam, A. H. *Brit. med. J.* 1932, i, 556.

[3] Maingot, R. H. Abdominal Operations, London, 1940.

[4] Houston, W. *Brit. med. J.* 1946, ii, 221.

[5] Tanner, N. C. *Ibid*, 1943, i, 563.

Pilonidal Sinus

During the war pilonidal sinus proved, for so small and undignified a lesion, a remarkable waster of man-power. Thus, according to Holman,[1] it cost the United States Navy 359,209 "sick days" in the two years 1942 and 1943. A peripatetic correspondent recalls that so striking was the tendency for riding in hard-seated vehicles to exacerbate the pilonidal sinus that it came to be familiarly called the "jeep disease." At first sight the treatment of a small discharging sinus or an apparent boil posterior to the anus seems a simple problem; but it is one which, from delayed healing or recurrence, has baffled the ingenuity of many surgeons.

The pilonidal sinus, or postanal dermoid, has hitherto been accepted as an infected embryological remnant. Two main theories of origin have been held—one that the sinus arises from imperfect separation of the hind end of the neural tube from the ectoderm, and the other that it is a sequestration dermoid formed during fusion of the ectoderm growing in towards the midline. There is proof that both these mechanisms do sometimes give rise to dermoids in this region, but Mr. Patey and Professor Scarff, elsewhere in this issue, challenge the view that all, or even most, pilonidal sinuses are of embryological origin. They have been struck by the number of excised specimens in which no epithelial lining can be detected, and by the rarity of sebaceous glands and even of hair follicles. They have found little difference in the histology of a primary and a recurrent sinus, and they think that most examples are acquired infective lesions, probably originating from puncture of the skin by a hair. This belief was strengthened by their encountering a pilonidal sinus in the hand of a barber and finding that puncture of the skin by hairs is by no means an uncommon cause of minor sepsis of the hand in barbers. The idea of a hair causing a puncture wound must be novel to many, but it seems to offer a reasonable explanation of pilonidal sinuses. Any puncture in an area so heavily infected, so humid, and so constantly subjected to friction and movement as the natal cleft, would tend not to heal.

Conflicting theories of ætiology seldom have an immediate practical impact on patients. What is distressing about pilonidal sinus is the extreme divergence of views on the best method of treatment, because it indicates that no method is really satisfactory. Every kind of operation has been tried, from mere evacuation of pus to wide ablation of the sinus and its surroundings. Most surgeons excise en bloc and suture the resulting wound, but some excise and leave healing to occur by granulation—a process tedious to both patient and doctor. Even among those who excise and suture, there is no unanimity on technique, as we may see from two recent papers from America, both reporting series of at least 100 cases. Larsen[2] believes in wide excision of skin, no undercutting of skin edges, and approximation of fat and skin only, with as many layers of cotton sutures as can conveniently be inserted. Larkin,[3] on the other hand, advises sparing excision of the skin and wide undermining of the flaps, and he approximates the wound edges with a single layer of wire sutures which pierce skin, fat, and sacrococcygeal fascia. Larkin secures hæmostasis by catgut ligatures, Larsen uses cotton, while Holman stops bleeding by pressure, because he holds that the small tags of dead tissue caused by clamping and tying vessels are prejudicial to healing.

It seems as if results must depend, as in so many surgical procedures, on the man rather than the method. One can however state in general terms the present trends in the treatment of pilonidal sinus. First, radical operation should be deferred if the sinus is in a state of acute inflammation. When the latter has subsided the whole sinus must be excised so that the body starts its healing processes with an aseptic wound; and to achieve this it is not necessary to sacrifice much skin. The wound edges should usually be sutured, because healing by granulation takes a long time and often leaves a scar whose skin is ill adapted to sustain the chafe and pressure inherent in its position. Every effort must be made to prevent secondary infection: hæmostasis should be carefully secured with as few and as fine ligatures as possible, the dead space must be obliterated (for which purpose each surgeon must select

for himself from a bewildering number of suture and dressing techniques the method he thinks will best avoid "tenting" of the skin), and the surface of the wound must be kept dry. Though penicillin can usefully be employed, local implantation of the sulphonamides, particularly the less soluble ones like sulphathiazole, is liable to increase exudation and thus do more harm than good. Finally, PATEY and SCARFF, following the implications of their hypothesis, suggest that preoperative epilation of the area by X rays is likely to prove an essential part of the treatment.

---

[6] Bailey, H. Emergency Surgery, Bristol, 1945.
[7] Mimpriss, T. W., Etheridge, F. G. *Brit. med. J.* 1944, ii, 466.
[8] Crile, G. *Surg. Gynec. Obstet.* 1946, 83, 150.

[1] Holman, E. *Surg. Gynec. Obstet.* 1946, 83, 94.
[2] Larsen, B. B. *Ann. Surg.* 1946, 123, 1091.
[3] Larkin, L. C. *Surg. Gynec. Obstet.* 1946, 82, 694.

Annotations

WORLD MEDICAL ASSOCIATION

IF the World Medical Association, whose formation in London last week is reported elsewhere in this issue, is to fulfil the aims that are set before it, it will need world support. Its first purpose must therefore be to attract into full membership those countries which were not represented at the meeting or which, like the United States of America, were represented only by observers. Its second purpose may well be to become a live body, sharing actively in world health organisation. Last week the sentiment seemed to be against the association's concerning itself with scientific medicine, because, according to one delegate, each country has its own academies competent for this work. On the other hand, the resolution setting out the association's functions allowed for the exchange of information between the different countries. It might be best if this clause were liberally interpreted; for, as we have lately suggested (Sept. 7, p. 352), the complexity of modern medicine calls for the closest technical understanding between all countries. The association, if it shouldered the task of promoting the exchange of scientific information, and particularly information on research, might benefit not only world medicine but the professions in the constituent countries.

CARDIOVASCULAR CHANGES IN ANÆMIA

DESPITE the fundamental relation of anæmia to the cardiovascular system, published work has been mainly concerned with particular aspects of the question, or with rare or severe disorders. In 1939 Ellis and Faulkner[1] reviewed the effects of anæmia on the hearts of 47 patients, but these were of all ages, and, as the investigators themselves pointed out, degenerative cardiovascular changes in the elderly undoubtedly vitiated the results. In this country Alastair Hunter[2] has now made a similar study of 34 patients, excluding all those in whom factors other than anæmia were likely to influence the cardiovascular findings.

Dyspnœa, palpitation, and cardiac pain were noted in that order of frequency, all three symptoms being related to exercise and relieved by rest. Dyspnœa was never orthopnœic or paroxysmal. Anginal pain occurred in 8 patients, but only 2 had radiation to the arm or back, while 4 others had tightness of the chest. Hunter is sure that anæmia alone can cause cardiac pain, and he suggests that "in any woman under forty, without hypertension, and complaining of cardiac pain, the cause may be an unrecognised anæmia." Hypertensives were excluded; the average initial blood-pressure was 135 mm. Hg systolic, and 70 mm. Hg diastolic. Treatment was followed by a rise in both the systolic and, more especially, the diastolic pressures; in 3 patients the rise was considerable, amounting in 2 ultimately to hypertension. In 8 patients a third heart sound, classified as abnormal under Evans's recent scheme,[3] was heard. Systolic murmurs were present in 30 of the 34 patients; 9 had apical murmurs only, 20 had pulmonary, or pulmonary and aortic, and 1 had a pulmonary only. Of these, 2 had additional murmurs, early diastolic and presystolic respectively, which disappeared with treatment. Only 4 had no murmurs. No correlation could be demonstrated between murmurs and cardiac enlargement. Murmurs, although disappearing after treatment, did not do so with anything like the rapidity of the enlargement. Heart-size, which was assessed radiologically, was definitely increased in 12, and equivocally so in 6; size regressed with treatment in 11, improvement being maximal in the early weeks. There was no direct relation between enlargement and the severity of the anæmia, although the duration of the latter seemed a possible factor. Of 25 patients who had an electrocardiogram, 5 showed minor changes, 2 of these being gross; 2 of the 5 reverted to normal after treatment.

These are interesting findings, for the signs and symptoms described here have often in the past led to an erroneous diagnosis of heart-failure. The dyspnœa, palpitation, œdema, cardiac pain, and murmurs may all result directly from different qualitative changes in the blood. Cardiac enlargement, Hunter considers, is caused by a dynamic disorder of the circulation, although, with excessive physical demands or pre-existing cryptic cardiac disease, true failure may supervene. Sharpey-Schafer[4] has suggested that in severe chronic anæmia the raised venous pressure, which is a traditional sign of failure, may in reality represent the final phase in an undefined process of circulatory adjustment, directed towards maintaining the high cardiac output necessary for the adequate functioning of the defective blood. Hunter concludes that "enlargement of the heart in anæmia, accompanied as it sometimes is by a raised venous pressure, addition of the third heart sound, and inversion of the T-wave in the right pectoral electrocardiogram, is an expression of right heart preponderance which may progress to frank heart-failure with hepatic engorgement and œdema." Here is a fascinating field for investigation. The cause of the raised venous pressure requires elucidation, and the accurate methods of assessing venous pressure and cardiac output by cardiac catheterisation, which led to Sharpey-Schafer's observations, are likely to be used sooner or later in the investigation of uncomplicated anæmias in younger patients.

PALPABLE PEDAL PULSATIONS

THE study of the normal, which has been rapidly advanced by the mass medical examinations of the late war, has provided useful data that will be of value in the early recognition of disease. The latest addition to our knowledge is the finding that of 1014 healthy American soldiers, whose average age was 20 years and of whom over 90% were under 22, there were over 13% in whom the pulsation of the dorsalis pedis or posterior tibial artery was impalpable.[1] The dorsalis pedis pulsation was absent on the right in 11·4% and on the left in 13·6%. The posterior tibial pulsation was absent on the right in 2·9% and on the left in 2·7%. In only 5 men was pulsation absent in both arteries on the same side, but in 7·5% the dorsalis pedis pulsation was absent in both feet, while in 1·7% the posterior tibial pulsation was absent in both feet.

A curious incidental observation was that the posterior tibial pulsation was more commonly absent in the Negro, while the dorsalis pedis pulsation was more often absent in the white soldier. It was confirmed that when pulsaion was absent in one artery, the other artery in the same foot had an enhanced pulsation. This observation was first recorded in 1898, by Erb[2]; but pulsation was absent in only 3 of his 381 patients. Morrison[3] found that 19% of the 1000 people he investigated had absent pulsations; but most of his subjects were women, and there was a wide variation of ages. If 13 of every 1000 healthy young men have impalpable dorsalis pedis or posterior tibial pulsations, there is clearly need for caution in drawing conclusions from the absence of such pulsations in patients with suspected peripheral vascular disease.

---

[1] Ellis, L. B., Faulkner, J. M. *New Engl. J. Med.* 1939, 220, 943.
[2] Hunter, A. *Quart. J. Med.* 1946, 15, 107.
[3] Evans, W. *Brit. Heart J.* 1943, 5, 205.
[4] Sharpey-Schafer, E. P. *Clin. Sci.* 1944, 5, 125.

[1] Silverman, J. J. *Amer. Heart J.* 1946, 32, 82.

INTENSIVE COURSE IN PSYCHOTHERAPY

AN interesting experiment on the teaching of psychotherapy to general practitioners is reported by Mr. Geddes Smith for the Commonwealth Fund.[1] A fortnight's course for 25 doctors was held at the University of Minnesota last April in an attempt, sponsored jointly by the university and the fund, to decide whether doctors can "be taught to practise in their own offices the kind of medicine psychoneurotic patients need." The course was conducted by psychiatrists with teaching experience, including four professors and two associate professors of psychiatry, as well as two consulting psychiatrists, two social workers, and an associate professor of medicine. A group of seven neuropsychiatrists helped with the clinical teaching, and the university provided the patients. Morning lectures followed by discussions laid the theoretical groundwork of the kind of medical care the students were to learn; afternoon seminars for the whole group were designed to give instruction in method; the students undertook supervised clinical work, and discussed it at small section meetings consisting of an instructor and five students; and films and special seminars were to be arranged as requested. In practice, the lectures and section meetings proved the best teaching agents, the large group seminars being less successful. The section meetings, with their informal give and take, allowed the students to hammer out the significance of clinical work case by case. The lectures covered such subjects as general orientation, patient-physician relationship, normal personality development, the meaning of a psychoneurosis and its diagnosis, anxiety, general principles of psychotherapy, common psychopathology, combat fatigue, and the care of veterans.

The students took the course hungrily, and "were so full of the subject that they spent hours at night talking with each other and with members of the teaching staff," and they much preferred this to evening seminars or films. Many of the cases seen were of long standing—patients who had had various kinds of medical and surgical treatment elsewhere, and who are all too common in the general practitioner's surgery: "it was an excellent sample of the persistently unwell." The purpose of the interview was thoroughly impressed on the students, this being not so much to get the facts as to find out the patient's attitude to the facts and to help him to tell his own story. They were asked to listen to the patient, to let him know he had undivided attention, and to talk with him for an hour instead of the customary fifteen minutes. The transference and counter-transference were explained, students soon grasped that a positive transference at the first interview gives the patient freedom and confidence, and is a good start for treatment. The instructor usually came in just before the end of the hour and brought out factors the student had missed, or made clear the significance of what the patient had already told him. At the end of the first day one student, speaking of the anorexia of a twelve-year-old said: "Well, then, you talk her into eating." The instructor answered: "You don't talk her into it; you let her talk herself out of the reasons for not doing it."

But in psychotherapy, while principles may be easy to grasp, management of cases can only be learnt by years of training and experience; in the second week the students had to be given some understanding of the possibilities and limitations of psychotherapy—to be shown, in fact, when to go forward with a case and when to leave it alone or seek help elsewhere. Moreover, they had to learn that they themselves were influenced by patients in ways of which they were not fully conscious; and that there were many cases in which they must be satisfied to help the patient to adjust himself to irreversible handicaps, without attempting to cure him. "The patient is a person needing help; the function of the doctor is not to play God, but to give help at any and all points where after thoughtful study he sees the way to do so. . . ."

The result, judged by written comments, was a new orientation of the students to their relationship with patients. Nearly all felt that they had gained help in their daily work. From the instructors' point of view it was clear that the present generation of general practitioners are not too old to learn the psychotherapy they have never been taught: the students at this course were both eager and quick to learn.

THE M.D.U.

IN an annual report of pre-war dimensions the Medical Defence Union gives an account of careful work on behalf not only of its members but of the public. In his presidential address at the annual meeting on Sept. 24, Mr. St. J. D. Buxton, F.R.C.S., reminded members that a joint coördinating committee, made up of representatives of the M.D.U., the London and Counties Medical Protection Society, and the Medical and Dental Defence Union of Scotland has been set up during the year to develop a common policy in matters of mutual interest. On the request of the M.D.U., the British Standards Institution set up a committee (on which the union was represented) to report on methods of preventing avoidable accidents associated with the use of gaseous anæsthetics. This committee have now reported, submitting a "Code of Practice" which should in time do away with all errors due to wrongly coupled leads, and misidentification of cylinders. Copies of this report will soon be available to any member who asks for it.

In answer to many inquiries from demobilised doctors about reinstatement, the union point out that the Act of 1944 provides that an employer must take a doctor back into his pre-war post if he applies for it within four weeks of demobilisation, and "if re-engagement is reasonable and practicable." This second requirement allows of shuffling, and the deliberate evasion of responsibility; moreover, if the post was honorary or only carried a token payment it does not come within the scope of the Act. Some governing bodies of voluntary hospitals have refused to reinstate returning specialists and consultants, on the grounds that they have now given the appointments to others. This attitude, though contrary to the spirit of the Act, unfortunately cannot be attacked on legal grounds. Doctors who held posts in municipal hospitals before the war have not encountered the same difficulty, partly because their appointments were paid and partly because the Act applies to municipal staff as a whole, as local authorities fully appreciate.

During the year the union has successfully prosecuted some unqualified practitioners who have used the titles of "physician," "surgeon," or "doctor" (usually preceded by some descriptive adjective), to which they have no claim. Members who know of unregistered

---

2. Erb, W. *Dtsch. Z. Nervenheilk.* 1898, 13, 1
3. Morrison, H. *New Engl. J. Med.* 1933, 208, 438.

1. Psychotherapy in General Medicine: Report of an Experimental Postgraduate Course. The Commonwealth Fund. New York, 1946.

practitioners contravening the Act in this way are asked to inform the union.

Some of the cases dealt with during the year included questions of fees, *certification*, and *alleged negligence*. The report again impresses on doctors the importance of care in the coupling of anæsthetic cylinders, and the dangers of explosions in the theatre; and on surgeons the need for capable swab-counting, the importance of *X-ray examination of bony injuries*, and the duty which lies on them to establish the diagnosis to their own satisfaction: it is not wise to accept a colleague's opinion and to operate without confirming his findings. One member had found a commercial firm using a quotation from an article of his, published in the medical press, to support their advertisement for a certain form of electrical treatment. Permission to use his name had not been asked. The union protested to the advertisers who withdrew all the remaining pamphlets containing the advertisement and undertook to issue no more of the kind. Other examples of the union's work could be given, for the annual report makes instructive reading; but as Mr. Buxton pointed out, the existence of the M.D.U., telegraphic address "Damocles," should suffice to remind us that the path of the practitioner may be far from easy.

THE MAKINGS OF A MEDICAL SCHOOL

IN the hope that his findings might guide them in establishing a university medical school, the governors of the University of British Columbia asked Dr. C. E. Dolman, their professor of bacteriology and preventive medicine, to make a survey of medical education in Canada and the United States.[1]

Professor Dolman visited the 11 medical schools of Canada, and 22 leading medical schools in the U.S.A., talking with heads of departments, staff members, students, university presidents, deans, representatives of the Rockefeller Foundation, hospital directors, and any others who came his way. His list of requirements for a first-class medical school begins with a stable and flourishing parent university, a large body of good applicants from whom students can be selected, enough money, and a picked staff, of whom the heads of departments and some others are to be full-time. Teaching affiliations with local hospitals, he considers, should be made on terms *satisfactory to the university*; but there must also be a university hospital staffed entirely by the faculty of medicine. The school should be placed in the campus so that the students share the life and interests of their fellows working in other faculties; and the medical faculty must share its resources with the university, offering special courses to non-medical graduates, training students for medical ancillary services, and being fully responsible for a well-developed university health service.

He found, he says, plenty of evidence that a second-class university cannot hope to have better than a second-class medical school. Though fees for the medical course are nearly twice as high as for other courses given in the same university, they seldom meet more than a third, or in some schools a sixth, of the cost, and no university should contemplate founding this expensive form of school unless it has proper resources. Too big a teaching load on staff puts an end to the serious and sustained research which must be among the first duties of a medical school. A good staff, once appointed, must *have proper apparatus for research, and such equipment* quickly goes out of date: "hence no medical school ever seems to find its budget adequate." In the United States he found that the annual cost per student ranged from $600 to $3893; and he had no doubt that the student in the expensive schools got better teaching. Tutorials and seminars are better vehicles for teaching than didactic lectures, but are possible only when the ratio of instructors to students is high; and the atmosphere is more favourable to learning in a school where *research is an honoured activity*, not an intermittent and clandestine indulgence.

The best annual entry, Professor Dolman thinks, is round about 50 students a year. The Goodenough report, it will be remembered, suggested an entry of 100, which he would *consider* too high on the ground that if a class is much over 55 or 60 it has to be split into sections, and a disproportionate number of additional teachers must be provided. Good staff are as scarce in America as here. He notes that in the U.S.A. at least four chairs, and numerous assistant professorships, of anatomy are vacant, and that good pharmacologists are even harder to find than anatomists. Medically qualified men who go in *for full-time* teaching do it at a financial sacrifice, but even so he believes that "without plenty of money one cannot hope to get good men." He is also clear that it is not enough to appoint a single full-time man in a clinical department and leave him dependent for help on part-time workers and volunteers: the result of that is to push the head of the department *into "the rôle* of chore-boy."

In discussing the medical curriculum, Professor Dolman insists that preventive medicine must be better taught, but not to the point of displacing the doctor's traditional concern with the care of the sick. He notes the increasing popularity of joint conferences in which the anatomist, bacteriologist, biochemist, and pharmacologist take equal part with the physician and surgeon. In some of the best schools the department of psychiatry arrange lectures, demonstrations, and seminars, on normal psychology and on the psychological bases of abnormal behaviour, for students in their first and second years. The various departments must be closely interrelated not only in the intellectual but in the physical sense it is hard to coöperate fully over a gap of, say, six mile He believes that every link possible should be forge between the medical school and the general practitione as well as with State health departments. Perhaps hi *most telling observation is that*—"the form and fame a medical school is very largely determined by th character and ability of its first Dean."

MEDICAL RESEARCH COUNCIL

THE Committee of Privy Council for Medical Researc have appointed Group-Captain C. A. B. Wilcock, M.P Dr. C. A. Lovatt Evans, F.R.S. (professor of physiolog in the University of London), and Dr. R. A. Peters, F.R (professor of biochemistry in the University of Oxford to be members of the Medical Research Council.

RETIREMENT OF MR. F. W. MARTIN

WE who produce this journal have lost a value colleague by the rétirement on Sept. 26 of Mr. Marti our head printer. He and his father, W. G. Marti between them held this office for 56 years, and his father' association with THE LANCET began over 70 years ag On July 4, 1893, Frederick William Martin was boun apprentice for seven years to Thomas Henry Wakle F.R.C.S., and Thomas Wakley, jun., L.R.C.P., then pr prietors of THE LANCET, to learn "the Art of Lette Press Printing, which they use"; and until 1921 h worked at 423, Strand, where the typesetting was don above the editorial office. When 25 years ago the print ing was transferred to Messrs. Hazell, Watson, an Viney, in Long Acre, Mr. Martin joined their staff bu continued his close association with the editorial an managerial departments of the journal. Among us h had by far the longest experience of THE LANCET, an he did much to preserve its standards and transmit it tradition. The apprentice became himself a teache and counsellor, and remains a f

---

[1] Report to the board of governors of the University of British Columbia, May, 1946.

Special Articles

CHILDREN IN DAY NURSERIES

WITH SPECIAL REFERENCE TO THE CHILD UNDER TWO YEARS OLD

HILDA F. MENZIES
M.D. Aberd., D.P.H.
DEPUTY MEDICAL OFFICER OF HEALTH, LEYTON

DURING the war there was a mushroom growth of nursery accommodation for children under five years of age. The Ministry of Labour and National Service pressed local authorities to establish nurseries as a means of encouraging mothers of young children to do full-time industrial work. Whether it was really wise to give mothers of young children this encouragement may be doubted (Menzies 1944).

By January, 1945, up to 1500 nurseries had been established with a maximum of 50 children per nursery. Since then about 200 have been closed. The latest estimates of the Ministry of Labour (as quoted in the *Times* of June 20, 1946) show that in the first ten months of peace nearly a million women left industry to return to their homes, and the number actually engaged in civil employment in April, 1946, was 5,420,000. The proportion of women therefore whose children were in nurseries during the war represented rather over 1% of the total number of women in industry, and as a result of closing 200 nurseries a maximum of 10,000 women may have left industry—again 1% of the total who ceased work. This disposes of the argument that the establishment of nurseries has had any appreciable effect on the labour situation.

The statement recently made in a propaganda leaflet, that the ability of women to remain in or re-enter industry "will depend largely on the speedy setting up of more nurseries and nursery schools," oversteps the bounds of justifiable emphasis which one expects to find in propaganda. A more reasonable argument is that nurseries have a contribution to make towards maternal and child welfare; but here again we should look at the facts in correct perspective against the background of general maternity and child-welfare services. The proportion of children under five years of age who were in nurseries during the war was only 2–3%; so the health of young children in general will not so far have been appreciably influenced by nursery provision.

The few nurseries in existence before the war were established for social reasons—to care for children whose mothers had to earn their living, or for those whose home circumstances were unsatisfactory. Curiously enough, there does not seem to be any published record of the progress of these children.

It is perhaps less surprising that the progress of children in war-time nurseries has not been recorded *; for the establishment and supervision of nurseries fell on depleted public-health staffs who had often Civil Defence duties besides their usual work. It seems important, however, that the progress of these children should be watched carefully, particularly if in the future there is to be any extension of nursery provision to make things easier for the tired mother.

Most mothers probably find their young children a trial at times, and those who have to care for one or more young children and run a house unaided have a tiring time; but how many of them will be prepared to secure their own relief unless they can be assured that their children will do equally well away from them? This factor operated even during the war, when there was a good deal of propaganda to induce mothers to go to work. In Leyton—which was not an area with much employment of married women before the war, and has a good standard of maternal care—when we set up two nurseries, for 50 children each, we had 48 withdrawals within one week, and another 36 within four weeks of admission. The majority who left within this time were considered by their mothers to be "fretting." Have we enough knowledge of the development of young children to tell these mothers they were wrong?

Since I have had an opportunity of examining the records of those children admitted before they were two years old who remained in the nurseries over three months, I think it is possible that those mothers who withdrew their children made a wise decision.

The rapid turnover of children in the nurseries is very striking; and, if experience in other nurseries has been similar, this may have been one reason which deterred medical officers from recording the progress of children. It also suggests that the nursery population is selected: the children of whom we have records are those who have stayed the course. In theory one would have expected that with certain exceptions—e.g., children withdrawn because of the mother's pregnancy—a child admitted to a war-time nursery would have remained there until he went to school. Yet in three and a half years in Leyton 368 children (occupying 100 nursery places) have been admitted and left, and of these only 60 (16%) have stayed until they went to school; 54 left within a week of admission, another 47 within a month, and 222 within six months. The obvious retort of the enthusiast will be that the fault is in the individual nurseries, and this may be suggested when my figures of progress of children under two years are read. But I shall be content if the critics record their own experience for comparison. From the remarks of the numerous visitors (official and otherwise) whom nurseries attract, the nurseries in Leyton seem to have been as good as the average, and a good deal better than many. The last inspector we had observed that as soon as she entered the door she could tell that the atmosphere of the nursery was good.

PROGRESS OF CHILDREN UNDER TWO YEARS OLD

Gain in weight is the most obvious tangible evidence of progress in the young child.

I have so far only tabulated the progress of children who were admitted to a nursery before they reached the age of two. This appears to be the most important group to study in the first place, because these children are not yet old enough to benefit from association with other children, and there are certain obvious risks—namely, fretting through separation from the mother, and infections.

GAINS IN WEIGHT

Age on admission (months)	Nursery	In 3 months		3–6 months		0–12 months	
		No. of children	Av. gain (lb.)	No. of children	Av. gain (lb.)	No. of children	Av. gain (lb.)
12–18	A	26	1·00	20	1·17	9	5·30
	B	32	1·40	24	1·34	16	5·12
18–24	A	15	1·49	10	1·08	3	4·29
	B	27	0·96	20	1·38	11	5·00

Of those admitted under two years old 76 left within three months, and it is therefore impossible to make any record of them.

In children under a year old the gain in weight is very definitely related to the month of life. The numbers in the nurseries at this age were not large enough to subdivide them; but, of 32 children who were admitted in their first year and stayed more than three months, 8 gained 0–8 oz. in weight in the first three months in the nursery, and another 7 gained 8–16 oz. An average gain of a child at this age, putting it at a low estimate, is 1 lb. a month.

---

* Since this paper was written a report on the health of children in war-time day nurseries has been published in the *British Medical Journal*, August 17, p. 217.

The accompanying table shows the gain in weight in the first three months, in the second three months, and in the first twelve months of two groups in each nursery —those admitted when they were between twelve and eighteen months old, and those admitted when they were between eighteen months and two years old. Besides the average gain in weight in each group over the period stated, I have indicated the number of children in each group on which the gain in weight is calculated. It is obvious that the number who remained in the nurseries for a year or longer are a selected group, and the number in each age-group is too small to justify any definite conclusions. The average gain in weight of children between one and two years old may be considered to be 5–7 lb.; hence these gains appear to be at the lower limit of normality.

To take the average gain conceals the progress of individual children; but, of 58 children admitted at ages between twelve and eighteen months, 3 lost weight in the first three months, 9 gained 0–8 oz., and a further 9 gained less than 1 lb. Thus over a third made unsatisfactory progress in the first three months. In the second three months 2 children lost weight, 5 gained 0–8 oz., and 4 gained less than 1 lb. The total number of children here was 44; so a quarter made unsatisfactory progress in the second three months.

Of 42 children admitted aged between eighteen months and two years, 7 lost weight, 3 gained 0–8 oz., and 5 gained less than 1 lb. in their first three months in the nursery—i.e., in a third the gain was unsatisfactory. In the second three months out of 30 children 2 lost weight, 6 gained 0–8 oz., and 3 gained less than 1 lb.

As children in nurseries are in a favoured position as regards rations, compared with children whose mothers are looking after them at home, I regard the progress of these groups of children admitted under the age of two years as disappointing. It is reasonable to suppose that illnesses explained the poor gains to some extent, but this cannot be the whole explanation, because some children had as many as four infections and progressed satisfactorily, whereas others had no illness and yet did badly. Nor does it seem possible to foretell which child will do reasonably well and which will do badly. The fact that a child has had poor maternal care does not necessarily lead to its doing well when admitted to a nursery. Thus in a child aged between eighteen months and two years, with the note "care poor, verminous, went to residential nursery," there was a loss of weight of 15 oz. in the first three months in the nursery, and a gain of 15 oz. in the second three months. In that time the only illness was German measles. Another child, who was a removal into the district and whose mother appeared to have a low standard of care, gained 11 oz. in the first three months and lost 3 oz. in the second three months, again without having anything more serious than German measles. Of all our admissions we had only 1 child with chronic malnutrition from lack of food, and this child did well, gaining 3 lb. 12 oz. in the first three months, and 3 lb. 3 oz. in the second three months. Children whose general nutrition on admission was poor from no obvious cause did nothing spectacular.

In February, 1943, a warning was issued from the Ministry of Health to medical officers that nutrition in nurseries, particularly of children between one and two years of age, was in some areas less good than it should be. This was considered disturbing in view of the fact that nursery children got extra rations. It was evidently assumed that this poor nutrition in nursery children was due to some lack in nursery dietaries, for medical officers were advised to review the dietaries of the children, and extra iron was made available.

From the time the nurseries opened in Leyton in August, 1942, I had gone over the menus very carefully with the matrons. We had insisted on every child having cod-liver oil and fruit juice daily, and I had ordered a preparation of iron for those children who seemed to need it. I am not therefore prepared to agree that failure to gain weight adequately in the cases I have listed is due to anything so simple as lack of proper food. It seems more likely that it is due to emotional disturbance, and if this is so it is much more serious.

It is not unusual for a young child to take anything from a week to a month to settle. This period of adjustment *to unknown people and surroundings* may be characterised by continuous or intermittent crying, refusal to eat, refusal to sleep, or refusal to sit on a chamber without screaming. It is an unhappy time for all concerned.

Susan Isaacs (1932) mentions that emotional causes may affect weight gains in young children. Freud and Burlingham (1943), who made a detailed study of children in residential nurseries, found that in children from one to two years old the motor control was better in nurseries than in homes where freedom to move was restricted, but that the nursery child "is at a disadvantage wherever the emotional tie to the mother or to the family is the mainspring of development. Comparisons between children under these contrasting conditions serve to show that certain achievements such as speech and habit training are closely related to the child's emotions, even though this may not be apparent at first glance."

It is recognised now that too early and too strict habit-training in babies may lead to a relapse later on. Bowley (1942) says that bowel control should not be expected before the age of twenty-one months, and bladder control before that of twenty-four months. In our child-welfare clinics we advise the mothers on these lines and warn them of the dangers of overinsistence on cleanliness, but in nurseries it is inevitable that strenuous attempts at habit training should be made with the under-twos. "Potting time" is recognised in the nurseries as a time for squalls. The dangers of gastro-enteritis in young children have been brought back to us in recent years with the rise in the death-rate from gastro-enteritis in children under two years old, and this more obvious risk is bound to determine procedure in nurseries.

The social development of the child is tied up with his emotional development. So if this failure to gain weight adequately is evidence of an emotional hold up, the effect may be far-reaching.

INFECTIONS

At one nursery 54 children out of a total of 72 (admitted under the age of two years) who remained longer than three months in the nursery developed one or more infections. At the second nursery the proportion was 35 out of 60. The commonest infections were of the catarrhal type—measles, whooping-cough, German measles, bronchitis, and pneumonia, but scarlet fever mumps, dysentery, jaundice, and chickenpox all occurred. Some children had as many as *four* infections, and of 60 children (including the admissions under the age of twelve months) who remained twelve months or more in the nurseries, only 7 escaped infection. I counted acute bronchitis only if it led to several weeks' absence from the nursery.

A preliminary study of infections in war-time day nurseries was made in Oxford from the Institute of Social Medicine (Allen-Williams 1945), and from the records analysed it appeared that children attending day nurseries were more liable to contract infections than were children living at home, and the infections occurred at an earlier age in the day-nursery population. The investigator discussed the likelihood of the infection-ates being underestimated in both sets of records, and ssumed that the nursery records would be more complete s the children were under daily skilled supervision. That might be a safe assumption so far as the Oxford ecords were concerned, but anyone who remembers he conditions in London war-time nurseries will agree hat the matrons there had every excuse for not recording on the children's cards all their absences through illness. There was usually a shortage of staff, and, particularly from June, 1944, the children were in and out of air-raid shelters all day long. Careful recording was the last thing one could expect under such conditions.

EXPRESSIONS OF OPINION

Kershaw (1946) criticised the Oxford survey as being at the same time too scientific and not scientific enough, and in his criticism he betrayed a bias in favour of nursery provision, but he did not provide any facts to back his opinions. In his own words "We have tended to rely too much on general impressions often coloured by preconceived ideas."

Other expressions of opinion have been made recently.

> "The scope of the evidence is admittedly limited, but so far as it goes it does not indicate a beneficial effect of nursery life for the younger children—rather the reverse. There was a general increase of respiratory infection, to a significant extent in some instances, but no constant or significant improvement in physical development as indicated by weight or the doctor's impression of general physique" (Medical Women's Federation 1946, in a report based on the records of 4587 children in 22 local-government areas).

> "The advantages of a day nursery or nursery school are much greater (than a home help) for the child. A child needs training and discipline from the very beginning of its life, and this training can only be suitably given when there are facilities for mixing with other children. . . The children are taught regular habits, are given well-balanced meals adequate in quantity and quality, and have proper periods of rest and sleep as well as of activity" (Paul 1946).

> "The danger of infection was there but was just a thing to be overcome. Good nutrition was one safeguard. The social benefit of mixing of children was great and he doubted if the family was always the best place for their bringing up" (Roberts 1946).

> "Day and residential nurseries have contributed a good deal to the improved knowledge and actual nutritional standard of children" (*Nutrition and Child Welfare* 1946).

I shall look forward to reading the investigations which would justify such opinions. I am not in a position to make any such definite statement, but as the result of studying the progress of children under two years old, admitted over a period of three and a half years to two war-time day nurseries in London, have come to certain conclusions.

CONCLUSIONS

Of children under two years old a substantial proportion do not make satisfactory progress on admission to a day nursery, as judged by their weight gains in three-monthly periods. This is in spite of the fact that over the period under review children in nurseries had available what amounted to almost double rations compared with children whose mothers cared for them at home, and that a very careful attempt was made to satisfy the dietary requirements of young children in the nurseries I have been supervising.

It is recognised by psychologists that emotional disturbance interferes with weight gains in young children; and, as it is obvious from their behaviour that these children do suffer an emotional upset on admission to a nursery, this may explain their failure to gain weight adequately. It is not necessarily possible to tell from their subsequent behaviour whether they are making satisfactory gains in weight.

Most of the children admitted under two years old who stayed in the nurseries developed one or more [illegible] tions sooner or later. The extent of the infection-rate is less obvious owing to the practice of accepting on the register about 20% more children than there are places available in the nursery, but a recent epidemic of measles in one nursery reduced the attendance to 14.

In considering what proportion of children in these ages do or do not make satisfactory progress, and do or do not develop infections, account must be taken of the number who leave either because their mothers consider they are fretting, or because they contracted an infection from the nursery. There is a tendency to forget about them. The mother does not attend mass meetings to describe the effect of the nursery on her child. She simply removes the child.

We require guidance from those best qualified to judge what is the earliest age at which a normal child may be removed from his mother, home, and familiar surroundings, and for how many hours a day, without the likelihood of experiencing emotional upset. As a corollary to this, at what age does the young child begin to benefit from mixing with other children?

The opinions expressed here are personal and are not intended to represent those of the borough of Leyton.

REFERENCES

Allen-Williams, G. M. (1945) *Lancet*, ii, 825.
Bowley, A. H. (1942) The Natural Development of the Child, Edinburgh.
Freud, A., Burlingham, D. (1943) Infants without Families, New York.
Isaacs, S. (1932) The Nursery Years, London.
Kershaw, J. D. (1946) *Lancet*, i, 107.
Medical Women's Federation (1946) *Brit. med. J.* ii, 220.
Menzies, H. (1944) *Occup. Psychol.* 18, 76.
Nutrition and Child Welfare (1946) 1, 19.
Paul, H. (1946) *J.R. sanit. Inst.* 46, 322.
Roberts, L. (1946) cited by *Med. Offr*, 75, 250.

INTERNATIONAL MEDICAL CONFERENCE IN LONDON

A CONFERENCE at which 21 European countries and 10 countries outside Europe were represented was held at the British Medical Association House in London on Sept. 25–27. The meeting was under the joint auspices of the Association Professionelle Internationale des Médecins and the British Medical Association, whose president, Sir Hugh Lett, was in the chair. Most of the national medical associations were represented by two delegates, and some of them by observers also; the American Medical Association was represented only by observers. Delegates from both the Palestine Arab and the Palestine Jewish Medical Associations were present.

Sir HUGH LETT, in welcoming the delegates, mentioned the interest of the B.M.A. in international coöperation, as testified by its recent allocation of money for sending medical lecturers to the Continent, and also by the forthcoming establishment of an abstracting service to cover all medical literature.

OBJECTS AND FUNCTIONS

On the motion of Dr. ALFRED COX (B.M.A.), seconded by Dr. P. MORAN (Irish Free State Medical Union), and supported by the Polish, Spanish, and Swedish delegates it was unanimously agreed that an international organis tion of medical associations should be set up. A lo discussion on the objects of such a body centred larg on whether these should be limited to matters of med practice and social medicine or extended to scier coöperation. The Polish delegates wanted scie medicine included, but this was resisted by the Fr Belgian, Greek, and Dutch delegates, who point that every country had its academies, and th immediate need was for an organisation to def rights of the ordinary practitioner, especially of legislation passed or pending in many [illegible] (Canada) suggested body might serve as the medical counterpart to the World Health Organisation recently established in New York. Without the help of the medical profession in the different countries, he said, the W.H.O. would be like an electric grid without power; no national governments could do anything with this new instrument unless the doctors in every country made it alive. What he desired was a world medical organisation to signify the unity of the world's doctors, knowing no geographical boundaries and concerned only to help mankind to attain the highest possible level of health.

A whole morning was spent in considering various formulas to express the objects of the world association. Ultimately the following was agreed to:

> "To promote closer ties among the national medical organisations and among the doctors of the world by personal contact and all other means available in order to assist all peoples of the world to attain the highest possible level of health; to study the professional problems which confront the profession; to organise an exchange of information on matters of interest to the profession; and to establish relations with, and to present the views of the medical profession to, the World Health Organisation and the United Nations Educational, Scientific, and Cultural Organisation."

The last phrase was arrived at after the rejection of a number of alternatives. Dr. P. CIBRIE (France) declared that in his country there was some suspicion of the W.H.O. and of UNESCO. Should these bodies assume bureaucratic functions, any agreement to coöperate with them would prove embarrassing. Dr. F. DECOURT, secretary of the A.P.I.M., spoke to the same effect. One of the reasons for the establishment of a world medical organisation, he said, was to defend medical practitioners' liberty, now menaced in several countries; to proclaim in advance that they were prepared to coöperate with these new official organisations would be unwise.

Dr. G. B. CHISHOLM, as an observer representing the World Health Organisation, said that under the W.H.O.'s constitution there would be no interference with the practice of medicine in any country. He quite understood the concern at possible regimentation of the profession; the interim commission which was now engaged in framing the constitution of the organisation was well aware of that concern. There would be no attempt to control the practice of medicine. On the contrary, the new organisation desired the advice of bodies which could speak for the medical profession; and it was ready to do all it could towards improving the health of the people.

NAME AND CONSTITUTION

Several delegates wished the name of the old body, the A.P.I.M., to be retained, but an amendment to this effect was defeated by 22 votes to 14. The suggestion that the name should be "World Federation of Medical Associations" was opposed by some countries, owing to the implications of the word "federation." Ultimately, on the proposal of Dr. I. C. MICHAELSON (Palestine Jewish Medical Association), seconded by Dr. J. A. PRIDHAM (B.M.A.), the title "World Medical Association" was agreed to.

It was also agreed that the members of the World Medical Association should be national medical associations. It was pointed out that in some countries more than one medical body could claim that rôle. Dr. CIBRIE, who said that in France there was only one representative body, the Confédération des Syndicats Médicaux Français, suggested that the criterion for admission might be that the membership must include half or more of the country's practising doctors.

It was agreed that the medical associations represented by delegates or observers at the conference should be eligible for membership, together with an[illegible]al or territorial medical association which was representative of the medical profession in its country or territory.

The subscription was fixed at half the rate for the A.P.I.M., the reduction being made in view of the straitened circumstances of several countries. Accordingly, the subscription will be 10 Swiss centimes per member of each national group, up to a total of 10,000 members; and 5 centimes per member above the first 10,000, with a maximum of 1500 Swiss francs.

It was also agreed, subject to consideration by the provisional committee which was to be set up, that each member-association should have two seats on the governing body or conference, and that voting should be by countries. This implies one country one vote, with exceptions, such as Palestine, where there are two medical associations representing different races.

A claim was made on behalf of the British Medical Students Association, which was represented by observers, that the medical faculty-group of the International Union of Students should be admitted a member. This was opposed by the French and Belgian delegates, but the conference agreed to recommend to the committee that the two representatives should be admitted, but without voting power.

COMMITTEE AND SECRETARIAT

It was agreed to set up a provisional committee of nine, and to entrust to it the task of putting into French and English—the two official languages of the new body—a draft constitution and bylaws embodying the recommendations made by the conference. This will be submitted to the next conference, the first meeting of the World Medical Association, which, it was recommended, should be held in Paris, on a date to be decided by the committee.

The following were elected, by ballot, members of the committee:

Dr. F. Decourt (France), Dr. P. Glorieux (Belgium), Dr. Dag Knutson (Sweden), Dr. O. Leuch (Switzerland), Dr. J. A. Pridham (Great Britain), Dr. T. C. Routley (Canada), Prof. I. Shawki Bey (Egypt), Dr. L. Tornel (Spain), and Dr. A. Zahor (Czechoslovakia).

It was further agreed that there should be a dual secretariat, one secretary to be in London and the other in Paris. Dr. Charles Hill (secretary of the B.M.A.) and Dr. Cibrie were appointed to act in these capacities until the next conference.

Regarding the future programme, Dr. MICHAELSON suggested that the committee should obtain information as to the number of refugee doctors who are still not absorbed, and determine a general absorption rate sufficient to give employment to all refugees. The new association might act as a clearing-house for the resettlement of refugee doctors.

At the close of the conference, Sir HUGH LETT, replying to a vote of thanks, said that it had been a great privilege to preside. If only international coöperation could be secured between the medical men of different countries a big step would have been taken towards permanent peace. He wished to acknowledge the public spirit shown by Dr. Decourt and others in sustaining the old A.P.I.M. through difficult years and consenting to the new organisation taking the place of the old.

GOVERNMENT LUNCHEON

The delegates and observers were entertained by the Government to luncheon at the Dorchester Hotel, Mr. Aneurin Bevan, the Minister of Health, presiding. Mr. BEVAN expressed his appreciation of the initiative and imagination of the British Medical Association in summoning the conference. "There is no more important contribution that citizens can make towards universal appeasement than to meet each other as fellow craftsmen d as members of the same profession." When politi- ns got together, friction of various kinds was likely arise, but doctors in their assemblies "are not primarily ncerned about who is going to do a thing, but that the ing is going to be done." It did not matter to the ctor whether the patient were black or white, brown yellow, Communist or Fascist. "There is in medicine catholic interest and dedication to the welfare of ankind, a concern for the individual, quite indepen- ently of his social group, his inheritance, origin, or estination. It is therefore of supreme importance that ie organisation which has been born today should ave a successful inauguration and be continually istained by the enthusiasm of its founders and those ho come after them." Dr. J. A. PRIDHAM and Dr. P. LORIEUX replied.

The council of the British Medical Association also ave a dinner at which the presidents of the three Royal olleges were present. On the last afternoon of their tay the delegates, at the invitation of Sir Alfred Webb- ohnson, paid a visit to Middlesex Hospital.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS

MR. BEVAN'S LETTER ON MATERNITY SERVICES

AT a dinner held in London on Sept. 27 Lord WOOLTON, proposing The College, spoke of the distinction between being governed by public opinion—by the trust we have n one another—and being governed by edict and legis- ation. However high its own standards, the Government had perhaps something to learn in this connexion from the Royal Colleges, whose lack of specific powers made them all the more powerful. As a friend of Blair-Bell, founder of the college—"a great dynamic force constantly searching out new things"—Lord Woolton was glad to see that the dream had come true.

Recalling how, many years ago, he and his wife started one of the first maternity clinics, and the first antenatal clinic, in the North of England, Lord Woolton said that when he became Minister of Food he regarded it as an opportunity to do something to raise the standard of maternal and infant life, and in this he had been fortunate in having the help of Lord Horder and Sir Jack Drummond. By directing cod-liver oil, orange juice, and other supplements to pregnant and nursing mothers "I think we did something." No Minister could go ahead of the general sense of the public without being called an idealist, but as soon as he declared his policy of putting children first, Lord Woolton had ceased to get abusive letters about rationing: "the public thought I was right." There could be no wiser expenditure of public money than on preserving child life.

Mr. EARDLEY HOLLAND, responding as president, said that the college had grown rapidly in its 17 years and was hoping soon to receive a royal charter. Two-fifths of its existence had been in the difficult years of war, in which its members, unlike physicians and surgeons, had usually had to turn to different tasks. But the membership, which before the war was 580, was now 775. No less than a quarter of the fellows and a third of the members lived and worked in the Dominions, and the college was very proud of its Dominion fellows, many of whose departments were second to none in this country, and wanted them to have more part in its work. It was to hold an examination in Australia next year, and Sir William Fletcher Shaw, his predecessor as president, was even now on his way to Australia to make arrangements. Being still young, the college had still to work its way to fame by the quality of its work, and among the many subjects being discussed by its committees were population problems, human fertility, analgesia in childbirth, neonatal mortality, maternity hospitals, and the social and economic aspects of the maternity service. For the Royal Commission on Population it had undertaken a questionary of considerable difficulty, and in 1944 it had issued a memorandum on a National Maternity Service which already seemed to have influenced the planning of a service and the Government's Bill.

During the last few years, Mr. Holland continued, there had been a great change of outlook on obstetric practice. The "new obstetrics" must be practised on a broad national basis and was concerned with the social and economic factors. Obstetrics had, moreover, become a form of "precision practice" very different from the old. With blood-grouping, tests for rhesus factor, and radiological examination becoming matters of routine, and with new techniques against infection and shock, obstetrics had been completely transformed in the last ten years. As the techniques became more precise the standards of accomplishment must be raised among all who did midwifery—whether midwives, general practitioners, or specialists. This year the council had decided to double the period of training required of candidates for membership. While the college believed that the general practitioner should play a most important part in the maternity service, it maintained that only practitioners with postgraduate training or special experience should be considered capable of going to the aid of the midwife in difficulties.

The National Health Service Bill would become law in a very short time, after which "we shall have to get round a sort of peace conference table, but with more hope in our hearts than in Paris." In April, 1948, he felt sure, "we shall, like loyal citizens, carry out the will of the people and do our best to make the finest maternity service in the world." In time it should be possible to secure throughout the country an even distribution of those techniques now waiting to be used. The college's memorandum had laid emphasis on coördination between the various bodies which under the Bill would be responsible for the maternity service. The Minister had said that perfect coördination could be assured by administrative action, and in answer to a request for fuller information had sent him a letter which said:

> We have always envisaged that in staffing their antenatal clinics local authorities must enlist the coöperation of the regional board, and that this will be done by appointing one of the hospital obstetricians as officer in charge of each of the local antenatal clinics. This would enable the obstetrician to determine whether the mother will ultimately require admission to hospital (and to take the necessary steps accordingly) or whether she can be left to the care of the midwife, with the facilities of the hospital or the services of an obstetrician or experienced general practitioner always available in the background. This arrangement would ensure also that the social services of the local authority in the shape of the health visitors would be at the disposal of the obstetrician in the clinic, and similar service will of course be at his disposal by arrangement with the local authority in the hospital. But above all *we must* remember that the general practitioner is one of the chief coördinators of the service. He is the manager who produces for the benefit of his patient all the facilities which the National Health Service can offer. He will have contacts with all the working parties of the machine—the hospital, the clinic, the health centre, and the services of the local authority—and will personally know the men and women who staff them.
>
> We have *still* a good deal to do in planning out the precise details of the organisation, but these are the main lines along which it will be developed.

Royal colleges, said the president in conclusion, set the standards of specialist practice and therefore of all practice. "The college spirit in medicine is precious, is unique, and is peculiarly British, and its flame must never die down"; but the colleges must continue to make progress: their power and prestige now depended not on privileges but on cultural and even spiritual qualities. "Many of us believe that instead of working in complete isolation, like independent sovereign States, the colleges will come to work more and more closely together," and it was essential that they should achieve unity and harmony. It was essential too—though the day might be far distant—that they should come together geographically. His own college would in any case soon be forced to move house because in more ways than one it had grown out of the premises given it by its founder.

Mr. A. A. GEMMELL proposed The Guests, whom he included in the definition of the college as "a fraternity with a common purpose." Among those he mentioned was

Mr. Victor Bonney, admitted to the fellowship earlier in the day. Without going so far as to apply the parable of the lost sheep, Mr. Gemmell admitted that "there is more joy in our ranks because he has joined us than there would be over any other man."

Sir HUGH LETT, president of the British Medical Association, in reply, said that today no-one would be bold enough to put the question "is your college really necessary?" Before the college was founded the situation of surgery, medicine, and obstetrics recalled the old-fashioned bicycle in which there were two big wheels and a little one which ran behind without anybody noticing. In the last few years obstetrics and gynæcology had advanced so rapidly that it was essential to have a body like the college not only to lead developments but to speak with authority. Medicine was not only a great profession; it was the ideal profession: no other calling offered such opportunities for development and pursuit of the finest ideals. The ideals often met with disappointment in practice, but it had been well said that the joy of an ideal lies in its pursuit.

After touching on the risk of dividing medicine into specialties, which might lead the doctor to overlook the whole of the patient, Sir Hugh spoke of the danger that people in certain departments of medicine should regard themselves as the profession. It was of the greatest importance at this time that the profession should feel itself united and express its voice in such a way as to impress those in authority. Unity must be secured between the colleges themselves and between the colleges and other professional organisations. The work of the colleges was a special academic work, for which they were particularly fitted, but other things could be done only by such a body as the British Medical Association. One could not always be sure that the "will of the people" would bring about the good of the patient. Medicine should speak with one voice on what it believed to be in the best interests of the people as well as of the profession.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE University of Edinburgh is planning a considerable extension of its premises. For many years now the accommodation in the university buildings has been wholly inadequate, and in the period after the war of 1914–18 new departments were built on the south side of the city some distance away from the old university buildings and from the medical school. As a result the university was scattered rather widely over the city with a consequent loss of corporate sense and much inconvenience to all concerned. The present plan has been prepared for the university by Dr. Holden in consultation with Sir Patrick Abercrombie and Mr. Plumstead, the town planning officer for Edinburgh. Principal Sir John Fraser publicly described the plans some weeks ago and emphasised the urgency of beginning to put them into effect. The Edinburgh town council has now expressed its general approval, at least in principle, of the first stage of the development, and Sir John Falconer, the lord provost, has given the scheme for the formation of a university precinct his blessing.

It is intended that almost the whole area between the present old university buildings in the South Bridge at one end, and George Square and the Meadows at the other, should become a university area without interfering with the principal traffic routes which pass through this part of the city. The plan foresees the construction of teaching buildings on all sides of George Square with university hostel accommodation in Buccleuch Place and its neighbourhood. It is intended to develop the medical school by extending its buildings from the present New Quadrangle in Teviot Place backwards to include the north side of George Square. This will mean a great increase in accommodation for the various departments of the medical school. It is understood that the new building programme will not involve the abandonment of the buildings at West Mains Road, which are mainly occupied by departments of the faculty of science, but the arts and other faculties still accommodated in the old university buildings in South Bridge have been in a hopelessly cramped situation, and the provision of additional and better premises for these faculties is an urgent matter.

Public Health

Prospects in Industrial Medicine

A CONFERENCE held at Leeds last summer[1] reviewed the difficulty of giving medical care to people working in small factories—some 53% of the whole industrial population. Accidents and disease are commoner in these small factories, as Dr. C. G. Kirkland pointed out. He suggested that a mobile corps might be formed for factories, to take the doctor to the job. Dr. J. Vaughan Jones thought the care of people in these smaller factories could not be left to voluntary effort. In one or two places—at Bedford, and at Cray in Essex—small firms have grouped themselves together to provide medical care for workers, but such schemes he believes are not likely to become widespread: the interests of small firms are too diverse. He upheld the view of the Leeds joint council that industrial medicine should be a statutory service, regionally planned. The statutory principle was supported by nearly all the speakers. Many doctors felt that because they were paid by the firm they were at a disadvantage with workers, who suspected them of being "gaffer's" men, more interested in production than in the health of the producers.

Discussing the organisation of a statutory service, Dr. G. F. Keatinge said it would not do to put the responsibility of medical supervision on the existing examining surgeons, because they can only give a limited amount of time to the work; besides, their approach is personal instead of being environmental and occupational. He thought that a corps of specialists in industrial medicine should be formed, to be called occupational health officers. They would be the next link in the chain after the school medical officer, supervising conditions for the worker from his entry to industry to the end of his working life.

Many speakers noted that while the industrial medical officer can recommend alterations in working conditions, he has at present no authority to demand them. As a State servant he would be able to insist that workshops were maintained at the statutory level; though, as Dr. N. J. Cochran remarked, this might limit him, too: an intelligent doctor employed by the firm could suggest improvements beyond the statutory level.

It was generally agreed that industrial health research falls short in scope, speed, and operation.

The General Register Office

The branches of the office which were evacuated to Blackpool at the beginning of the war have now returned to Somerset House, London. The Registrar-General and a small staff remained at Somerset House throughout the war, but the general work of the office has been carried out at Blackpool. The records of births, deaths, and marriages were arranged and indexed there and then sent to Somerset House to be kept in the vaults. The whole of the office is now housed in London, except a part of the statistical branch and the whole of the Central National Registration Office which remain at Southport.

Infectious Disease in England and Wales

WEEK ENDED SEPT. 21

Notifications.—Smallpox, 0; scarlet fever, 853; whooping-cough, 1610; diphtheria, 240; paratyphoid, 17; typhoid, 13; measles (excluding rubella), 1208; pneumonia (primary or influenzal), 312; cerebrospinal fever, 30; poliomyelitis, 28; polio-encephalitis, 3; encephalitis lethargica, 1; dysentery, 60; puerperal pyrexia, 106; ophthalmia neonatorum, 69. No case of cholera, plague, or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (1) from an enteric fever, 1 (0) from measles, 0 (0) from whooping-cough, 3 (2) from diphtheria, 38 (3) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 266 (corresponding to a rate of 30 per thousand total births), including 41 in London.

---

1. Industrial Medicine. Report of Conference held in Leeds on June 20, 1946, by the Leeds Joint Council on Industrial Medicine, the Burton-on-Trent Advisory Council on Industrial Medicine, and the Derby Advisory Council on Industrial Health.

In England Now

A Running Commentary by Peripatetic Correspondents

THE "squatters" have only recently burst on astonhed newspaper readers. But the game is not new, s several hospitals can testify. One hospital urgently eeded a large house and actively tried to obtain it. But he process of purchase and derequisitioning takes an mazingly long time and the house stood empty for nonths. So the homeless understandably assumed that ince the war-time residents had long since gone, no-one vas coming in; so in they went. How to get them out s another matter, but if the "usual channels" in Whitehall had not been so long, twisting, and clogged he trouble would never have arisen.

Another hospital, warned of its friend's dilemma and being itself endowed with the experience of many centuries, bought a house, and, since on the day it was derequisitioned the keys were not forthcoming, it applied padlocks to the outside of all the doors just to make sure. Thereafter it could set applications for licences in motion in a fairly secure frame of mind, and in the hope that its bombed-out nurses might some day find a resting place. But alas, that was too easy. The applications having gone the rounds for some two months and no answer having arrived, the premises had to remain unoccupied, and a new requisition order was issued by a different authority. And so the battle for derequisitioning started all over again. Meanwhile the nurses are thinking of doing a bit of squatting on their own account.

* * *

It was balm to me, as one of that ignorant class who learn most of their nutritional theory and practice from the daily press, to read in my evening paper the suave statement that "the reduction in the extraction-rate, nevertheless, will mean that bread will have a greater nutritional value, as the 5 per cent. reduction is equivalent to that amount less bran going into the bread." And, having read it, I was immediately in an awful state of mental conflict. Did not this contradict the assurances, so smoothly proffered, that previous increases were all for the good of our health and "nutrition"? Had I not read not so long ago an opinion of one of the Highest, that the (then) darker loaf was to contain more and more of five specified things and of a sixth class "some of them possibly not yet discovered"?

Well, I took the trouble to look it up, and I *had* read it all. I now suspect that these dizzy changes in our extraction-rate are but one voice in an elaborate counterpoint, grandly interpreted by the Public Relations Officer virtuoso on an instrument composed of "our medical and scientific advisers." I was pained to find how often I had meekly made a virtue of a necessity, gobbled up temporary surpluses, and skated round less temporary shortages. Of course I do not know whether the statement which set me inquiring was, or was not, part of an official hand-out. Perhaps it came from the Opposition. I hope it did; otherwise I could only say to the official spokesmen "Bah! Eat your words—they're so nutritious."

* * *

This complex modern life has given rise to an ever-increasing number of occupational diseases, and the participants in such a characteristically civilised activity as a world war have added their quota of martyrs to the inventive genius of mankind. For example, that vehicle of death, the jeep, has so often traumatised the posteriors of its hardy occupants and caused inflammation to arise in previously unsuspected pilonidal sinuses that the American Army Medical Corps has dubbed this complaint jeep disease.

But places and circumstances as well as machines have their own particular hazards. I well remember a winter spent in a much-bombed Italian market town, where there was, for some reason, a great dearth of manhole covers. This, combined with the black-out and a certain partiality for indulgence in the local "vino" on the part of our troops, made me familiar with a syndrome characteristic of the place. The essential features were a laceration of one supra-orbital region, occurring late at night in a somewhat alcoholic member of the Armed Forces. There was sometimes a concomitant abrasion of the shin, but this was usually trivial. Cases of this syndrome were seen at the rate of one a night on an average, and I was more annoyed than surprised when I was summoned from bed one winter night to yet another case. He appeared quite typical at first, except that the degree of alcoholisation was rather more profound than usual, and some difficulty was experienced in getting him to the theatre under his own steam. I was in the middle of my surgical procedure, conducted under local anæsthesia, when the patient announced with a great wail of distress that he had gone blind. I was taken aback by this and cursed myself for allowing my somnolence to make me omit even a cursory examination of the central nervous system: there had recently been a few cases of blindness among American troops in the neighbourhood who had drunk wine fortified by the natives of the place with methyl alcohol. Telling the patient not to worry I hastily completed my operation and proceeded to a more detailed examination. On inspection of the eyes it appeared to my relief that the cause of his ocular symptoms had been merely an alcoholic inability to open the eyes voluntarily. "Thank God, doctor," said the patient, with a cry of relief at his deliverance. "I can see quite all right now. You know, doctor," he added, "you're the most beautiful sight I've seen for ages." Even my wife hardly ever says that to me. But then she hardly ever touches alcohol.

* * *

In medieval times the view that disease in general, and plague and pestilence in particular, was a punishment for sin, was deep-rooted in the minds of men: and the gradual elimination of this vigorous superstition has been achieved slowly with the advance of medical knowledge and better understanding of the nature of disease. Through the accidental circumstances of their usual method of transmission, the venereal diseases, and these alone, still incur the judgment and condemnation of the stern moralist. Perhaps it is to the religious convictions of our forefathers, therefore, that part of the abnormal response to fear of these conditions must be attributed. The effects are variable and depend largely on mental balance and stability, but the apparently normal are not without their idiosyncrasies.

In better times, at this season of the year, it has been customary for our clinic to be invaded by workmen who render us acutely uncomfortable for a time, but leave us neat and shining with a coat of glossy paint. Sometimes they have expressed fears of contagion, but the rough and ready reassurance of our permanent staff has sufficed to calm these fears. This year we had to be content with a washdown of the walls and distemper on the ceilings. This year, too, the consternation of the workmen was exceptionally violent, and our technique of reassurance, spiced with ripe comment, failed to satisfy. The workmen were off their food, and the foreman's wife sternly forbade him the solace of the connubial bed until the danger was past. It was a bitter pill to us that we could *not* reassure them, and that our own year-long heroic defiance of the danger went for naught. Yet it had its advantages. It is long since men were seen to work so hard. The spirit and devotion of Dunkirk and D-day were born again, and wonders were wrought with almost incredible rapidity. It is hard to believe that sympathy with the foreman's predicament was the compelling factor, and the result must be attributed to a desire to restrict the period of danger. We are prepared, at a fee of course, to give advice to working parties on the proper application of the spirochætal spur and the gonococcal goad.

* * *

How quickly does fame depart! A recent examination of candidates for a postgraduate diploma in child health produced the favourite chronic arthritis child who is always a good topic for cross-examination—of the candidate. The usual gambit led up to the name of Still. The usual question as to who Still was produced the unexpected answer that he was an American. Lend-lease is all very well but this is going too far. It conjured up visions of George Frederic having an academic discussion with Andrew (somewhere in the shades) on the use of chiropraxis in the treatment of chronic arthritis in childhood. However, medical history is not a compulsory subject, so this candidate fared better than the one who remarked "If the W.R. excludes G.C., it's O.K."—surely the maximum of error combined with the maximum of irritation.

Mr. Victor Bonney, admitted to the fellowship earlier in the day. Without going so far as to apply the parable of the lost sheep, Mr. Gemmell admitted that "there is more joy in our ranks because he has joined us than there would be over any other man."

Sir HUGH LETT, president of the British Medical Association, in reply, said that today no-one would be bold enough to put the question "is your college really necessary?" Before the college was founded the situation of surgery, medicine, and obstetrics recalled the old-fashioned bicycle in which there were two big wheels and a little one which ran behind without anybody noticing. In the last few years obstetrics and gynæcology had advanced so rapidly that it was essential to have a body like the college not only to lead developments but to speak with authority. Medicine was not only a great profession; it was the ideal profession: no other calling offered such opportunities for development and pursuit of the finest ideals. The ideals often met with disappointment in practice, but it had been well said that the joy of an ideal lies in its pursuit.

After touching on the risk of dividing medicine into specialties, which might lead the doctor to overlook the whole of the patient, Sir Hugh spoke of the danger that people in certain departments of medicine should regard themselves as the profession. It was of the greatest importance at this time that the profession should feel itself united and express its voice in such a way as to impress those in authority. Unity must be secured between the colleges themselves and between the colleges and other professional organisations. The work of the colleges was a special academic work, for which they were particularly fitted, but other things could be done only by such a body as the British Medical Association. One could not always be sure that the "will of the people" would bring about the good of the patient. Medicine should speak with one voice on what it believed to be in the best interests of the people as well as of the profession.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE University of Edinburgh is planning a considerable extension of its premises. For many years now the accommodation in the university buildings has been wholly inadequate, and in the period after the war of 1914–18 new departments were built on the south side of the city some distance away from the old university buildings and from the medical school. As a result the university was scattered rather widely over the city with a consequent loss of corporate sense and much inconvenience to all concerned. The present plan has been prepared for the university by Dr. Holden in consultation with Sir Patrick Abercrombie and Mr. Plumstead, the town planning officer for Edinburgh. Principal Sir John Fraser publicly described the plans some weeks ago and emphasised the urgency of beginning to put them into effect. The Edinburgh town council has now expressed its general approval, at least in principle, of the first stage of the development, and Sir John Falconer, the lord provost, has given the scheme for the formation of a university precinct his blessing.

It is intended that almost the whole area between the present old university buildings in the South Bridge at one end, and George Square and the Meadows at the other, should become a university area without interfering with the principal traffic routes which pass through this part of the city. The plan foresees the construction of teaching buildings on all sides of George Square with university hostel accommodation in Buccleuch Place and its neighbourhood. It is intended to develop the medical school by extending its buildings from the present New Quadrangle in Teviot Place backwards to include the north side of George Square. This will mean a great increase in accommodation for the various departments of the medical school. It is understood that the new building programme will not involve the abandonment of the buildings at West Mains Road, which are mainly occupied by departments of the faculty of science, but the arts and other faculties still accommodated in the old university buildings in South Bridge have been in a hopelessly cramped situation, and the provision of additional and better premises for these faculties is an urgent matter.

Public Health

Prospects in Industrial Medicine

A CONFERENCE held at Leeds last summer[1] reviewed the difficulty of giving medical care to people working in small factories—some 53% of the whole industrial population. Accidents and disease are commoner in these small factories, as Dr. C. G. Kirkland pointed out. He suggested that a mobile corps might be formed for factories, to take the doctor to the job. Dr. J. Vaughan Jones thought the care of people in these smaller factories could not be left to voluntary effort. In one or two places—at Bedford, and at Cray in Essex—small firms have grouped themselves together to provide medical care for workers, but such schemes he believes are not likely to become widespread: the interests of small firms are too diverse. He upheld the view of the Leeds joint council that industrial medicine should be a statutory service, regionally planned. The statutory principle was supported by nearly all the speakers. Many doctors felt that because they were paid by the firm they were at a disadvantage with workers, who suspected them of being "gaffer's" men, more interested in production than in the health of the producers.

Discussing the organisation of a statutory service, Dr. G. F. Keatinge said it would not do to put the responsibility of medical supervision on the existing examining surgeons, because they can only give a limited amount of time to the work; besides, their approach is personal instead of being environmental and occupational. He thought that a corps of specialists in industrial medicine should be formed, to be called occupational health officers. They would be the next link in the chain after the school medical officer, supervising conditions for the worker from his entry to industry to the end of his working life.

Many speakers noted that while the industrial medical officer can recommend alterations in working conditions, he has at present no authority to demand them. As a State servant he would be able to insist that workshops were maintained at the statutory level; though, as Dr N. J. Cochran remarked, this might limit him, too: an intelligent doctor employed by the firm could suggest improvements beyond the statutory level.

It was generally agreed that industrial health research falls short in scope, speed, and operation.

The General Register Office

The branches of the office which were evacuated to Blackpool at the beginning of the war have now returned to Somerset House, London. The Registrar-General and a small staff remained at Somerset House throughout the war, but the general work of the office has been carried out at Blackpool. The records of births, deaths, and marriages were arranged and indexed there and then sent to Somerset House to be kept in the vaults. The whole of the office is now housed in London, except a part of the statistical branch and the whole of the Central National Registration Office which remain at Southport.

Infectious Disease in England and Wales

WEEK ENDED SEPT. 21

Notifications.—Smallpox, 0; scarlet fever, 853; whooping-cough, 1610; diphtheria, 240; paratyphoid, 17; typhoid, 13; measles (excluding rubella), 1208; pneumonia (primary or influenzal), 312; cerebrospinal fever, 36; poliomyelitis, 28; polio-encephalitis, 3; encephalitis lethargica, 1; dysentery, 66; puerperal pyrexia, 106; ophthalmia neonatorum, 69. No case of cholera, plague, or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (1) from an enteric fever, 1 (0) from measles, 6 (0) from whooping-cough, 3 (2) from diphtheria, 38 (3) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 266 (corresponding to a rate of 30 per thousand total births), including 41 in London.

---

[1] Industrial Medicine. Report of Conference held in Leeds on June 20, 1946, by the Leeds Joint Council on Industrial Medicine, the Burton-on-Trent Advisory Council on Industrial Medicine, and the Derby Advisory Council on Industrial Health.

In England Now

A Running Commentary by Peripatetic Correspondents

THE "squatters" have only recently burst on astonished newspaper readers. But the game is not new, as several hospitals can testify. One hospital urgently needed a large house and actively tried to obtain it. But the process of purchase and derequisitioning takes an amazingly long time and the house stood empty for months. So the homeless understandably assumed that since the war-time residents had long since gone, no-one was coming in; so in they went. How to get them out is another matter, but if the "usual channels" in Whitehall had not been so long, twisting, and clogged the trouble would never have arisen.

Another hospital, warned of its friend's dilemma and being itself endowed with the experience of many centuries, bought a house, and, since on the day it was derequisitioned the keys were not forthcoming, it applied padlocks to the outside of all the doors just to make sure. Thereafter it could set applications for licences in motion in a fairly secure frame of mind, and in the hope that its bombed-out nurses might some day find a resting place. But alas, that was too easy. The applications having gone the rounds for some two months and no answer having arrived, the premises had to remain unoccupied, and a new requisition order was issued by a different authority. And so the battle for derequisitioning started all over again. Meanwhile the nurses are thinking of doing a bit of squatting on their own account.

* * *

It was balm to me, as one of that ignorant class who learn most of their nutritional theory and practice from the daily press, to read in my evening paper the suave statement that "the reduction in the extraction-rate, nevertheless, will mean that bread will have a greater nutritional value, as the 5 per cent. reduction is equivalent to that amount less bran going into the bread." And, having read it, I was immediately in an awful state of mental conflict. Did not this contradict the assurances, so smoothly proffered, that previous increases were all *for the good* of our health and "nutrition"? Had I not read not so long ago an opinion of one of the Highest, that the (then) darker loaf was to contain more and more of five specified things and of a sixth class "some of them possibly not yet discovered"?

Well, I took the trouble to look it up, and I *had* read it all. I now suspect that these dizzy changes in our extraction-rate are but one voice in an elaborate counterpoint, grandly interpreted by the Public Relations Officer virtuoso on an instrument composed of "our medical and scientific advisers." I was pained to find how often I had meekly made a virtue of a necessity, gobbled up temporary surpluses, and skated round less temporary shortages. Of course I do not know whether the statement which set me inquiring was, or was not, part of an official hand-out. Perhaps it came from the Opposition. I hope it did; otherwise I could only say to the official spokesmen "Bah! Eat your words—they're so nutritious."

* * *

This complex modern life has given rise to an ever-increasing number of occupational diseases, and the participants in such a characteristically civilised activity as a world war have added their quota of martyrs to the inventive genius of mankind. For example, that vehicle of death, the jeep, has so often traumatised the posteriors of its hardy occupants and caused inflammation to arise in previously unsuspected pilonidal sinuses that the American Army Medical Corps has dubbed this complaint jeep disease.

But places and circumstances as well as machines have their own particular hazards. I well remember a winter spent in a much-bombed Italian market town, where there was, for some reason, a great dearth of manhole covers. This, combined with the black-out and a certain partiality for indulgence in the local "vino" on the part of our troops, made me familiar with a syndrome characteristic of the place. The essential features were a laceration of one supra-orbital region, occurring late at night in a somewhat alcoholic member of the Armed Forces. There was sometimes a concomitant abrasion of the shin, but this was usually trivial. Cases of this syndrome were seen at the rate of one a night on an average, and I was more annoyed than surprised when I was summoned from bed one winter night to yet another case. He appeared quite typical at first, except that the degree of alcoholisation was rather more profound than usual, and some difficulty was experienced in getting him to the theatre under his own steam. I was in the middle of my surgical procedure, conducted under local anæsthesia, when the patient announced with a great wail of distress that he had gone blind. I was taken aback by this and cursed myself for allowing my somnolence to make me omit even a cursory examination of the central nervous system; there had recently been a few cases of blindness among American troops in the neighbourhood who had drunk wine fortified by the natives of the place with methyl alcohol. Telling the patient not to worry I hastily completed my operation and proceeded to a more detailed examination. On inspection of the eyes it appeared to my relief that the cause of his ocular symptoms had been merely an alcoholic inability to open the eyes voluntarily. "Thank God, doctor," said the patient, with a cry of relief at his deliverance, "I can see quite all right now. You know, doctor," he added, "you're the most beautiful sight I've seen for ages." Even my wife hardly ever says that to me. But then she hardly ever touches alcohol.

* * *

In medieval times the view that disease in general, and plague and pestilence in particular, was a punishment for sin, was deep-rooted in the minds of men; and the gradual elimination of this vigorous superstition has been achieved slowly with the advance of medical knowledge and better understanding of the nature of disease. Through the accidental circumstances of their usual method of transmission, the venereal diseases, and these alone, still incur the judgment and condemnation of the stern moralist. Perhaps it is to the religious convictions of our forefathers, therefore, that part of the abnormal response to fear of these conditions must be attributed. The effects are variable and depend largely on mental balance and stability, but the apparently normal are not without their idiosyncrasies.

In better times, at this season of the year, it has been customary for our clinic to be invaded by workmen who render us acutely uncomfortable for a time, but leave us neat and shining with a coat of glossy paint. Sometimes they have expressed fears of contagion, but the rough and ready reassurance of our permanent staff has sufficed to calm these fears. This year we had to be content with a washdown of the walls and distemper on the ceilings. This year, too, the consternation of the workmen was exceptionally violent, and our technique of reassurance, spiced with ripe comment, failed to satisfy. The workmen were off their food, and the foreman's wife sternly forbade him the solace of the connubial bed until the danger was past. It was a bitter pill to us that we could not reassure them, and that our own year-long heroic defiance of the danger went for naught. Yet it had its advantages. It is long since men were seen to work so hard. The spirit and devotion of Dunkirk and D-day were born again, and wonders were wrought with almost incredible rapidity. It is hard to believe that sympathy with the foreman's predicament was the compelling factor, and the result must be attributed to a desire to restrict the period of danger. We are prepared, at a fee of course, to give advice to working parties on the proper application of the spirochætal spur and the gonococcal goad.

* * *

How quickly does fame depart! A recent examination of candidates for a postgraduate diploma in child health produced *the favourite* chronic arthritis child who is always a good topic for cross-examination—of the candidate. The usual gambit led up to the name of Still. The usual question as *to* who Still was produced the unexpected answer that he was an American. Lend-lease is all very well but this is going too far. It conjured up visions of George Frederic having *an academic* discussion with Andrew (somewhere in the shades) on the use of chiropraxis in the treatment of chronic arthritis in childhood. However, medical history is not a compulsory *subject*, so this candidate fared better than the one who remarked "If the W.R. excludes G.C., it's O.K."—surely the maximum of error combined with the maximum of irritation.

Letters to the Editor

MILITARY SERVICE FOR MEDICAL STUDENTS

SIR,—Your leader of Sept. 21 discusses alternative ways in which medical students may meet their obligation of military service. As you point out, the more useful and more convenient—namely, to serve after qualifying —will be impracticable for the next two years or so. May I then suggest another possibility which I believe would meet the present situation as well as future requirements ?

Why not split up the whole term of military service for medical students into two independent periods ? The prospective doctor could serve the first half of his term conveniently between school and university, thereby filling at least part of the interval that will elapse before he finds his place at a medical school. During this time he would have a general ordinary military training with the rank and file, though of course not a complete technical training in any of the specialised weapons and highly mechanised military craft which he does not require. Later, after qualification, he would complete his term of military service as a junior Service medical officer. This scheme proved its merits in Imperial Germany before, and with appropriate modifications during, the first world war.

Such a system would not only provide all the advantages and opportunities of the second alternative outlined in your leader but would also have some additional effects beneficial both to the doctor and to the fighting men under his care. (1) The medical student need not sacrifice too much of his precious time to purely military training but still has all the benefit a healthy young man can derive from military life. (2) During his shortened military training he acquires an intimate first-hand knowledge of the sort of job the soldier (or sailor or airman) has got to do. (3) If, as he should, he serves with the rank and file instead of with a selected group he gets to know something of the mentality of the ordinary man. This will stand him in good stead in civilian as well as military practice. (4) Last, but not least, he sees some of the methods and tricks used by comrades to evade duty. This knowledge will help him considerably as a doctor in assessing his patients' complaints.

Wolsingham, Co. Durham. E. G. W. HOFFSTAEDT.

A SYNDROME SIMULATING ACUTE ABDOMINAL DISEASE

SIR,—The letters following our paper of August 24 have suggested two possible explanations of the group of cases that we described—infective hepatitis and Bornholm disease.

Dr. Oram suggests that subicteric forms of infective hepatitis could have caused the syndrome. We agree that acute abdominal symptoms, rarely simulating surgical emergencies, may usher in the early stages. But at the time our wards contained many cases of obvious infective hepatitis, not one of which showed the syndrome described. It seems unlikely that subicteric cases would show more severe symptoms.

The question of Bornholm disease requires more careful consideration, and we admit that it might well have been included in the differential diagnosis. Neither of us has had experience of this disorder, which from the multiplicity of the symptoms described would appear to include a variety of pathological conditions. We are grateful to Dr. Evans for drawing our attention to Dr. Scadding's excellent article,[1] but our cases differ considerably from his, the symptoms being mostly abdominal while his were mainly thoracic. Pleural rub was absent in all our patients. We rejected an epidemic origin of our cases (perhaps wrongly) because they were unrelated, and because no minor varieties of the same syndrome were seen on the medical side of the hospital, as might have been expected in an epidemic. We are aware that a small percentage of cases of Bornholm disease may simulate abdominal emergencies, but nearly 100% of our cases presented with acute abdominal symptoms. The hypothesis that abortive staphylococcal retroperitoneal infection could be the cause of the syndrome was suggested to us because one of our cases developed a perinephric abscess. Dr. Evans objects to this hypothesis and says that one of his cases had a tuberculous apical abscess "but this does not make the rest tubercular." However, we stressed the perinephric abscess because it was possibly a significant lesion. It was capable of providing an explanation which we put forward quite humbly. At least it may stimulate inquiry, and should it be correct it will have rescued a series of cases from the dumping ground of varied conditions called Bornholm disease. Incidentally we wonder if Dr. Evans has noticed a letter from Dr. Cayley[2] on "The apparently acute abdomen in pulmonary tuberculosis."

B. W. GOLDSTONE,
Reading. H. S. LE MARQUAND.

MYTH AND MUMPSIMUS

SIR,—I regret that Dr. Forbes in his mention of lumber that should be thrown on the rubbish-heap did not include our antiquated Imperial system of weights and measures. I can recall the expectation fifty years ago that in the next *British Pharmacopœia* the metric system would be in sole use. What is the explanation of the retention of the older system ? Is it a wise *caution*, or is it just pure thrawnness ? It is not a mere question of nomenclature. A scientific system like the metric would tend to create a scientific outlook in its users.

Knock, Belfast. R. M. FRASER.

TUBERCULOUS ENDOMETRITIS AND STERILITY

SIR,—Your annotation of Sept. 7 says:

(1) "The association between sterility and tuberculous endometritis has been recognised only in the last few years. . . ."

(2) "His [Halbrecht's] conclusion that occult, subclinical tuberculous endometritis is one of the cardinal causes of sterility in general and of tubal occlusion in particular may have come as something of a shock to English workers. . . ."

(3) "It will be interesting to see whether, with further experience, similar reports appear in this country."

These statements require correction, not only in the interests of scientific accuracy but also because of the implication that the knowledge, to say nothing of original research, was new to "English workers." Only a few of the main facts can be dealt with here, but we should like to present a more accurate picture of the present-day knowledge of the relationship between tuberculous endometritis and sterility. A detailed account is, in fact, at present in the press, forming a portion of a paper being read by one of us (Sharman) at the Congress of the South African Medical Association this month. A study is made of 94 cases of tuberculous endometritis in a consecutive series of 1712 cases of primary sterility (5·5%) —this is the largest series ever recorded.

In 1943 one of us (Sutherland [1]), in a paper on Unsuspected Tuberculosis of the Endometrium, discussed at length the clinical aspects and pathology of the condition: the literature was fully reviewed. It was pointed out that the high incidence of sterility in endometrial tuberculosis was striking and that this causal factor had been stressed by Steinsick (1922),[2] Daniel (1925),[3] Halban and Seitz (1926),[4] and Vogt (1928).[5] The incidence was given as 7·2% in 212 patients (Steinsick), 7·0% in 71 patients (Schockaert and Ferin[6]), and 5·1% in 390 patients (Sharman). No relevant reference was found prior to 1922, not even in the excellent and exhaustive monograph by Norris in 1921.[7] In 1943 one of us (Sharman [8]) reported to the Royal Society of edicine a series of 840 cases of primary sterility, of hich 42 (5%) showed endometrial tuberculosis.

---

[1] Scadding, J. G. *Lancet*, 1946, i, 763.

[2] Cayley, F. E. de W. *Brit. med. J.* Sept. 14, p. 403.

[1] Sutherland, A. M. *J. Obstet. Gynæc.* 1943, 50, 161.
[2] Steinsick. Diss. Tübingen, 1922, *quoted by* Vogt (ref. 5).
[3] Daniel, C. *Gynec. et Obstet.* 1925, 11, 161.
[4] Halban, J., Seitz., L. Biologie und Pathologie des Weibes, 1926, vol. v, p. 367.
[5] Vogt, E. *Z. Tuberk.* 1928, 51, 114.
[6] Schockaert, J. A., Ferin, J. *Bull. Soc. roy belge Gynéc. Obstét.* 1939, 15, 407.
[7] Norris, C. C. Gynecological and Obstetrical Tuberculosis, New York, 1921.
[8] Sharman, A. *Proc. R. Soc. Med.* 1943, 37, 67; *J. Obstet. Gynæc.* 1944, 51, 85.

One of us (Sutherland[1]) has pointed out that it is irly easy to understand why this high incidence of ndometrial tuberculosis in cases of sterility has not een more generally recognised.

(*a*) Routine histological examination of the endometrium as often omitted in the past, but in recent years has been rried out more generally in order to obtain evidence of vulation.

(*b*) The isolated and infrequent lesions of one type of endo- etrial tuberculosis are easily overlooked as they are small nd scanty. With increasing experience one's visual acuity or the lesions is correspondingly increased, but in many ases they are found only after diligent search.

(*c*) Even when the lesions are seen, their tuberculous nature s often not obvious to the observer with an inadequate ackground of general pathology.

(*d*) It is possible that the increasing incidence of tuber- ulosis in general may also apply to tuberculosis of the ndometrium.

The prognosis in the subclinical type is good from the point of view of the patient's general health: systemic extension is uncommon. But the fertility prognosis is well-nigh hopeless. not one of our 64 cases, followed up for more than a year, having become pregnant. This is not entirely due to tubal occlusion caused by tubal tuberculosis, since, although every case of endometrial infection has an associated tubal one, complete occlusion has been found only in 62% of cases of endometrial tuberculosis.

A large amount of work on this interesting subject may be synopsised as follows: (1) careful study of endometrium in cases of primary sterility will show unsuspected endometrial tuberculosis in a minimum of 5·5% of cases: and (2) tubal occlusion, in the absence of palpable adnexal swellings, is due to tubal tuberculosis in a large proportion of cases.

Royal Samaritan Hospital
for Women, Glasgow.

ALBERT SHARMAN.
ARTHUR M. SUTHERLAND.

NEW WORDS ABOUT OLD AGE

SIR,—Dr. Vertue is perfectly correct when he states that there is no word *geria* in Greek. But there is a word *geras*, the common word for old age, the stem being *ger(a)*, the root being *g(e)r*, from which comes also *graus*, an old woman. The *-ia-* in the middle of the word belongs, of course, to the second part of it, not to *ger*—as indeed Dr. Vertue recognises in forming "gerontiatrics." Why the newly named science should be exclusively applied to men is not clear: after all, old women preponderate. *Geron* never means "an old person," always "old man," "elder," "senator": so it would be as logical to use *graus* for the word and talk of "griatrics." However, for the sake of euphony and neatness, "geriatrics" is preferable: it is justified by derivation, and is indeed the only word properly to be applied (the sole alternative being the harsh "geroiatrics").

Edinburgh.

GORDON IRVINE.

PENICILLIN IN WOUND EXUDATES

SIR,—The results of the brilliant piece of research by Lady Florey and her colleagues (Sept. 21, p. 405) will no doubt stimulate other workers to produce the ideal medium for prolonged local application to wounds. That this has exercised the minds of military surgeons for some time can be gleaned by the perusal of the 21 Army Group publication, *Penicillin Therapy and Control*. One extract on pp. 114–115 reads:

> "Deep Wounds with or without bone involvement.—Plugs should not be used, as during a battle when hurried evacuations occur the plug may not be removed for several days. Then granulations grow into the meshes and removal is difficult, and this is still more likely to happen in open fractures if the jagged bone ends become entangled. It is suggested plugs of penicillin wax might be used by those who feel they are indicated. These would cancel themselves out in transit and supply a prolonged local application of penicillin."

B.L.A. SURGEON.

ARSENICAL CHICKENPOX

SIR,—I can add another case to those described by Dr. Parkes Weber (Sept. 14) in which a patient who suffered from herpes zoster while having arsenical treatment apparently infected a child with varicella.

In 1932 a patient in hospital suffering from tabes dorsalis had two or three injections of neoarsphenamine and then developed herpes zoster of the ophthalmic division of the right trigeminal nerve. About a fortnight later another patient in the same ward developed a zoster eruption involving two or three dorsal segments, and a boy, aged ten years, developed a mild attack of chickenpox. The boy, who had an internal hydrocephalus, died a few days later, and at necropsy was found to have a congenital septum of the aqueduct of Sylvius. It may be contended that the arsenical treatment and the attack of herpes zoster in the first patient were not related, but it is by the accumulation of such happenings that it may be possible to establish a more precise relationship between arsenical treatment, herpes zoster, and varicella.

Harrogate.

T. G. REAH.

DESOXYCORTONE AND ARTHRITIS

SIR,—Dr. Harrison has drawn my attention to Dr. Jennings's letter in your issue of Sept. 7. Despite Dr. Harrison's generous acknowledgment of my help (August 10, p. 215), my advice before the publication of his paper of June 1 (p. 815) was limited to explaining how to apply the chi-squared test to the facts as presented in table I of that article. The figures given in that table do not alone provide sufficient evidence to establish the hypothesis that adrenalectomy and thyroidectomy increase the rat's prospects of developing arthritis. I advised Dr. Harrison in this sense in September, 1945.

Dr. Harrison next consulted me in August, 1946. He sought advice in replying to Dr. Jennings's letter in the *Lancet* of July 20, in which Dr. Jennings suggested that there were fallacies in the statistical technique which Dr. Harrison had applied to the facts as presented in his table I. With my help, Dr. Harrison replied to these suggestions in his letter of August 10.

Dr. Jennings's remarks of Sept. 7 are therefore inappropriate. In this case, the "expert behind the scenes" neither "bullied" nor "threatened with specialised profundities." but gave advice on the interpretation of the facts as given in table I. He did not "really collaborate" because he was not invited to do so: he first heard of Dr. Harrison's paper in the *Lancet* after it had been published.

Dr. Jennings may argue that Dr. Harrison should have asked a statistical expert to go through both his paper and that of Professor Selye line by line with him, before he appeared in print: but he surely would not wish the expert to "bully" Dr. Harrison into doing this. I agree with Dr. Jennings that scientists would profit by asking fuller collaboration from statistical experts in the experimental as well as the statistical aspects of their work. Such collaboration is being developed at Oxford, and the understanding, now gradually growing, between scientists and statisticians will no doubt be advanced by Dr. Jennings's Pickwickian and (if I may return his compliment) Jabberwockian correspondence.

Dr. Jennings asserts that Dr. Harrison was claiming "statistical proof of his rightness." Actually, Dr. Harrison merely claimed that the facts as stated in his table I were not sufficient in themselves to establish Selye's hypothesis: he did not claim that they proved Selye's hypothesis wrong. Dr. Jennings points out that Professor Selye quoted evidence additional to that given in table I, and that, when this evidence is taken into account as well, he can disprove Dr. Harrison's hypothesis and establish that of Professor Selye. In particular, Dr. Jennings refers to information about rats which died during the experiment. This may be a point of substance, but as Dr. Jennings has not provided the details of his statistical proof it is not possible to pass judgment on its validity.

In a controversy of this kind, the statistician's aim should be to assist in a correct interpretation of the evidence. If Dr. Jennings and Dr. Harrison would produce a precise formulation of the evidence, stating in particular which of the dead rats had developed arthritis, and if Dr. Jennings then set out his proof from that evidence that Dr. Harrison's hypothesis about rats was wrong and Professor Selye's hypothesis was correct, then the statistical experts should be able to pass impartial judgment supporting (or discrediting) his proof.

I heartily endorse Dr. Jennings's plea that medicine should keep in touch with statistics and vice versa: although since the statistician should also cover biology, astronomy, agriculture, psychology, economics, and the other social sciences, he must confine himself to their statistical aspects.

Institute of Statistics,
University of Oxford.
D. G. CHAMPERNOWNE.

TUBERCULOUS ABSCESS FOLLOWING INTRAMUSCULAR PENICILLIN

SIR,—In their article of Sept. 14 (p. 379) Mr. Ebrill and Dr. Elek say they were unable to find the source of the infection, though it was probably exogenous. In most penicillin drip set-ups there is a weak point that I have often tried to get rectified, but I have always met with the objection that the drip will stop flowing if my advice is followed. The weak point is the air-intake, which should be guarded with a cotton-wool filter to exclude organisms; without the filter a pint of solution is gradually replaced by a pint of bacteria-laden air from the ward. I do not suggest that a filter was omitted on this occasion; what often happens is that someone removes the cotton-wool from the filter for "practical" reasons.

Tubercle bacilli are not uncommon in the dust of hospital wards. It is not surprising that abscesses form at the site of injection; the surprising thing—a testimonial to the vis medicatrix naturæ—is that there are so few of them.

Epping, Essex.
FRANK MARSH.

DEATH AFTER CURARE

SIR,—In your annotation of Sept. 21 you report that the pathologist considered that the death of a patient after an operation was due to toxæmia and had been accelerated by respiratory failure due to curare. The effect of curare wears off rapidly and I do not believe that it causes respiratory depression 43 minutes after administration. The patient was 70 years of age and the anæsthetic used was 'Pentothal.' It is my experience that a high proportion of elderly patients tolerate intravenous barbiturates extremely badly and that delayed recovery after intravenous anæsthesia is common among patients of any age. I know of two elderly men who never recovered consciousness after being given this anæsthetic for the performance of emergency suprapubic cystotomy. We have all seen the young healthy adult who took a very long time to wake up.

Pentothal is a drug which should be used with the greatest caution, and it is unfortunate that so many practitioners have been encouraged to administer an intravenous anæsthetic when some inhalation technique could be used. In this country we are too ready to publish our successes and too reluctant to report our fatalities. If one studies the American journals one can obtain a more accurate appreciation of the dangers of "modern anæsthesia," which I do not find to be as safe or satisfactory as ether. As Flagg rightly says, "Far too many anæsthetists have tried too often to avoid the use of ether anæsthesia, and the skill with which it might be used is not so much in evidence today as it might be." If our medical students and newly qualified practitioners were taught to understand the value and wide range of usefulness of ether we should read of far fewer deaths under anæsthesia being inquired into by the coroners' courts.

All that is modern and new is not progressive, and we might well ponder on the fact that when ether and chloroform were used almost exclusively in England the number of deaths associated with anæsthesia reported to the coroner in one year was 347, whereas in 1941 it was 835. This in spite of the fact that far greater surgical risks were accepted in those days, and that restorative measures were not very satisfactory. We also no longer see the neglected abdominal emergency, once a common cause of operating-room deaths.

I cannot help feeling that in the case you mention th cause of death was the pentothal rather than the curar Curare may be a highly dangerous drug—we do not y know—but do not let us blame it for the offences o another drug.

New Barnet, Herts.
JOHN ELAM.

SIR,—Your annotation of Sept. 21 on the death of patient following an operation during which curare ha been administered was marred for me by the fact that i did not contain the information, which cannot be to widely spread, that in physostigmine (eserine) or 'Pro tigmin' we have an antidote for curare. 'Coramine or 'Veritol' are of no value for counteracting thi substance. No anæsthetist should administer curar unless he has readily available an injection of eserin (1 mg.) or prostigmin (2·5 mg.).

JAS. D. P. GRAHAM.
Dept. of Materia Medica, Glasgow University.

AMŒBOMA AND CARCINOMA

SIR,—Mr. M. J. Smyth's article of Sept. 14 is of particular value in drawing attention to a subject which is not familiar to those who have been denied the opportunities of tropical practice. From time to time examples of amœboma of the rectum will occur in this country and only careful differential diagnosis will prevent surgical disasters.

Amœboma of the rectum is one of the rarer forms o intestinal amœbiasis, and even in tropical countries n one surgeon is likely to see many examples. It may present as an ulcer or as a papilliferous overgrowth, and in either form may appear indistinguishable from carcinoma. The diagnosis, however, will rarely present much difficulty to those who follow Mr. Smyth's advice —that any tumour of the colon or rectum discovered in a patient who has served in the East should be regarded as amœboma rather than carcinoma until thorough pathological examination has proved otherwise. This should apply to all patients who have at any time been exposed to amœbic dysentery, whether they give a history of dysentery or not, and even if they have been discharged as cured of this disease, so noted for its tendency to relapse.

Repeated examination of the stools and of scrapings from the surface of an amœboma may fail to disclose the *Entamœba histolytica*. On the other hand, as Mr. Smyth reminds us, the presence of the *E. histolytica* does not exclude carcinoma. Fortunately in emetine we have a valuable aid to diagnosis. Whether *E. histolytica* has been found or not, before resorting to operation a course of this drug should be given, its effect being checked by repeated sigmoidoscopy. As a general rule the amœboma very rapidly responds, but only a complete resolution can be accepted as proof that the lesion is amœbic. If this is not obtained biopsy must be done.

During four years' military service in endemic areas, I saw six examples of amœboma of the rectum which simulated carcinoma. Five of these resolved completely on medical treatment alone. The sixth patient was admitted as an advanced case of carcinoma of the rectum, and the clinical condition was consistent with this diagnosis. When repeated examination of the stools and of the discharge from the surface of the tumour proved negative, colostomy was proposed; but a proctoscopic examination made on the operation table produced a specimen containing many typical *E. histolytica* and operation was therefore postponed. Emetine was given but the patient died within a few days. Post-mortem examination revealed how futile a colostomy would have proved, for the whole length of the colon was involved in a diffuse amœbic ulceration. These cases are reported in *Surgery, Gynecology and Obstetrics* (1945, 81, 387) and the *Liverpool Medico-chirurgical Journal* (in the press).

It would be unfortunate if Mr. Smyth's statement "I have no doubt that in amœboma of the rectum colostomy is helpful rather than otherwise" were to encourage the frequent performance of this operation. Whereas in the vast majority of cases of rectal amœboma medical measures result in a rapid and complete disappearance of the lesion, colostomy exposes the patient the risk of spreading amœbic infection of the wound d to serious hepatic complications. In rectal amœbiasis fection of the cæcum and proximal colon must be sumed even in the absence of clinical signs, and testinal obstruction of a type which requires a colosmy so urgently that emetine cannot first be given a ial must be very uncommon. Colostomy may of course needed in the rare event of failure to respond to nœbicides, or when dealing with complications such as tractable fistula.

Liverpool. PHILIP HAWE.

SIGN OF SUBMERGED GOITRE

SIR,—There is a useful sign given by a submerged or trathoracic goitre which I have employed and taught r many years. It consists in getting the patient to evate both arms until they touch the sides of the head; ter a moment or so, congestion of the face, some anosis, and lastly distress become apparent—presumoly from narrowing of the thoracic inlet and obstruction the venous return. I have not seen it in superior ediastinal block.

Doubtless the sign has been described before and even ears a name, but I am unaware of it.

Liverpool. H. S. PEMBERTON.

HOSPITAL PHOTOGRAPHIC DEPARTMENT

SIR,—To your issue of August 31 Dr. Hansell and r. Stanford contribute most interesting articles on edical photography. Both see the necessity of adequate pparatus and premises, but their ideas on personnel specially Dr. Stanford's) seem extremely wasteful. hy should a request for a photograph be so vague as need a qualified medical man to interpret it? Surely ose who request are the ones to be taught to know hat they want and to appreciate its uses.

How often are photographs praised merely for their etail without regard to whether they show off the ondition; or requests made at absurdly short notice r theatre work, showing only too clearly the general norance of the hospital of how to get the best out of s photographic department.

The time has come when medical photography should a subject in our medical schools, clinical photography eing on an equality with radiology. Then we will not eed to waste doctors by putting them in photographic epartments as elaborate buffers to the ignorance of eir brothers on the staff. A photographer with really ide experience is essential, and once he or she has a ertain amount of medical knowledge, the doctor who as "joined his hobby to his profession" becomes an xtravagant and unwanted figurehead.

No photographer, if he is wisely chosen, needs a nurse's aining to treat his patients with kindness and conderation.

SYLVIA TREADGOLD
Photographer-in-charge.
Photographic Dept., Guy's Hospital, London, S.E.1.

CHRISTIAN SCIENCE

SIR,—The Chadwick lecture published in your issue f Sept. 21 (p. 427) contains a reference to Christian cience which I should like to correct.

Christian Scientists do not regard disease or other ills merely imaginary. Christian Science teaches that ckness and disease, and other ills, are phases of the elief in an existence apart from God. It further teaches at these evils can be overcome, not by ignoring them, ut by correcting them intelligently by means of a right nderstanding of God and man and their relationship one another.

This question is fully developed in the Christian cience textbook, *Science and Health with Key to the riptures*, by Mary Baker Eddy, the Discoverer and ounder of Christian Science, and on p. 460 the attitude Christian Science to "the ills of the flesh" is briefly ated as follows: "Sickness is neither imaginary nor nreal,—that is, to the frightened, false sense of the atient. Sickness is more than fancy: it is solid convicon. It is therefore to be dealt with through right oprehension of the truth of being."

COLIN R. ÆDDISON.

Christian Science Committee on Publication,
Donington House, Norfolk Street, London, W.C.2.

Obituary

THOMAS WATTS EDEN

M.D. EDIN., F.R.C.P., F.R.C.O.G.

Dr. Watts Eden, who died at Torbay on Sept. 22, was consulting obstetric physician to Charing Cross Hospital, and consulting surgeon to Queen Charlotte's Hospital and the Chelsea Hospital for Women. A former editor of the *Journal of Obstetrics and Gynæcology of the British Empire*, he continued his association with the journal as chairman of the editorial committee and the board of directors.

Born in 1863, the son of Alfred Thomas Eden, of Evesham, he was educated privately and at the University of Edinburgh, where he graduated M.B. in 1888. Of his student days Sir Ewen Maclean writes: "I first met Watts Eden in connexion with the Drummond movement, which was inspired by the simple religious addresses given by Prof. Henry Drummond to his students in Glasgow. In this as in many other directions when effective speaking was required Eden's superb diction and delivery were in great demand. Though he was a year in front of me in the Edinburgh curriculum we contrived to room together, and I could not but envy as well as admire the apparent ease with which he assimilated notes and relevant parts of textbooks, gained medals galore, graduated with first-class honours, and was awarded the much-coveted Ettles scholarship. But despite his brilliant achievements and ability there was no aloofness about him, and in Edinburgh as later in London he made many warm friends."

(Press Portrait Bureau

After postgraduate years spent in Berlin, Leipzig, and Birmingham, Watts Eden came to London and joined the staff of the Chelsea Women's Hospital, where his colleagues included Fairbairn, Comyns Berkeley, and Victor Bonney. "I became acquainted with him," writes Mr. Bonney, "in 1898 when I went to Chelsea Hospital for Women as resident surgical officer. He had been attached to that institution, in a minor capacity, for a short time before the debacle which led to its reorganisation in 1894, and when the new staff was formed he was appointed assistant physician, a title subsequently changed to surgeon. He had already made a name for himself by a paper on the structure of the placenta which attracted much attention, and I remember him as a sparely made young man, somewhat sallow of complexion, with a kindly smile and a deliberate, though incisive, manner of speech.

"He formed one of that small band of surgeons, now alas all departed but one, who, by their devoted and earnest work, raised the reputation of the hospital from the zero to which it had fallen to the highest level of professional estimation, and with them he played a great part in putting abdominopelvic surgery on a sure foundation.

"His own reputation steadily grew. He became a member of the staff of Queen Charlotte's Hospital, and by the time that I went there as a resident officer he and William Gow stood head and shoulders above the rest of their colleagues."

In 1898 he was appointed to the staff of Charing Cross Hospital, where his gifts of clear thinking, writing, and expression quickly won him recognition as a great teacher. To this period belong his manuals of midwifery and obstetrics which have run into many editions, and later in collaboration with Dr. Lockyer he published *Gynæcology for Students and Practitioners*. Outside his own hospital he found time to examine for the universities of Oxford, Cambridge, Edinburgh, and Leeds, to serve on the council of the Royal College of Physicians of London, and to sit on the governing body of the British Postgraduate Medical School. During the first world war he held the rank of major in the R.A.M.C., and our portrait shows him at this period. In 1930 he was elected president of the Royal Society of Medicine and his American colleagues made him an honorary member of the American Gynecological Society. He interpreted the responsibilities of his specialty widely, and in his Lloyd Roberts lecture at St. Mary's Hospital, Manchester, in 1925, and in an address to the Oxford Medical Society in 1931, he put the case for the unborn child, urging his colleagues to beware of regarding the infant as the by-product of the confinement.

A member of the joint council of midwifery appointed by the National Birthday Trust, he was chairman of the committee which in 1935 presented a scheme for an organised national midwifery service designed to raise the status of the midwife, and even after his retirement he continued to take an active interest in the Midwives Guild of St. Breca. "It was my good fortune," writes Dr. Cuthbert Lockyer, "to be Dr. Eden's junior colleague at Charing Cross for many years, and during that time I learned to esteem and respect him. Although never robust, his industry was remarkable and even in retirement at Thurlestone he gave unselfishly of his strength in the promotion of the welfare of the Royal College of Obstetricians and Gynæcologists, of which he had been an active and influential founder. With his many interests he would spend whole weeks in London attending as many as 15–20 committee meetings before returning spent to his country home. Our coöperation in clinical work was uniformly harmonious, our collaboration in writing was a labour of love, and our friendship has been up to the last close and intimate."

In Mr. Bonney's words, "A long life filled with honourable work has come to an end, and viewing it as a whole certain great qualities of the man stand out clearly: a steady level-headedness, a wide humanity, an unassailable integrity, and a great dignity. These are the things which, beyond all else, procured him the respect and affection of those who worked with him, and the specialty, which he made it his life's work to serve, grieves at his passing, for he kept its flag flying very high."

In 1900 Dr. Eden married Miss May Bain, of Cockermouth, who survives him.

FRANK McCALLUM

M.B. MELB., D.P.H., D.T.M. & H.

THE death is announced of Dr. Frank McCallum, who just over a year ago was appointed director-general of health for the Commonwealth of Australia. Son of the late Rev. Alexander McCallum, D.D., of Melbourne, he was educated at Wesley College and Melbourne University. At the outbreak of war in 1914 he joined the A.A.M.C. at once, only interrupting his service to graduate M.B. in 1917. After holding a house-appointment at Cardiff Royal Infirmary, he returned to Australia in 1920 to take his D.P.H. at Melbourne and to join the Commonwealth quarantine service. During 1922 and 1923, with a Rockefeller travelling fellowship, he visited the United States and returned to this country to take his D.T.M. & H. In 1927 he was appointed director of the division of epidemiology of the Commonwealth department of health, and two years later became chief medical officer at Australia House in London. During this period he represented Australia on the permanent committee of the Office International d'Hygiène publique. In 1934 he became chief quarantine officer of the North Eastern division and in the same year senior medical officer of the administrative staff at the health department at Canberra. Dr. McCallum was 56 years of age.

N. M. G. writes: "McCallum was chiefly known in this country for his interest in international health work. While chief medical officer in London from 1929 to 1934, and afterwards, he often represented Australia at international public-health meetings and I well remember how greatly the tedium of a return from Paris to London was relieved by his quiet and likeable companionship. His little book—now scarce—on *International Hygiene*, published in 1935 by the department of health of the Commonwealth and based on lectures he gave at Melbourne University, was acknowledged to be the most useful publication in that field. His friends in this country will deplore his untimely death so soon after he had taken over the leading public-health post of his country."

Notes and News

TRAFFIC IN NARCOTIC DRUGS

THE secretariat of the League of Nations at Geneva h lately issued a summary of the annual reports for 1941 fr the countries party to the several opium and narcotic dr conventions (1912–36), with apology for unavoidable del The summary surveys the position of the narcotic dru traffic in the 67 contracting countries. China was said to b complacent at the completion of the "six-year suppress plan," and opium-smoking by overseas Chinese was to b taken in hand, while illicit cultivation and trade in man provinces in Japanese occupation was deplored. In t United Kingdom addiction to narcotic drugs, chiefly morphi was reported to be decreasing. The number of addicts 1941 was 503 (252 men and 251 women) of whom 89 w doctors. In India opium was being illicitly imported fr border countries and Afghanistan, and illicitly export to Burma and Ceylon from Bengal. In Canada there was s some addiction to codeine, and hypodermic injection smoking opium was being practised by occidentals a orientals on the Pacific coast—addicts have been kno to resort to the ointment of galls and opium to obtain morphine content. In Egypt the Central Narcotics Bure reported the continued smuggling of hashish and opi through Syria and Palestine, while the southern Sud was growing illicit hashish and sending it north on riv steamers.

As regards "raw opium" the area under poppy cultivati in India in 1941 was 1950 hectares, the whole of the produ being sold to the government opium factory at Ghazipu the consumption of "excise opium" for "medical, qua medical, and non-medical purposes" in 1941 was 136,822 k Five firms are licensed in the United Kingdom to manufactu narcotic drugs, and a like number in the United Stat From Colombia comes an urgent appeal, supported by t Apostolic Nuncio, for "reducing the cultivation of the co plant to the level of world medical requirements" an its habitual abuse is said to cause widespread ravages tuberculosis.

FOOD BULLETINS

King Edward's Hospital Fund for London circulat bulletins periodically to hospitals in which tested recipes a given to a wider public, current food problems are discusse and inquiries to do with food or catering are answered. T first bulletin, which appeared in May, contained notes o dried milk, and recipes for puddings without fat. The Augu bulletin discussed allowances for expectant and nursi mothers, and gave some recipes for breakfast dishes. A thi bulletin, nearly ready, will deal with the feeding of childre The fund's address is 10, Old Jewry, E.C.2.

MIDWIVES' PROGRESS

RETURNS made to the Central Midwives Board[1] by loc supervising authorities show that the number of midwives wh notified their intention to practise during 1945 was 16,680 some 300 more than in 1944. Of this number only 3 had bee in practice before 1902, when the Midwives Act was passe and only 10% had been enrolled before 1920. Some 78 midwives have been trained and enrolled under the mo recent rules of the Central Midwives Board, which hav operated since May, 1939. More than half of these wom were practising in 1945, and 90% of these were State-register nurses. Probably about 62% of practising midwives ar the peak period of their working lives—between the ages 27 and 47.

A great many women who do not intend to practise midwives take the board's examinations. There are 72, names on the register, and of some 14,000 midwives enrolled the six years 1936–41, only 24% notified their intention practise in 1945. This custom of training an excess of mi wives is not wholly extravagant, for the experience is doubtl useful to nurses who take up public-health work; inde employing authorities are apt to look for this qualificatio But it has the effect of reducing the numbers of cases availa for medical students, and it does not offer the prospecti public-health nurse a course ideally suited to her needs. would be useful to consider whether a more appropri certificate course might not be offered to nurses who do n end to practise as midwives, with less emphasis on delivery d more on the care of infants after the first month. The ard, with the approval of the Ministry of Health, have ended their rules to enable sick children's nurses to be mitted to a shortened period of training, not described in e report; and such a course might serve the purpose of her nurses who do not intend to practise midwifery.

---

[1] Report on the work of the Central Midwives Board for the y ended March 31, 1

In view of the present shortage of practising midwives the ard have decided that the time has not yet come to restore e rules, suspended in 1939, requiring midwives to attend st-certificate refresher courses; but they welcome the luntary schemes for providing such courses which many al authorities are supporting.

ASPHYXIA AND ANOXIA

WRITING in *Science* (1946, 104, 112), Prof. E. J. Van Liere otests against the misuse of the terms asphyxia and anoxia. e contends that during anoxia there is a diminished supply oxygen to the tissues, but there is no accumulation of CO_2 the alveolar air, or presumably in the tissues, because the sociated hyperpnœa washes the CO_2 out of the lungs. In phyxia, on the other hand, diminished oxygenation of the ssues is accompanied by an increase of CO_2 tension in the ood and tissues. He quotes Yandell Henderson's criticism at the term asphyxiated is well established but there is no uivalent term for a condition of anoxia: "Then let us eate one," says Van Liere: "the equivalent would be noxiated'." This term would certainly describe accurately e state of a man who has ascended to such a height that the ygen tension is too low to sustain life.

VITAL STATISTICS FOR JUNE QUARTER

THE Registrar-General's return for the June quarter H.M. Stationery Office, 6*d*.) confirms that the birth-rate as 19·2 per 1000 total population, the highest rate recorded any quarter since June, 1925. The total number of births as 203,797 and the proportion of boys to girls 1069 to 1000. irths exceeded deaths by 89,727, compared with an excess 64,252 for June quarter, 1945. Infant mortality, provisionally corrected, was 41 per 1000 related live births— per 1000 below the average of the previous ten June quarters. he number of illegitimate births was 14,789, this being 625 fewer than in June last year. Deaths numbered 114,070, presenting a death-rate of 10·7 per 1000 compared with [illegible]4 for June quarter, 1945, and an average of 11·6 for the revious five June quarters. Marriages totalled 100,814, n increase of 6620 over the average for the June quarters 941–45.

ART EXHIBITION FOR THE HOSPITALS

King Edward's Hospital Fund for London has organised loan exhibition of pictures from the collection of Sir Harold Vernher, K.C.V.O., at the Wildenstein Gallery, New Bond treet, W.1. The exhibition was opened by the Duchess f Kent on Oct. 2, and will remain open until Nov. 9. The harge for admission is 2*s*. 6*d*., and all proceeds will be given o King Edward's Fund.

---

niversity of Sheffield

At recent examinations the following were successful:

M.D.—H. B. Stoner.

Final M.B., Ch.B. examination.—Michael Redfern (with first-class onours); Derrick Dexter (with second-class honours).

ostgraduate Course at Leeds

A two-weeks' general refresher course for class 2 demobilised edical officers and insurance practitioners is to be held by the niversity of Leeds, commencing on Monday, Nov. 25. nquiries should be directed to the Senior Administrative fficer, School of Medicine, Leeds, 2.

oyal College of Physicians of London

Dr. D. Evan Bedford will deliver the Bradshaw lecture at the college, Pall Mall East, S.W.1, on Thursday, Nov. 7, at 5 P.M. He will speak on Hypertensive Heart Disease.

ociety of Medical Officers of Health

Sir Allen Daley, medical officer of health and school medical fficer, London County Council, will be installed as president this society for the session 1946–47, and will give his presiential address at a meeting to be held at Tavistock House, avistock Square, London, W.C.1, at 5.30 P.M. on Thursday, ct. 17.

British Institute of Philosophy

A course of five lectures on Contemporary World Outlooks will be delivered at 5.15 P.M. on Fridays from Oct. 11 to Nov. 8, at University Hall, 14, Gordon Square, W.C.1.

Central Council for Health Education

The council has lately formed a field work committee, and a materials committee. The chairmen are Dr. A. B. Williamson, M.O.H. for Portsmouth, and Dr. H. Maurice Williams, M.O.H. for Southampton.

Medical Photographic Exhibition

An informal display of medical photographic apparatus and records is to be held in the department of medical photography, Westminster Hospital School of Medicine, from Oct. 8 to 11, between the hours of 10 A.M. and 4 P.M.

West London Medico-Chirurgical Society

A dinner will be held on Friday, Oct. 18, at 7 P.M., at the South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7. Dr. G. S. Hovenden will deliver the presidential address on Fifty Years of General Practice.

Medical Defence Union

At the annual meeting held in London on Sept. 24, Mr. St. J. Buxton was elected president, Dr. Henry Robinson treasurer, and Dr. G. Roche Lynch chairman of the council committee. Dr. Janet Aitken, Mr. Buxton, and Dr. Peter Macdonald were re-elected members of council. The union now has more than 30,000 members, all of whom are registered medical practitioners. The annual report is reviewed on another page.

Local Responsibility for Hospitals

In an address at the annual meeting of the Nelson Hospital, reported in the *Times* of Sept. 28, Sir Alfred Webb-Johnson, P.R.C.S., suggested that in the National Health Service the freedom given to the teaching hospitals should be extended not only to the hospital management committees but also to individual hospitals. Local interest and support would thus be retained, and opportunities for donors, and for funds such as King Edward's Hospital Fund and the Nuffield Trust, would be greatly extended. He hoped that Parliament would allow the largest measure of local responsibility for the planning and conduct of hospitals.

British Orthopædic Association

The association's annual meeting is to be held in London on Friday and Saturday, Oct. 18 and 19; the meeting will be held on the first day at the Royal Society of Medicine, 1, Wimpole Street, W.1, and on the second day at St. Thomas's Hospital, S.E.1. The programme on Oct. 18 begins at 9.30 A.M. with a discussion on Fractures of the Os Calcis, to be opened by Mr. N. W. Roberts and Mr. W. Gissane; this will be followed by Mr. George Perkins's presidential address on Rest versus Activity in the Treatment of a Fracture, and by short papers. There will be a dinner at Grosvenor House Hotel, Park Lane, W.1, at 7 P.M. The annual general meeting will take place at 9.30 A.M. on Oct. 19, and will be followed by a demonstration of cases.

Centenary in Anæsthesia

The section of anæsthetics of the Royal Society of Medicine is to celebrate next month the centenary of the first public administration of an anæsthetic. A reception by Sir Gordon Gordon-Taylor, the society's immediate past-president, will be held on Friday, Nov. 1, at 7.30 P.M. This will be followed by a buffet supper, after which Dr. E. S. Rowbotham, president of the section, will speak on A Hundred Years of Anæsthesia.

The Association of Anæsthetists of Great Britain and Ireland is marking the centenary of the first administration of ether in Great Britain with events on Oct. 30 and 31 and Dec. 21. At 8.30 P.M. on Wednesday, Oct. 30, the Princess Royal will unveil at the Royal College of Surgeons a plaque commemorating four pioneers in anæsthesia; the ceremony will be followed by a reception. On the morning of Thursday, Oct. 31, there will be operating sessions at various London hospitals; the annual general meeting will be held at the Royal College of Surgeons at 2 P.M., and at 7 P.M. there will be a dinner in the Great Hall of Lincoln's Inn. An exhibition of anæsthetic apparatus will be open at the Royal College of Surgeons from Oct. 29 to Nov. 1. On Saturday, Dec. 21, there will be a dinner-dance at the Dorchester Hotel.

Heberden Society

The annual general meeting of this society is to be held on Oct. 25 and 26, at 11, Chandos Street, London, W.1. At 4.45 P.M. on Friday, the 25th, there will be a discussion on Future Trends of Research in Rheumatoid Arthritis, when Dr. G. M. Findlay will speak on Arthritis in Rats and Mice due to Pleuropneumonia-like Organisms, and Dr. D. H. Collins on Erysipelothrix Polyarthritis of Swine. The annual dinner will take place at 7.45 P.M., in the Euston Hotel. On Saturday, the 26th, at 11 A.M., Prof. J. A. Höjer, chief medical officer of the Royal Swedish ministry of health, will read a paper on the Organisation and Work of a Rheumatic Service in Sweden. Further particulars may be had from the general secretary, Miss Bereton, 91, Priory Road, West Hampstead, N.W.6.

Louis Gross Lecture

Dr. Roy R. Grinker, director of the Institute for Psychosomatic and Psychiatric Research and Training of the Michael Reese Hospital, Chicago, will deliver the ninth Louis Gross lecture at the Jewish General Hospital, Montreal, on Wednesday, Oct. 23, at 8.30 P.M. He will speak on Psychiatric Objectives of our Time.

Return to Practice

The Central Medical War Committee announces that the following have resumed civilian practice:

Mr. D. J. MacRae, F.R.C.S., M.R.C.O.G., 10, Harley Street, London, W.1.
Dr. R. J. Twort, 11, Park Terrace, Nottingham (Tel. 66486).

WEAPON AGAINST MIDGES.—In reply to our peripatetic correspondent of Sept. 21, who wondered whether D.M.P. has yet got through to the civilian, Dr. A. R. Neligan writes that it has, in the form of 'Mylol' (Boots), and is proving invaluable against this autumn's clouds of midges.

Messrs. Allen & Hanbury inform us that they now have limited stocks of 'Rutin' available. The use of this drug in the treatment of increased capillary fragility was discussed in our columns on July 6, p. 16.

Births, Marriages, and Deaths

BIRTHS

BORLAND.—On Sept. 23, at Sunbury-on-Thames, the wife of Dr. A. K. Borland—a son.
CATHIE.—On Sept. 24, at Guildford, the wife of Dr. I. A. B. Cathie—a daughter.
CROSS.—On Sept. 21, in London, the wife of Dr. W. George Cross, of Elstree—a son.
FLOWERDEW.—On Sept. 26, the wife of Dr. F. Digby Mackworth Flowerdew—a son.
GOWAR.—On Sept. 24, in London, the wife of Mr. F. Sambrook Gowar, F.R.C.S.—a daughter.
HINDS.—On Sept. 27, in London, the wife of Dr. S. W. Hinds—a son.
JAMISON.—On Sept. 23, in London, the wife of Dr. Howard M. Jamison—a daughter.
KING.—On Sept. 20, at Clifton, Bristol, the wife of Dr. Charles A. King—a son.
LEIGH.—On Sept. 26, in London, the wife of Dr. A. D. Leigh—a son.
MACKENZIE.—On Sept. 21, in Edinburgh, the wife of Mr. Ian MacKenzie, F.R.C.S.E.—a daughter.
OXLEY.—On Sept. 25, in London, the wife of Lieut.-Colonel W. Malcolm Oxley, R.A.M.C.—a son.
SARSON.—On Sept. 24, at Kettering, the wife of Flight-Lieutenant J. M. G. Sarson, M.B.—a daughter.
SYMONS.—On Sept. 20, at Southborough, the wife of Dr. H. McN. Symons—a son.
THORNTON.—On Sept. 21, at Stratford, the wife of Dr. Kenneth Thornton—a son.

MARRIAGES

GORDON—PEEL.—On Sept. 25, at Guildford, Frederick William Gordon, M.D., to Muriel Peel.
HUNT—CLAPHAM.—On Sept. 10, at Henfield, Geoffrey Notley Hunt, M.R.C.S., to Deborah K. R. Clapham.
SLOPER—CHAPPEL.—On Sept. 21, at Bedford, John Chaplin Sloper, M.R.C.P., to Irene Mary Susan Chappel, M.B.

DEATHS

ADAM.—On August 8, William Caldow Adam, L.R.C.P.E., flying-officer R.A.F.V.R., aged 26.
BASKETT.—On Sept. 25, Bertram George Mortimer Baskett, M.B. Oxfd, of London, S.E.26, aged 84.
JENKINS.—On Sept. 25, at Almondsbury, Glos., Robert Donaldson Jenkins, M.B. Brist., surgeon-commander R.N.V.R.
MACLEOD.—On Sept. 21, Neil Macleod, M.D. Edin., of Horsforth and Leeds, aged 52.
MOORE.—In September, presumed lost when sailing, Joseph Hodgson Moore, M.B. Lond., of Swinton, Manchester, aged 44.
MURIEL.—On Sept. 26, at Norwich, Cecil Jeffery Muriel, M.R.C.S., aged 87.
PHELPS.—On Sept. 29, at Great Malvern, John Henry Dixon Phelps, M.B. Oxfd, aged 74.
UTTING.—On Sept. 22, in Surrey, Ercenwin Anstey Utting, late assistant medical officer of health, St. Pancras.

Medical Diary

OCT. 6 TO 12

Sunday, 6th

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY
9.30 A.M. (Buxton.) Dr. Victor Ott: Present Swiss Conce Rheumatism and Physical Medicine.
10.15 A.M. Dr. Abraham Cohen: Use of Physostigm Rheumatoid Arthritis.
11.15 A.M. Dr. Loring T. Swaim: American Concepts on Arth

Monday, 7th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. K. J. Franklin: Fœtal Circulation and Car vascular System.
5 P.M. Prof. J. Z. Young: Nerve Injury and Nerve Regenerati

Tuesday, 8th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. K. J. Franklin: (1) Deglutition in Man and Ot Animals; and (2) Pulmonary Mechanisms for Dealing w Inhaled and Insufflated Dusts.
5 P.M. Prof. W. R. Spurrell: Control of Secretion of Saliva, Gas Juice, and Pancreatic Juice.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Experimental Medicine and Therapeutics.* Prof. H Himsworth: Protein Metabolism in Relation to Dis (Presidential address.)
5.30 P.M. *Psychiatry.* Prof. Aubrey Lewis: Education Psychiatrists. (Presidential address.)
CHELSEA CLINICAL SOCIETY
6.30 P.M. (South Kensington Hotel.) Dinner Meeting. Ronald Jarman: Modern Anæsthesia.
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. A. C. Roxburgh: Cutaneous Syphilis.
CHADWICK PUBLIC LECTURES
2.30 P.M. (26, Portland Place, W.1.) Sir Arthur MacNalt Sir Thomas More as Public Health Reformer.

Wednesday, 9th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. K. J. Franklin: (1) Eustachian Valve, Tubercul Intervenosum, and Superior Caval Blood Flow; (2) Vascular Short-circuiting within the Kidney.
5 P.M. Dr. C. J. C. Britton: Blood Grouping.
ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Dr. F. S. Cooksey: Planning Organisation of Physical Medicine Departments. (Pr dential address.)
NATIONAL HOSPITAL, Queen Square, W.C.1
4 P.M. Dr. Ludo van Bogaert (Antwerp): Progressive Atrop of the Globus Pallidus.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology). Dr. Michaelson: Pr tosis and Exophthalmos.

Thursday, 10th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. A. J. E. Cave: Thoracic Operculum.
5 P.M. Dr. C. J. C. Britton: Blood Grouping.
ROYAL SOCIETY OF MEDICINE
5 P.M. (*Ophthalmology.*) Mr. A. H. Levy: Æsthetics of Vi (Presidential address.) Mr. John Foster: Ophthal Tour in France and Switzerland. Cases will be shown 4.30 P.M.
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. H. MacCormac: Industrial Dermatitis.

Friday, 11th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. G. R. de Beer: Segmentation of the Vertebr Head.
5 P.M. Dr. Bernard Johnson: General Anæsthetics.
ROYAL SOCIETY OF MEDICINE
5 P.M. *Clinical.* Cases will be shown at 4 P.M.
ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Sir Henry Wade: Life of an Edinburgh Medical Stud 300 Years Ago. (Inaugural address.)

Appointments

BATES, J. L., M.B. Lond., M.R.C.P., D.C.H.: temp. asst. physici Kent County Hospital.
BOWES, R. K., M.S. Lond., F.R.C.S.: obstetric physician, St. Thom Hospital, London.
CLAY, JOHN, jun., M.B. Durh.: examining factory surgeon, Bald Hertford.
GILLIES, HUNTER, M.D. Glasg., D.P.M.: deputy medical sup tendent, Crichton Royal, Dumfries.
HOLDEN, C. E., M.R.C.S.: examining factory surgeon, Surbit Surrey.
O'DONNELL, J. H., M.B. Leeds, D.L.O., F.R.C.S.: asst. surg E.N.T. dept., Leicester Royal Infirmary.
PERKINS, GEORGE, M.C., M.CH. Oxfd, F.R.C.S.: orthopædic surg St. Thomas's Hospital, London.
SWANN, W. G., M.D. Belf., D.P.H., D.OBST.R.C.O.G.: deputy med superintendent officer of health and deputy port M.O., Bel

St. George's Hospital, London:
- CHARLES, A. H., M.B. Camb., F.R.C.S., M.R.C.O.G.: asst. obste and gynæcological surgeon.
- CRAWFORD, THEODORE, M.D. Glasg., F.R.F.P.S.: director pathological services.
- DOGGART, J. H., M.D. Camb., F.R.C.S.: ophthalmic surgeon.
- MALLINSON, Sir PAUL, B.M. Oxfd, M.R.C.P.: asst. psychiatrist.
- MARNHAM, RALPH, M. CHIR. Camb., F.R.C.S.: surgeon i/c pro logical dept.
- MILLER, EMANUEL, M.R.C.P., D.P.M.: psychiatrist to childr dept.
- SHIELDS, D. C., B.M. Oxfd: director of physiotherapy dept.
- YOUNG, ROBERT, B. CHIR. Camb., F.R.C.S.: asst. orthop surgeon.

SYMPATHETIC CONTROL OF BLOOD-VESSELS OF HUMAN SKELETAL MUSCLE*

HENRY BARCROFT
M.D. Camb.
PROFESSOR OF PHYSIOLOGY, QUEEN'S UNIVERSITY OF BELFAST

O. G. EDHOLM
M.B., B.Sc. Lond.
PROFESSOR OF PHYSIOLOGY, ROYAL VETERINARY COLLEGE, LONDON

Vasoconstrictor Tone

THE question whether or not the sympathetic nervous system supplies the blood-vessels in muscle and maintains vasoconstrictor tone during muscular inactivity is of fundamental importance in peripheral vascular disease. Animal investigations on the whole seem to point in that direction. Sympathetic nerve-endings have been identified histologically in the walls of blood-vessels in cat muscle (Hinsey 1928). Increase in blood-flow through muscle in the dog and cat has been observed after section of the sympathetic nerve-supply (Anrep et al. 1934, Baetjer 1930). Nevertheless general opinion, as shown by reviews by Abramson (1944), White and Smithwick (1941), and Wilkins (1942), is against the presence of sympathetic tone in the vessels in human muscle. Recent work in Belfast, however, has convinced us that such tone exists, and we submit here a summary of the evidence in favour of our view.

METHODS

The blood-vessels investigated were those in the muscles of the forearm. Details of the plethysmographic technique have already been published (Barcroft et al. 1943). We wish to emphasise here only the following points:

(1) It is important to maintain the temperature of the forearm as near as possible to its normal physiological level. Lack of this precaution is one of the reasons why the presence of tone in the blood-vessels in human muscle has not been noted by previous observers. During the experiments the limb is kept in a constant-temperature water-bath. Most workers use a water temperature near skin temperature. Grant (1938) used 30° C, most others 32° C. We have measured the temperature and blood-flow in normally clad forearms and find they are maintained at their normal levels when the limb is immersed in water at 34° C (Barcroft and Edholm 1946). Lower water temperatures depress muscle temperature and blood-flow. For example, at 30° C the rate of flow is only about a third of the normal.

(2) We have confirmed Grant and Pearson's (1938) dictum that blood-flow as measured with the forearm plethysmograph is mainly muscle blood-flow. The table shows the approximate distribution of the blood-flow to the different tissues of the forearm in the clothed arm.

EXPERIMENTAL

The proof of the existence of sympathetic tone in the blood-vessels in muscle is summarised below from the paper by Barcroft et al. (1943). Fig. 1 (*a*) shows that the blood-flow in the right forearm is about equal to that in the left. Fig. 1 (*b*) shows that the blood-flow in the left forearm is greatly increased by blocking the median, radial, and ulnar nerves just above the elbow, a technique developed by Dr. W. M. Bonnar. There are the following possible explanations for this vasodilatation:

(1) Release of the sympathetic tone in the vessels of the forearm skin.
(2) Diminution in the resistance opposed to the blood-stream owing to paralysis of tonic contraction of the skeletal muscles.
(3) Release of sympathetic tone in the blood-vessels in the muscles.

Gilding (1932) reviews the published work showing that the sympathetic fibres to skin travel with the cutaneous nerves, whereas those to muscle accompany the motor nerves. The first explanation can therefore be discarded, since the forearm skin is supplied by the antebrachial cutaneous nerves, which are not blocked. The second suggestion can be discarded, because paralysis of the muscles by nerve-block in sympathectomised subjects does not increase forearm blood-flow. Therefore the last suggestion must be correct. The increased blood-flow in the blocked forearm must be due to release of sympathetic tone in the blood-vessels of the muscles. This experiment has been done more than 25 times with consistent results. In the average forearm, blood-flow on the blocked side is about doubled. This means that the muscle blood-flow is increased about 2$^1/_2$ times. If the vasomotor centre were to release the vasoconstrictor tone throughout the skeletal muscles of the body, the blood-flow throughout the muscles would increase by more than a litre a minute.

Some experiments were done under even more strictly controlled conditions. Fig. 2 shows a forearm with adrenaline introduced into the skin by electrophoresis to arrest the cutaneous circulation. By this technique the skin becomes blanched, with occasional small cyanotic patches. The penetration of the adrenaline into the deeper layers was shown by goose-flesh and by paralysis of the sweat-glands. In such forearms the blood-flow was slightly reduced because of the decrease in the amount of blood flowing through the skin. Even so, as fig. 1 (*c*) shows, deep nerve-block increased the blood-flow far above that on the normal side. Obviously the hyperæmia could not have been in the blanched skin and must have been in the underlying muscle. The bone could be safely left out of consideration since its blood-flow is negligible compared with that of muscle (Edholm et al. 1945).

Woollard and Phillips (1932), Friedlander et al. (1938), and Grant and Holling (1938) blocked the sympathetic fibres to muscle and noted that temperature in or over the muscle did not rise. Since blocking the cutaneous nerve-supply to the fingers often causes a very large rise in finger skin temperature, these workers considered that the sympathetic vasomotor tone in muscle must be negligible. However, muscle is less vascular than finger-tip skin; so release of tone would cause far less increase in blood-flow per unit volume of tissue. Moreover in exposed forearms the muscle would be cooling, and release of tone would merely delay the rate of cooling. Further, if the limb had been exposed for some time before the block, muscle blood-flow would be subnormal, and the effect of the block would be reduced. Inferences concerning muscle blood-flow made on the basis of temperature measurements cannot be so reliable as direct plethysmographic determinations.

Warren et al. (1942) measured the forearm blood-flow with the plethysmograph and found that it was increased after paravertebral block. Their suggestion that the increase was entirely in the skin is not borne out by the deep nerve-block and adrenaline electrophoresis experiments described above.

PARTITION OF BLOOD-FLOW THROUGH VARIOUS TISSUES OF FOREARM

—	Muscle	Skin	Bone	Tendon, fascia, &c.
Blood-flow c.cm. per 100 c.cm. of forearm per minute (total flow = 3·1 c.cm.)	2·1	0·8	0·2	
Tissue c.cm. per 100 c.cm. forearm	64·0	8·6	14·0	13·4
Blood-flow c.cm. per 100 c.cm. of tissue per minute ..	3 25	9·7	1·0	0·5

---

* Based on Arris and Gale lectures delivered at the Royal College of Surgeons of England by Professor Barcroft on Dec. 19 and by Professor Edholm on Dec. 20, 1945.

6424

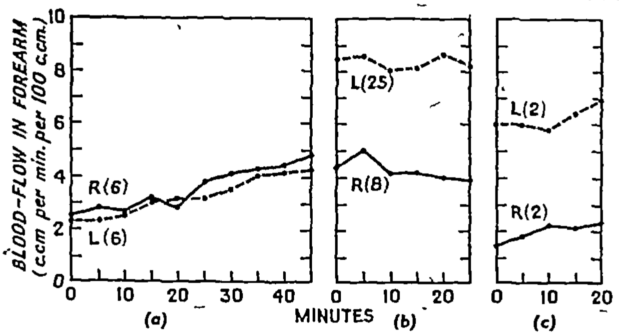


Fig. 1—Blood-flow in forearms: (*a*) right and left arms normal, showing flow equal in both arms; (*b*) deep nerve-block of left radial, median, and ulnar nerves (right arm intact); (*c*) same nerves blocked and cutaneous circulation abolished by adrenaline electrophoresis in left arm (right arm intact). The numerals in parentheses denote the number of experiments from which the averages were obtained on which the curves are based.

To sum up, there is good evidence that the release of sympathetic tone in the blood-vessels in muscle would more than double the rate of blood-flow.

PHYSIOLOGICAL RELEASE OF VASOCONSTRICTOR TONE IN MUSCLE VESSELS BY BODY HEATING

Grant and Holling (1938) found that the blood-flow to the forearm could be increased by heating the legs, but that this required very considerable heat, and the rate of increase varied. They considered that the increase in blood-flow was due to cutaneous vasodilatation. Wilkins and Eichna (1941) also obtained an increased blood-flow in the forearms on body heating, and suggested that some of the increased flow was due to vasodilatation in muscle vessels. We have now carried out this procedure on a large number of subjects with the forearm in water at 34° C, and usually found a considerable increase in the forearm blood-flow when the legs were heated. The effect is absent in sympathectomised subjects. We have also used the skin-blanching technique to analyse the effect, and have shown that the dilatation definitely takes place in the muscle blood-vessels. Fig. 3 shows dilatation in the blanched forearm following immersion of the feet in hot water. Since the increases in forearm blood-flow after deep nerve-block and after feet heating were similar, we concluded that the hyperæmia in the forearm was mainly due to release of vasoconstrictor tone in the blood-vessels of resting muscle.

COMMENT

Grant and Pearson (1938) and Wilkins and Eichna (1941) have shown, and we have confirmed, that forearm blood-flow is practically normal some weeks after sympathectomy. The tone of the blood-vessels in muscle which is released after operation gradually returns. Hence, on theoretical grounds, it does not necessarily follow that sympathectomy could achieve any permanent improvement in peripheral vascular conditions such as intermittent claudication.

Vasodilator Tone

It is now proposed to present some evidence concerning the presence of vasodilator fibres in the blood-vessels of human skeletal muscles.

Vasodilator fibres have been demonstrated by Bülbring and Burn (1937) in muscle vessels in certain animals, notably the hare. Grant and Pearson (1938) and Holling (1939) have shown that adrenaline in small quantities produces vasodilatation in human skeletal muscles. We have confirmed this (Allen et al. 1946) but have found that the dilatation is only fleeting, and, with continued infusion of adrenaline, dilatation is followed by constriction. Nevertheless the fact that a sympathomimetic substance can produce a vasodilatation suggests that adrenergic vasodilator nerves exist.

Grant and Holling (1938) have also presented evidenc of vasodilators in cutaneous blood-vessels, but the conclusions have been criticised by Warren et al. (194

The first experiments we carried out—namely, com parison of the effects of nerve-block and of heating th legs on forearm blood-flow—were inconclusive. A described above, these two procedures produced near similar effects; so it was considered that the increase i blood-flow produced by leg heating was due to release o vasoconstrictor tone alone, not to any active vas dilatation mediated by vasodilator nerves.

More convincing evidence was obtained unexpectedl during an investigation of the effects of hæmorrhage o the peripheral circulation in man, to determine the exten and degree of peripheral vasoconstriction after vene section. In one of the earliest experiments the subjec fainted, and, to our great surprise, the forearm blood flow very much increased during the faint, in spite of th sudden drop in blood-pressure. This unexpected findin made us change the original scheme, and instead a investigation of fainting was initiated (Barcroft et al 1944, Barcroft and Edholm 1945). It was in the cours of this work that evidence was obtained of the existence of vasodilator nerves to muscle blood-vessels.

The large number of blood-donors submitting to venesection has provided opportunities for skilled observation of fainting; so the literature on the subject is now considerable. The incidence of fainting in blood-donors varies, but with a venesection of some 400 c.cm. the average fainting-rate is about 5% (Poles and Boycot 1942, Brown and McCormack 1942). The incidence i affected by fatigue, hunger, and thirst. Posture i important; fainting can and does take place with th subject prone, but is much more easily provoked in th sitting or upright position. *Room temperature* is als a factor. In the Middle East, with a temperature o 100° F or more, the incidence of fainting in blood-donor might be as high as 20% (Buttle 1945). Emotiona factors certainly play a part. It has been a commo experience in blood-donor centres to observe epidemi fainting when many donors are together in view of each other; one donor faints, others follow suit. It has also

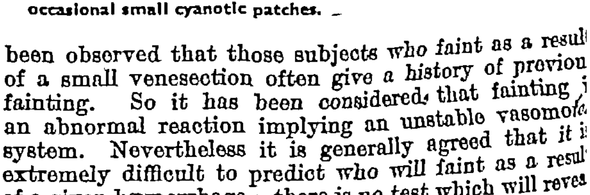


Fig. 2—Forearm, after introduction of adrenaline by electrophoresis int the skin to arrest the cutaneous circulation, showing blanching an occasional small cyanotic patches.

been observed that those subjects who faint as a resul of a small venesection often give a history of previou fainting. So it has been considered that fainting i an abnormal reaction implying an unstable vasomot system. Nevertheless it is generally agreed that it i extremely difficult to predict who will faint as a resul of a given hæmorrhage; there is no test which will reve the potential fainter. However, Wallace and Sharpey Schafer (1941) have shown that the incidence of faintin increases steadily with increase in the volume of bloo withdrawn.

Hæmorrhage is not the only stimulus which wil provoke fainting; emotional shocks, such as the sight o blood, hypodermic or intravenous injection, the uprigh posture, and anoxia, can all be effective. It is a subjec which merits investigation.

Lewis (1932), in a classical paper on the subject emphasised the salient features of a faint: sudden dro in blood-pressure, slowing of the heart, pallor, sweating ommonly nausea, and often loss of consciousness. He showed that the cardiac slowing was not an essential feature of the circulatory collapse, since atropine administered during the faint accelerated the heart without hastening recovery. Lewis epitomised his work by describing fainting as the vasovagal syndrome, meaning that there were two components of the faint, the vagal effects of cardiac slowing, nausea, &c., and a vascular effect. More recently, Barcroft et al. (1944) confirmed that fainting was not a cardiac event. They measured cardiac output with the cardiac catheter, and showed that there was no fall in cardiac output during fainting. Fainting is not a cardiac syncope; it represents a peripheral failure—i.e., the fall in blood-pressure is due to peripheral vasodilatation.

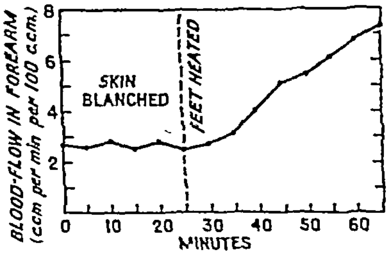


Fig. 3—Effect of leg heating on forearm blood-flow after abolition of cutaneous circulation. Curve based on average of 5 experiments.

In our investigation we used hæmorrhage to produce fainting. We wished to have a high incidence of faints o, as Wallace and Sharpey-Schafer (1941) had shown hat the greater the volume of bleeding the higher the ncidence of faints, we used large venesections. This was done by combining a venesection from the arm with a simulated venesection by inflating pressure cuffs on the thighs to diastolic pressure. Ebert and Stead (1940) have shown that such a procedure dams back up to 700 c.cm. of blood in the lower limbs. It is not unduly uncomfortable, and by releasing the pressure on the thighs the trapped blood is rapidly returned to the general circulation. The average volume of the venesection from the arm was about 500 c.cm., and this, together with pressure on the thighs, produced a faint in nearly every subject. Since our subjects were young healthy adults, this showed that fainting was not an abnormal reaction but one which could be produced by a suitable stimulus in all persons, though the strength of the required stimulus varied from subject to subject. The forearm blood-flow was recorded and the original finding confirmed; the forearm blood-flow increased in every case during the faint.

The next step was to investigate the mechanism of this vasodilatation: was it nervous or humoral? There is evidence that adrenaline secretion is increased during hæmorrhage, and adrenaline has been shown to produce a considerable vasodilatation in the forearm. So there seemed to be a distinct possibility that adrenaline secretion was responsible for this dilatation. To test this hypothesis, fainting was induced in sympathectomised subjects. These patients were rigorously tested to establish that the sympathectomy was still complete. Resting forearm blood-flow was within normal limits, as in all cases the sympathectomy had been performed some time previously. (Grant and others have shown that the forearm blood-flow is only temporarily increased after sympathectomy, the vessels soon recovering their tone.)

In these subjects forearm blood-flow did not increase during fainting; on the contrary, the blood-flow diminished as the blood-pressure fell, and recovered when the pressure rose again. This finding provided definite evidence that the dilatation in normal subjects was not due to the secretion of adrenaline or any other humoral agent, for such effects would still have been present after sympathectomy. On the other hand, since the dilatation was abolished when the vasomotor nerves were absent, it was evident that the dilatation was mediated by the vasomotor nerves.

The next problem was to establish the site of the vasodilatation. A striking feature of the vasovagal syndrome is the intense pallor of the skin, and it seemed very unlikely that the considerable increase in blood-flow could be taking place in the skin vessels. This was investigated by comparing the blood-flow in the hand and forearm. The hand consists largely of skin and bone with only 15% muscle. If the vasovagal dilatation takes place in muscle vessels only, the rate of flow through the hand should diminish during fainting. And that was what we found. Weiss et al. (1937) have previously shown that, during the circulatory collapse induced by amyl nitrite, a collapse which closely resembles the vasovagal reaction, the blood-flow through the hand is unrecordable. However, Rushmer (1944) reported that, in the collapse induced by needling the brachial artery, plethysmograph records of the finger-tip indicated a vasodilatation. Nevertheless in the hand as a whole there is no doubt that the blood-flow decreases during fainting. So it was concluded that, during fainting induced by hæmorrhage, there was a sudden vasodilatation in muscle blood-vessels due to nervous impulses.

This conclusion led to the next question: was the dilatation solely due to the removal of vasoconstrictor tone, or did active vasodilatation occur? Experiments were carried out in subjects in whom a nerve-block was performed in one arm. This procedure, as described above, removes vasoconstrictor tone and therefore increases the rate of forearm blood-flow. When fainting was induced in these subjects, the blood-flow decreased as the blood-pressure fell, behaving similarly to the sympathectomised forearm. But in these subjects the level of blood-flow during the faint was much less than that in the normal arm during the faint. Considering the conditions in the two arms, one with the nerve-block and the other intact, in the first vasoconstrictor tone had already been removed by the nerve-block. If the vasodilatation during the faint was solely due to the removal of vasoconstrictor tone, then the conditions in the two arms during the faint should be the same: in the one arm vasoconstrictor tone removed by nerve-block before the faint, in the other removed by fainting. But the flow in the normal arm at this stage was much greater than in the blocked arm; so this increase could not be solely due to the removal of vasoconstrictor tone, otherwise the level of blood-flow during the faint should be the same in the two arms. During fainting, in brief, there is an increase in forearm blood-flow greater than can be explained solely by the removal of vasoconstrictor tone. It has been shown that no humoral agent is involved and that the skin vessels play no part. The only reasonable conclusion is that part at any rate of this vasodilatation is mediated by vasodilator nerves.

Summary

The technique of demonstrating sympathetic vasoconstrictor tone in blood-vessels in human skeletal muscles is described.

Blood-flow in muscles is more than doubled by the release of sympathetic tone.

Heating the body relaxes the vasoconstrictor tone in blood-vessels supplying muscles.

Vasoconstrictor tone gradually returns to the blood-vessels of sympathectomised subjects.

Vasodilatation takes place in the muscles of the forearm after fainting, except in sympathectomised subjects. Therefore this vasodilatation is due to nervous control.

It is shown that vasodilatation in the forearm muscles is not due merely to removal of vasoconstrictor tone but that it is, at any rate in part, mediated by vasodilator nerves.

References at foot of next page

PSYCHONEUROSES
TREATED WITH ELECTRICAL CONVULSIONS
THE INTENSIVE METHOD

W. LIDDELL MILLIGAN
M.D., B.Sc. Glasg.
DEPUTY PHYSICIAN-SUPERINTENDENT, ST. JAMES HOSPITAL, PORTSMOUTH

THOUGH there has been some agreement concerning the benefit obtained from electro-convulsive therapy in certain psychoses, recent publications show divergent opinions about its use in the psychoneuroses. Those who believe in its efficacy have so far produced little evidence in support of their statements. Good (1940), Cheney et al. (1941), Zeifert (1941), Furst and Stouffer (1941), Low et al. (1938), and Shapiro and Freeman (1939) report good results in small series of cases, and Feldman et al. (1945) have reported a considerable improvement in 2 cases of acute hysteria. Kerman (1945) mentions only 1 case of psychoneurosis out of 300 various psychotic patients treated by this method, and this patient was only partially improved. Pacella and Barrera (1943) report rather poor results, Smith et al. (1943) state that it is of doubtful value, and Walshe (1945) goes so far as to say that convulsion therapy has no place in the treatment of the psychoneuroses.

This report deals with 100 psychoneurotic patients treated in St. James Hospital, Portsmouth, during the past five years. The intensive method described was originated by Dr. Thomas Beaton, physician-superintendent of this hospital.

METHOD

The apparatus used is a special model manufactured by the Solus Electrical Co. Ltd. All unnecessary recording instruments—*e.g.*, for determination of head resistance—have been eliminated. The maximum voltage is 200, and the time mechanism is calibrated in tenths of a second, increasing by $^1/_5$ sec. intervals to a maximum of 1 sec. It has been found, in treating many patients, that a high voltage can be used with certain advantages and no untoward results. The average dose used has been 180 volts at 0·4 sec. This produces a convulsion in nearly every case and has the further advantage that it eliminates the usual preceding cry. This is very helpful when many patients are being treated in a ward with only movable screens between the beds. No restraint is used, and the only precaution taken, apart from the usual gauze gag, is the use of a dorsal pillow to keep the patient in a position of slight opisthotonos.

The machine, which has a silently acting switch, is moved slowly down the ward on a trolley, and the ward sister manipulates the electrodes while the doctor operates the apparatus. The electrodes are mounted on a flexible metal band of horseshoe shape similar to that used in headphones. This is held momentarily in position on the patient's forehead by means of insulated handles on the outer side of the electrodes. By this method it is possible to treat 20 patients in eight minutes.

We have recently introduced a wireless-set to provide light music during treatment. This is perhaps a minor point, but it helps patients awaiting treatment to pass the time and prevents apprehension while the patient in the next bed is receiving treatment. It also ensures that patients regaining consciousness return to a more cheerful environment.

The number and spacing of treatments vary from case to case. Cook (1944), in a review of convulsion therapy, quotes the average as three a week, and Stockings (1944) refers to the frequency used in some of his own cases—one a day—as drastic. We have employed an intensive method in many cases, particularly in those of long standing. This sometimes involves as many as four treatments a day, the dosage being modified as the patient responds to treatment. The confusion, amnesia, and complete disorientation produced by such treatment call for very careful nursing. In some cases it is necessary to reduce the patient to the infantile level, in which he is completely helpless and doubly incontinent.

The course of treatment is then adjusted so that the patient is allowed gradually to emerge from the confusional state. During this time simple psychotherapy, in the form of explanation and reassurance, is given, and the helpful attitude of the nurses is of the greatest importance. Occupational therapy is used as an adjuvant, and the patient is encouraged to take part in social activities. We are fortunate in that this hospital is situated in the city itself, so that, by a system of gradually extending parole, the patient can slowly resume a normal form of life.

After discharge from hospital the patient usually returns to work immediately and reports at the out-patient department for several months, if necessary. All cases in this series have been followed for a period ranging from eight months to five years.

THEORY OF ACTION

The most satisfactory explanation of the action of electro-convulsion therapy so far advanced is quoted by Brain and Strauss (1945). This postulates the presence of faulty electrical patterns in the brain which are altered by the treatment, the resulting amnesia allowing time for the brain to become accustomed to simplified patterns. If this is so, it is a definite indication for the use of the intensive method, which appears to obliterate entirely the faulty patterns, and thus allows the patient to be rehabilitated along correct lines.

RESULTS

The criteria used in assessing the condition of patients on discharge were as follows :

Patients noted as "*recovered*" were discharged symptom-free and apparently quite stable ; no patient discharged in this category has relapsed.

All patients noted as "*relieved*" were much improved, and most of them were symptom-free, but they were placed in this category if there was any doubt about their stability. Only 6 of the 46 patients in this category have shown any signs of relapse, and 3 of these had received insufficient treatment, having left hospital before the course was completed.

PROFESSORS BARCROFT AND EDHOLM : REFERENCES

Abramson, D. I. (1944) Vascular Responses in the Extremities of Man in Health and Disease, Chicago.
Allen, W. J., Barcroft, H., Edholm, O. G. (1946) *J. Physiol.* (in the press).
Anrep, G. V., Blalock, A., Samaan, A. (1934) *Proc. roy. Soc.* B, **114**, 233.
Baetjer, A. M. (1930) *Amer. J. Physiol.* **93**, 41.
Barcroft, H., Bonnar, W. M., Edholm, O. G., Effron, A. S. (1943) *J. Physiol.* **102**, 21.
— Edholm, O. G. (1945) *Ibid*, **104**, 161.
— — (1946) *Ibid*, **104**, 366.
— — McMichael, J., Sharpey-Schafer, E. P. (1944) *Lancet*, i, 489.
Brown, H., McCormack, P. (1942) *Brit. med. J.* i, 1.
Bülbring, E., Burn, J. H. (1937) *J. Physiol.* **88**, 341.
Buttle, G. A. H. (1945) personal communication.
Ebert, R. V., Stead, E. A. jun. (1940) *J. clin. Invest.* **19**, 561.
Edholm, O. G., Howarth, S., McMichael, J. (1945) *Clin. Sci.* **4**, 103.
Friedlander, M., Silbert, S., Bierman, W., Laskey, N. (1938) *Proc. Soc. exp. Biol., N.Y.* **38**, 150.
Gilding, H. P. (1932) *J. Physiol.* **74**, 34.
Grant, R. T. (1938) *Clin. Sci.* **3**, 157.
— Holling, H. E. (1938) *Ibid*, p. 273.
— Pearson, R. S. (1938) *Ibid*, p. 119.
Hinsey, J. C. (1928) *J. comp. Neurol.* **47**, 23.
Holling, H. E. (1939) *Clin. Sci.* **4**, 103.
Lewis, T. (1932) *Brit. med. J.* i, 873.
Poles, F. C., Boycott, M. (1942) *Lancet*, ii, 531.
Rushmer, R. F. (1944) *Amer. J. Physiol.* **141**, 722.
Wallace, J., Sharpey-Schafer, E. P. (1941) *Lancet*, ii, 393.
Warren, J. V., Walter, C. W., Romano, J., Stead, E. A. jun. (1942) *J. clin. Invest.* **21**, 665.
Weiss, S., Wilkins, R. W., Haynes, F. W. (1937) *Ibid*, **16**, 73.
White, J. C., Smithwick, R. H. (1941) The Autonomic Nervous System, New York.
Wilkins, R. W. (1942) Advances in Internal Medicine, vol. I, New York.
— Eichna, L. W. (1941) *Bull. Johns Hopk. Hosp.* **68**, 425.
Woollard, H. H., Phillips, R. (1932) *J. Anat., Lond.* **67**, 18.

The 2 women noted as "*not improved*" responded treatment at the outset but left hospital before the urse was completed. The male patient included in is category was approaching senility and was precluded om receiving intensive treatment because of his hysical condition.

The numbers discharged in these categories are as llows :

	MALE		FEMALE
Recovered	25	......	27
Relieved	19	......	26
Not improved	1	......	2

hus 51% were classified as "recovered," 46% as relieved," and 3% as "not improved."

The differential classification is as follows :

—	MALE			FEMALE		
	Recovered	Relieved	Not improved	Recovered	Relieved	Not improved
nxiety states ..	10	10	1	8	8	1
ysteria	9	4	..	14	13	1
bsessional states	4	..	..	5	2	..
ixed states ..	2	5	..	..	3	..

ILLUSTRATIVE CASE-RECORDS

CASE 1.—A male married chartered accountant, aged 36, was admitted on April 30, 1945, with four months' history of inability to work owing to a "constant series of figures passing through my mind." He also complained of a severe pain in the throat, preventing him from swallowing properly, and he expressed the fixed idea that this was due to cancer.

Mental State.—An immature type of man, rather childish in manner, very hypochondriacal, anxious, worried, and very apprehensive. He could not speak without first striking his left thigh.

Family History.—Father, aged 56, had died of cancer of the stomach. Mother had died of cerebral hæmorrhage six months ago. She was said to have been a domineering type of woman, on whom the patient had been very dependent, even after his marriage. Her sudden death seems to have been the precipitating factor in the patient's illness. No siblings.

Personal History.—Patient had not had any serious illness. He was said to have worried over details. His school career had been brilliant, and he now held a very responsible position.

Diagnosis.—Obsessive-compulsive neurosis.

Treatment.—April 30, 1945: 3 convulsions induced at 10 A.M., 11 A.M., and 3 P.M.

May 1: 2 convulsions induced at 10 A.M. and 4 P.M.; patient was confused and rather restless, but made no complaints about his throat, and spoke naturally and without his thigh-striking ritual. May 2: 2 convulsions induced at 10 A.M. and 3 P.M. May 3: a convulsion induced at 10 A.M.; patient was confused, amnesic, and completely disoriented. May 5: a convulsion induced at 10 A.M. May 10: he was no longer confused, but there was complete amnesia for events which happened during the week before admission. May 12: a convulsion induced at 10 A.M. May 30: he was well and symptom-free, except for a patchy amnesia, which was slowly clearing.

June 8: improvement had been maintained: patient was discharged "recovered."

July 12: reported in outpatient department (OP); he had remained well and now had a full recollection of events leading up to his admission; he said that he still had slight difficulty in remembering the names of acquaintances.

Sept. 4: reported in OP; he had remained very well and said that he had now no memory difficulties.

Dec. 6: reported in OP; he was completely symptom-free and had no complaints whatsoever.

April 2, 1946: contacted by telephone, he said he had remained perfectly well.

CASE 2.—A male married draughtsman, aged 41, was admitted on March 29, 1945, with fifteen years' history of recurrent attacks of vomiting.

Personal History.—He was said to have been liable to worry unnecessarily since childhood. The attacks of vomiting had been becoming progressively worse; and whereas they had formerly lasted only a few days, with remissions of several months, the present attack had lasted three months, even a glass of water causing him to vomit. In the past ten years he had attended sixteen different doctors, had been admitted to general hospitals four times, for periods varying from two to five months, and in one of these hospitals a laparotomy had been performed. No organic lesion had been found at any time during his illness.

Family History.—Mother, aged 64, said to be nervous and unstable. Father, aged 61, fit and well. Siblings, eight brothers and two sisters, all said to be nervous.

Mental State.—Very hypochondriacal, anxious, worried, and easily upset by trifling incidents, manifesting this by acute attacks of anxiety. He realised that these acute attacks were responsible for his gastric upset.

Diagnosis.—Chronic anxiety state.

Treatment.—March 30, 1945: 3 convulsions induced at 10 A.M., 12 noon, and 2 P.M. At 4 P.M. patient was only slightly confused. March 31: 4 convulsions induced at 10 A.M., 12 noon, 2 P.M., and 4 P.M.; at 6 P.M. patient was confused, amnesic, and disoriented in time.

April 1: 3 convulsions induced at 10 A.M., 2 P.M., and 5 P.M.; patient was now very confused and completely disoriented, tended to be restless, and required careful supervision. April 2: a convulsion induced at 10 A.M. April 6: a convulsion induced at 10 A.M.; patient was now only slightly confused, was bright and cheerful, had no complaints, and enjoyed full hospital diet. April 8 and 10: a convulsion induced at 10 A.M. each day. April 16: he was now bright and cheerful, coöperative, and symptom-free; he said he enjoyed his food for the first time in fourteen years and could eat anything; his interests were varied, and he was doing some fairly heavy manual labour in the villa garden. April 26: he remained well and, though he was occasionally upset, the resulting anxiety reaction was much less severe than formerly. April 28 and 30: a convulsion induced at 10 A.M. each day.

May 17: he remained well and symptom-free. May 20: discharged "recovered."

June 21: attended OP; had remained well, had started work, and reported no difficulties.

Sept. 6: attended OP; was very well and said he could eat anything and had gained 2 st. in weight during the past three months.

Dec. 20: attended OP: he had remained well.

Feb. 21, 1946: attended OP; he said he felt perfectly fit and had no complaints; he had gained self-confidence and was apparently stable.

April 11: reported at OP; had remained perfectly well.

CASE 3.—An unemployed single man, aged 51, was admitted on Sept. 1, 1945, with twenty years' history of epigastric pain and ten years' history of inability to swallow solids.

Personal History.—No illness or accident until the age of 22, when he was badly wounded while serving in an infantry regiment during the war 1914–18. He had been in hospital eighteen months and had subsequently had many operations for the removal of shrapnel. He had been employed as a stage hand from 1921 to 1926, but since then had done no work, lived on his disability pension, and had been a chronic invalid. He had been admitted to five general hospitals for investigation, and laparotomy had been performed twice. No organic lesion had ever been found. For the past ten years he had been existing on a diet composed solely of three pints of milk a day, with an occasional raw egg.

Family History.—Parents had died of natural causes, and little information was available about them. He had one brother and four sisters alive and well. These relations lived in widely separated parts of the country and had on many occasions received telegrams summoning them to patient's bedside. On each occasion the message has been dictated by patient, who said he was dying.

Mental State.—Egocentric, petulant, and plausible, and delighted in giving a long circumstantial account of his illness, going into unnecessary details. He showed no trace of depression, though he complained bitterly of his treatment in other hospitals and said that no doctor had ever properly understood his case.

Diagnosis.—Hysteria.

Treatment.—Sept. 2, 1945: 3 convulsions induced at 10 A.M., 12 noon, and 4 P.M. Sept. 3: 2 convulsions induced at 10 A.M. and 2 P.M. Sept. 4: 2 convulsions induced at 12 noon and 3 P.M.; he was very confused, completely disoriented, and restless, and his habits had become faulty. Sept. 5, 6, and 8: a convulsion induced at 10 A.M. each day. Sept. 10: he was less confused but tended to be very elated. Sept. 12: a convulsion induced at 10 A.M. Sept. 16: he was bright, cheerful, and contented, and had no complaints.

Oct. 3: he was quite settled, worked well in the villa garden, and had, for the past fortnight, enjoyed full hospital diet; he ate his food with great relish; there was no trace of either confusion or amnesia.

Oct. 9: he was discharged "recovered." Oct. 23: reported in OP; he had remained well and had no complaints.

Nov. 20: reported in OP; he had remained well and was apparently stable.

March 28, 1946: reported in OP; he had remained very well and said he could eat anything and hoped to find employment in the near future.

CASE 4.—A married male bus conductor, aged 48, was admitted on Nov. 2, 1945, with three years' history of severe pain in the back, preventing work.

Personal History.—Had been healthy and had a good work record until 1941, when he had received severe burns of the lower limbs in a motor accident. He had spent nine months in a general hospital and been unable to resume employment until November, 1942.

Three years ago, while employed as a bus conductor, he had accidentally fallen down the stairs of his omnibus. He had complained of pain in the back, but had been able to continue work. He had consulted his doctor, who had treated him for a month; but, as the pain had still persisted, he had been referred to the OP of a general hospital. There it had been thought that he had a tuberculous lesion of the spine, and he had spent the next two months in a sanatorium. He had then been referred to an orthopædic surgeon, who had recommended massage and radiant heat, as no bony injury had been found on radiography. As there had been apparently no alteration in either the nature or the severity of the pain, he had been fitted with a plaster-of-paris spinal jacket. Two months later he had been admitted to an E.M.S. hospital, where for three months he had been investigated and treated. He had again been fitted with a spinal jacket and discharged from hospital.

For three years he had been receiving £5 a week compensation.

Family History.—He was one of a family of fourteen. One brother had died of pulmonary tuberculosis.

Mental State.—Though he said he was very worried and depressed because of his inability to work, there was no trace of this at the interview, when he was quite cheerful. He walked in a most peculiar manner, with the aid of two walking-sticks. He gave a reasonable account of himself and said he was most anxious to resume his employment.

Diagnosis.—Hysteria.

Treatment.—Nov. 3, 1945: 4 convulsions induced at 10 A.M., 12 noon, 4 P.M., and 6 P.M. Nov. 4: 3 convulsions induced at 10 A.M., 2 P.M., and 4 P.M.; patient was very confused, constantly asked why he was in hospital, and said there was nothing wrong with him. He walked in a fairly natural manner. Nov. 5 and 6: a convulsion induced at 10 A.M. each day. Nov. 8: he was much less confused, but did not remember why he was admitted. Nov. 9, 12, and 14: a convulsion induced at 10 A.M. each day. Nov. 15: he was now rather elated, but had no complaints and was walking normally.

Dec. 20: He remained very well and was much more settled; he now fully appreciated the reason for his admission. Dec. 25: he was bright, cheerful, and symptom-free, and was assisting the gardener; he had been demonstrating his physical capabilities to his fellow-patients by man-handling a heavy garden roller single-handed.

Jan. 2, 1946: discharged "recovered."

Feb. 14: reported in OP; he had remained well and had resumed work.

April 9: reported in OP; he said he felt very well, was completely symptom-free, and was finding no difficulties in connexion with his employment.

CASE 5.—A married housewife (ex-school teacher), aged 43, was admitted on Jan. 16, 1944, with fifteen years' history of a constant feeling of faintness; inability to walk more than a few steps without collapsing; inability to write or knit, owing to weakness of hands; and inability to sleep.

Personal History.—She had been fairly well until the birth of her son, fifteen years ago. Since then she had adopted the rôle of a permanent invalid, had been very jealous and possessive, and constantly demanded the complete attention of her husband and son. She said she had no friends.

Family History.—Mother had died of cancer at 65. She was said to have been a dominating type of woman, who never allowed the patient to do anything for herself. Father had died of cancer at 62. No siblings.

Mental State.—She was very miserable, self-pitying, and petulant, and could talk of nothing but her various symptoms. She constantly demanded attention and, if this was not forthcoming immediately, wept copiously and called out for her husband and "baby." Her conversation was carried on in an exhausted whisper, but she could raise her voice considerably when she wanted anything.

Diagnosis.—Hysteria.

Treatment.—Jan. 17, 1944: 2 convulsions induced at 10 A.M. and 12 noon. Jan. 18: 2 convulsions induced at 12 noon and 4 P.M. Jan. 19: 2 convulsions induced at 10 A.M. and 3 P.M.; she was still miserable and emotional but was sleeping well without sedatives. Jan. 20: 2 convulsions induced at 10 A.M. and 4 P.M.; she was becoming more confused but was now very hostile. Jan. 21: 2 convulsions induced at 10 A.M. and 12 noon; she was very confused, disoriented, and very restless. Jan. 22 and 23: a convulsion induced at 10 A.M. each day. Jan. 27: a convulsion induced at 10 A.M.; she was now bright and cheerful and had no complaints, though she was still confused.

Feb. 2 and 6: a convulsion induced at 10 A.M. each day. Feb. 15: she was very much improved, bright, cheerful, and coöperative, attended the occupational therapy department daily, and mixed well with other patients; she now said her husband had always spoiled her, and that it would "do her good" to have another child.

March 23: improvement maintained; she was cheerful and energetic; she attended all functions and was especially keen to be present at the dances. March 30: discharged "recovered."

April 18: reported in OP; she had remained well and was doing all her own housework for the first time in seventeen years.

June 7, 1945: reported in OP; she had remained very well, and her husband said she was a "changed woman."

March 22, 1946: social worker visited patient in her home and reported that she was perfectly well; bright and sociable, and had made many friends in the neighbourhood.

CASE 6.—A single female cashier, aged 25, was admitted on Jan. 3, 1945, with two years' history of breathlessness, palpitation of heart, frontal headache, and a constant feeling of tension.

Personal History.—She had been perfectly fit until three years ago, when she had had an attack of rheumatic fever. She had been told that her heart might be affected, and since then she had been very easily upset.

Family History.—Mother had died of cancer at 53. Father, aged 63, had "heart trouble." She had two brothers. A sister had died of "heart trouble."

Mental State.—She was very anxious, worried, apprehensive, dissatisfied with life, and very hypochondriacal. Her father had remarried two years ago, and she expressed great resentment at this, becoming rather excited and emotional when discussing it. She was very miserable and said she did not like being an invalid.

Diagnosis.—Anxiety state.

Treatment.—Jan. 24, 1945: she had been treated on general lines; but, though slightly brighter, she was still very unstable and complained of her cardiac condition. There was no physical lesion to explain her breathlessness and tachycardia, which were undoubtedly anxiety manifestations.

Feb. 3: 2 convulsions induced at 10 A.M. and 5 P.M. Feb. 4 and 5: 2 convulsions induced at 10 A.M. and 2 P.M. each day. Feb. 6–10: a convulsion induced at 10 A.M. each day. Feb. 14: a convulsion induced at 10 A.M.; she was confused and rather restless, but was now elated and made no complaints. Feb. 16: a convulsion induced at 10 A.M. Feb. 28: she was still slightly confused and amnesic but more settled and was sleeping well.

March 10: she was bright, cheerful, coöperative, and symptom-free, attended the occupational therapy department daily, enjoyed walking, and took part in all social activities.

March 28: discharged "recovered."

April 19: reported in OP; she had remained well and was anxious to start work.

July 5: reported in OP; she said she was very well and had been working as a cashier for the past two months and had no difficulty in carrying out her duties.

Nov. 22: visited by social worker, who said that she had remained well and could take part in all normal social activities.

March 21, 1946: reported in OP; she had remained very well.

Case 7 is included to illustrate the necessity of giving a thorough course of treatment to every patient. In this case treatment was suspended owing to an unfortunate accident, and the patient left hospital against advice. She remained well for three months but subsequently relapsed. She was recently readmitted and is now receiving a complete course of treatment.

CASE 7.—A single woman, aged 52, of no occupation, was admitted on Oct. 7, 1945, with two years' history of overwhelming fear that she would do some "terrible thing" if she did not wear a particular pair of gloves.

Personal History.—She had always been very healthy and had led an active life in the country. About two years ago she had had an inconclusive love affair (her only one), and this had left her with a strong feeling of guilt. Since then there had been a gradual development of obsessional ideas and ritual, which now dominated her completely.

Family History.—Father, a country gentleman of high intellectual attainments, had died of cerebral hæmorrhage 10 years ago. Mother an overanxious type, on whom the patient depended completely and who treated the patient as a child. Mother and daughter had been living alone for the past three years and were inseparable. No siblings.

Mental State.—She was very restless, apprehensive in the extreme, and agitated, and continually asked that her hands should be tied together in case she should harm anyone. She said she was terrified lest she should be left alone for even a minute.

Diagnosis.—Obsessional state.

Treatment.—Oct. 7, 1945: 3 convulsions induced at 11 A.M., 12 noon, and 5 P.M. Oct. 8: 2 convulsions induced at 10 A.M. and 4 P.M.: patient was very restless and confused, and constantly asked where she was. Oct. 9: patient accidentally fell out of bed and sustained an injury to the left side of the face: radiography revealed no bony injury; but, as she complained of severe pain on opening the mouth, electrical treatment was suspended for the time being. Oct 12: she was still slightly confused but bright and cheerful, having forgotten her obsessional ideas.

Nov. 7: she remained fairly well and said she remembered her previous obsessions but now laughed at them; she refused to remain in hospital for further treatment as she was worried about her mother. Nov. 12: discharged at her own request, contrary to medical advice, "relieved"; she was cheerful, had no complaints, and no memory difficulties, and was relatively stable, but it is unlikely that she will remain so in view of the curtailed course of treatment.

Feb. 6, 1946: patient telephoned to report that she remained well.

March 2: patient telephoned to report that she had been very worried about her mother's health during the past fortnight; she had lost a good deal of sleep and was again afraid that she might injure someone. March 10: readmitted to hospital; her mental condition was similar to that on her first admission.

DISCUSSION

These results seem to indicate that electro-convulsive therapy, particularly the intensive method, is of the greatest value in the treatment of selected cases of psychoneuroses. Though this is a physical method of treatment, it is of the utmost importance to adopt sound psychological principles in the rehabilitation and remoulding of the patient's personality during the recovery period. Mere obliteration of psychologically unacceptable patterns of thought and conduct is not sufficient, and the resynthesis of the personality requires much care and judgment.

In the present series the main factor militating against successful treatment has been an inherent constitutional defect, which may range from slight immaturity to definite high-grade mental deficiency. As might be expected, approaching senility is another factor of unfavourable prognostic import.

The anxiety states, on the whole, respond well, especially those of long duration. Cases of conversion hysteria do very well and, more important still, do not tend to relapse, if thorough treatment has been carried out. Striking results are obtained in obsessional states, which do not respond to other methods of treatment, except prefrontal leucotomy. It is admitted that, except in four cases, the follow-up has not been long enough to permit of dogmatic statements regarding the benefits of electro-convulsive therapy over the latter procedure, but the advantages are, nevertheless, apparent. There is practically no danger attached to the use of electro-convulsive therapy, and in our opinion no patient should be subjected to prefrontal leucotomy before a complete intensive course of electrically induced convulsions has failed to produce the desired effect.

In the light of experience it has been the custom of this hospital, during the past year, to use electro-convulsive therapy on inpatients only. It was found that outpatients returning to their home environment after each treatment did not respond satisfactorily. In using the intensive method it is essential to have the patient in hospital, and in view of the gross confusion, restlessness, and, especially in hysterics, the occasional outbursts of impulsive behaviour, this treatment should only be carried out in a mental hospital, where there are adequate facilities for dealing with disordered behaviour. The mental hospital has the added advantage that it usually possesses extensive grounds, and this is of great importance to the convalescent patient.

The use of electro-convulsive therapy greatly shortens the duration of psychoneurotic illness; and, especially in chronic cases, it seems to be of much more value to admit the patient to hospital for a month or six weeks rather than to compel attendance at an outpatient department for many months or even years. Many psychoneurotics are notoriously lacking in patience with regard to their treatment and become very bored with hospital life. The use of electro-convulsive therapy prevents this completely and tides the patient over the initial period of readjustment to hospital routine. It is just this adaptation that the psychoneurotic often finds impossible because of his general maladjustment to environment. It is not, however, suggested that this treatment should be used merely as a short cut—on the contrary, great care should be exercised in the selection of cases. In this hospital only a relatively small proportion of psychoneurotics have been treated by this method. In most of these cases the symptoms were of long duration and the more recent cases had proved resistant to psychotherapeutic measures.

None of these cases has exhibited the prolonged memory defects noted by Brody (1944), and in this connexion it seems that his statement about the contra-indications to the use of this form of therapy is, to say the least, dogmatic. This series included several school-teachers, a chartered accountant, the department manager of a large business, a bus conductor, and a cashier. It would have been grossly unfair to debar these patients from treatment on the grounds of occupation alone. A patient (not included in this series), who was treated by intensive electro-convulsive therapy, is employed in a Government department as a linguist and reports that she has no memory difficulties but continues to express herself freely in five languages.

SUMMARY

The results of electro-convulsive therapy in 100 cases of psychoneuroses are summarised.

An intensive method was used in many cases, up to four convulsions being induced daily. This procedure is especially suitable for chronic cases.

All cases responded well, but the most striking results were noted in those of long duration.

Electro-convulsive therapy should not be used indiscriminately; the greatest care should be taken in selecting cases.

The course of treatment for each patient should be based on the original clinical findings and modified according to the response produced.

I wish to thank Dr. Thomas Beaton, physician-superintendent of this hospital, for helpful criticism and for permission to use the case material; and Dr. Elizabeth Barker, senior assistant physician of the hospital, for help in connexion with the female case-records.

REFERENCES

Brain, W. R., Strauss, E. B. (1945) Recent Advances in Neurology and Neuropsychiatry, London, p. 125.
Brody, M. (1944) *J. ment. Sci.* 90, 777.
Cheney, C. O., Hamilton, D. M., Heaver, W. L. (1941) *Arch. Neurol. Psychiat.* 46, 935.
Cook, L. (1944) *J. ment. Sci.* 90, 435.
Feldman, F., Susselman, S., Lipetz, B., Barrera, S. E. (1946) *J. nerv. ment. Dis.* 102, 498.
Furst, W., Stouffer, J. (1941) *Arch. Neurol. Psychiat.* 46, 743.
Good, R. (1940) *J. ment. Sci.* 86, 491.
Kerman, E. (1945) *J. nerv. ment. Dis.* 102, 233.
Low, A. A., Sonenthal, I. R., Blaurock, M. F., Kaplan, M., Sherman, I., Whitcomb, F. C. (1938) *Arch. Neurol. Psychiat.* 39, 717.
Pacella, B. L., Barrera, S. E. (1943) *Amer. J. Psychiat.* 99, 513.
Shapiro, H. D., Freeman, W. (1939) *Med. Ann. Dist. Columbia*, 8, 65.
Smith, L. H., Hastings, D. W., Hughes, J. (1943) *Amer. J. Psychiat.* 100, 351.
Stockings, G. (1944) *J. ment. Sci.* 90, 551.
Walshe, F. M. R. (1946) Diseases of the Nervous System, Edinburgh, p. 341.
Zeifert, M. (1941) *Psychiat. Quart.* 15, 772.

EFFECT OF TEMPERATURE ON SEDIMENTATION-RATE

K. B. Rogers
M.B. Lond.

LATELY PATHOLOGIST, SHOTLEY BRIDGE EMERGENCY HOSPITAL, CO. DURHAM

The effect of temperature on the erythrocyte-sedimentation rate has been noted by workers using all the different techniques that are known. Westergren (1921) suggested a correction for it, especially if cases were to be followed up, but he stated that the difference in temperature in the average laboratory was not great. Nichols (1942) states that any technique is valueless if the results are not comparable on repetition, and he notes the importance of a constant temperature if the results are to be reproducible. It was through trying to obtain reproducible results that the following work was performed; there is a regional chest centre based on this hospital, and some cases have to be tested many times.

The standard E.M.S. issue is the Westergren apparatus. With the stand supplied, if one of the six tubes was fixed vertically with its lower end in the centre of the rubber pad at the base, it was found that, if the other five tubes were also to be vertical, their lower ends were scattered round the periphery of their respective pads, and none of them would occupy the same relative position; this wasted a great deal of time when the tubes were set up. Also, it became obvious that the Westergren technique would not allow for the changes in corpuscular volume, such as resulted if a patient had had much blood-loss or a transfusion before operation.

ANALYSIS OF 736 CASES USED IN TESTING SEDIMENTATION-RATE

Chest investigation	No. of cases	Medical wards	No. of cases	Surgical wards	No. of cases
Carcinoma of œsophagus	6	Psychoneurosis	75	Carcinomata	23
Carcinoma of bronchus	27	Peptic ulceration	24	Osteomyelitis	7
Mediastinal Hodgkin's disease	7	Diarrhœa	15	Postoperative sepsis	21
Cardiovascular lesions	12	Infective hepatitis	4		
Lung abscess	17	Malaria	29		
Empyema	50	Urinary infections	13		
Bronchiectasis	55	Blood diseases	29		
Bronchitis	72	Rheumatism and chorea	62		
Pulmonary tuberculosis	142	Arthritis and spondylitis	40		
Pick's disease	6				
Total ..	394		291		51

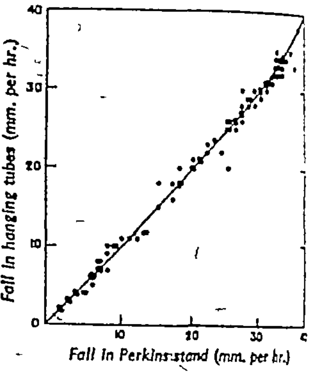


Fig. 1—Comparison of readings at 20° C in the Perkins stand and in hanging tubes, showing very little difference.

A change was therefore made to the Wintrobe technique, using the Perkins stand and the correction graph of Hynes and Whitby (1938). The results were still not reproducible, and the variant factor was temperature. The laboratory is a single-storied building placed on an exposed hillside, and the temperature could vary 7° C in a day, and more than 15° C between winter and summer. Mere statement that the test was performed in a certain season gives no indication of the average temperature: four inches of snow appeared in a recent May.

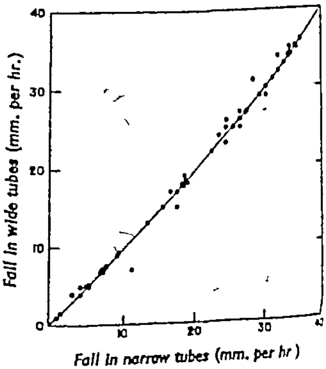


Fig. 2—Comparison of readings at 20° C in tubes 3·5 mm. in diameter (Rourke and Ernstene 1930) and in tubes 2·5–2·8 mm. in diameter (Wintrobe), showing very little difference.

TECHNIQUE

To perform the following experiments an apparatus had to be devised that would allow the sedimentation tubes to be kept at controlled temperatures. A holder was designed to slip over the top of the tube and allow it to hang as its own plumb-line (Rogers 1946). The tubes were suspended in water contained in a glass 7-lb. sweet jar by passing them through a perforated cardboard lid; one set of tubes was kept at a standard temperature of 20° C and the other at the test temperature. (A tube stops swinging within a few seconds when suspended in water.)

The temperature was maintained to within 1° C; thus, if there was to be a mean temperature of 10° C, the water was placed at 9·5° C; when it was warmed to 10·5° C, the lid was lifted off the jar, and the tubes were transferred to another sweet-jar with water at 9·5° C. This would necessitate about two changes of water when there was 10° C difference between the external room and the test temperature.

The material used consisted of blood from routine examinations, mostly from chest cases. The bloods were all drawn by me, using no. 20 hypodermic needles, oil-sterilised syringes, and no tourniquet; 2 c.cm. of blood was placed in a tube containing the correct amount of Heller and Paul's mixture or heparin. Up to six different bloods were put up for the test, $^1/_2$–2 hours after collection; the bloods were thoroughly mixed, and a set of tubes was filled at $^1/_2$-min. intervals and placed at 20° C; the same bloods were remixed and then placed into duplicate tubes at the test temperature.

There was, therefore, in each point plotted a strict comparison between the same blood, in the same anti-

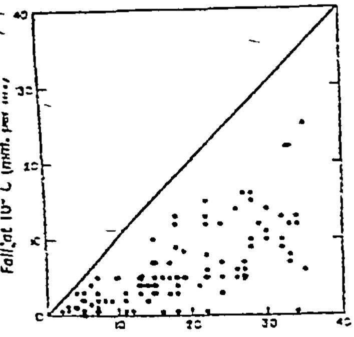


Fig. 3—Comparison of readings at 20° C and 10° C.

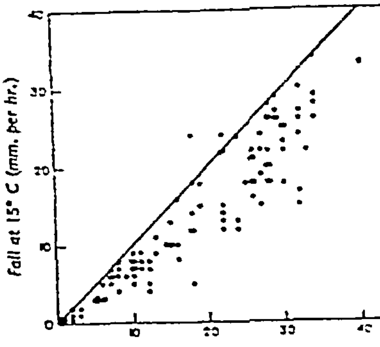


Fig. 4—Comparison of readings at 20° C and 15° C.

coagulant put up in a similar tube but at a different temperature. The fall was recorded an hour after each blood was put up; comparisons were made between the orrected rates, after the bloods had been centrifuged nd corrected by Hyne and Whitby's graph.

Weingarten (1945), using Westergren's technique, has hown that the accelerating effect of high temperature is not constant; that, when liver damage is well marked, a sedimentation-rate test performed at 3·5° C will give a higher reading than will a duplicate test at 38° C. An analysis of the cases used in this investigation is given in the accompanying table. None of the cases would be likely to fit into Weingarten's group III; they would all seem to be in his group I, which is probably the same for most cases in any English hospital.

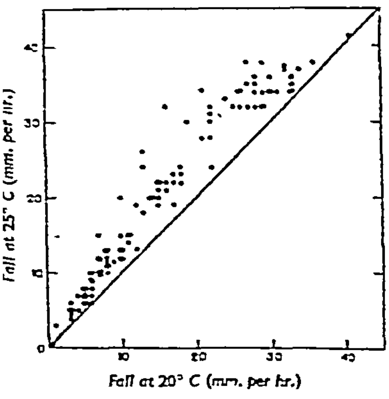


Fig. 5—Comparison of readings at 20° C and 25° C.

RESULTS

Figs. 1–7 show the patterns obtained; they record the results of just over 100 experiments at each temperature. No graphs have been drawn, as it is not desirable that corrections should be attempted; but it would be more useful if a standard temperature was always used. Figs. 3–7 show the effect of varying the temperatures at which the tests are done. The differences are most marked in the middle range; for example, a "slight" could become a "moderate" increase in rate, if the temperature were 5° C higher (20°–25° C). The 10° C chart shows that this temperature provides results that are too scattered, at all increases in rate, to be trustworthy.

TIME TAKEN FOR BLOOD TO REACH TEMPERATURE OF SURROUNDING WATER

A micro-ammeter was connected to a thermocouple kept in an ice-water mixture at 0° C; another thermocouple, in series, was first placed in water at 22° C, then at 32° C, and readings were taken on the ammeter for the purpose of calibration. A Wintrobe tube, with a thermocouple placed down the centre, was filled with blood and suspended in water at 32° C; it was then transferred to water at 22° C, and the time that the ammeter took to equilibrate to the 22° C reading was noted. The experiment was repeated with the tube transferred back to the water at 32° C. The thin type (Baird and Tatlock) Wintrobe tube took an average of 52½ sec. and the thicker (Hawksley) glass Wintrobe tube took 67½ sec. to attain an equilibrium. (It was realised that the type of curve was really asymptotic, but the results are sufficiently accurate for this type of work.) Each result is the average of four experiments.

CONCLUSION

It seems that the experiment of Wintrobe and Landsberg (1935), from which they concluded that there was no significant effect of temperature betwen 22° C and 27° C, gave a wrong impression, and that a rise from 22° C to 27° C has very appreciable effects. In their paper giving a correction graph for varying corpuscular volumes Hynes and Whitby (1938) do not mention the temperature, but Whitby and Britton tell me that this work was carried out in winter, without temperature being recorded or controlled. From the above results it appears that their average temperature was probably about 18° C; this is at variance with Whitby and Britton (1944) who suggest performing the tests at temperatures between 22° C and 27° C; this range is both too high and too wide.

The ranges of temperature experienced in this laboratory are probably very similar to those in sanatoria, and it is desirable that the temperature at which the tests are carried out may be controlled in the future. Often a test is set up in the ward, which is well ventilated; hence in winter the temperature will be very near 10° C, a temperature at which results are untrustworthy. This will explain the results quoted by Edwards and Cuttrill (1942) who urge the use of a standard temperature.

SUMMARY

A method has been devised of keeping sedimentation tubes at a controlled temperature by suspending them in a container of water. The use of only one constant temperature is desirable.

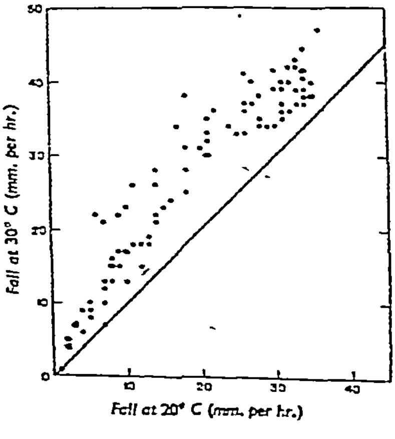


Fig. 6—Comparison of readings at 20° C and 30° C.

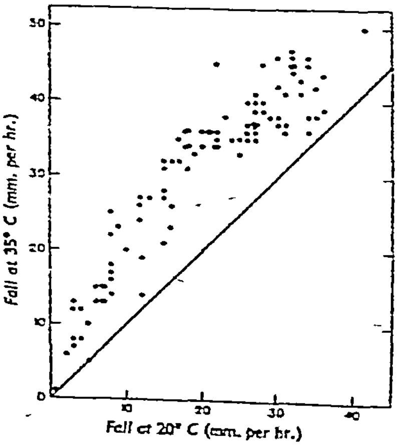


Fig. 7—Comparison of readings at 20° C and 35° C.

In the cases investigated (in England) variation in temperature affected the sedimentation-rate, increased rates being recorded with rises in temperature. Temperatures below 15° C should never be used.

I wish to thank Mr. E. W. Switzer, of Shotley Bridge, who produced the original holders; Messrs. Willen Bros. Ltd., for making the holders; Sir Lionel Whitby and Dr. C. J. C. Britton for help and advice; my colleagues in this hospital for their coöperation; and Mr. L. B. Holt, who supplied the apparatus and advised in the experiments using the microammeter.

REFERENCES

Edwards, P. W., Cuttrill, L. J. (1942) *Brit. med. J.* ii, 379.
Hynes, M., Whitby, L. E. H. (1938) *Lancet*, ii, 249.
Nichols, R. E. (1942) *J. Lab. clin. Med.* **27**, 1317, 1410, 1569; **28**, 75.
Rogers, K. B. (1946) *Lancet*, i, 502.
Rourke, M. D., Ernstene, A. C. (1930) *J. clin. Invest.* **8**, 545.
Weingarten, R. J. (1945) *Lancet*, ii, 526.
Westergren, A. (1921) *Brit. J. Tuberc.* **14**, 94.
Whitby, L. E. H., Britton, C. J. C. (1944) Disorders of the Blood, London.
Wintrobe, M. M., Landsberg, J. W. (1935) *Amer. J. med. Sci.* **189**, 102.

TREATMENT OF YAWS WITH PENICILLIN

K. R. Hill
M.B. Lond.
LATE O.C. MEDICAL RESEARCH UNIT, WEST AFRICAN COMMAND

&

G. M. Findlay
C.B.E., M.D., D.Sc. Edin.
LATE CONSULTING PHYSICIAN, WEST AFRICAN COMMAND

A. Macpherson
M.B. Edin.
MEDICAL OFFICER, WEST AFRICAN MEDICAL STAFF

The original observations of Mahoney et al. (1943) on the curative action of penicillin in syphilis have now received ample confirmation. Comparatively few investigations, however, have been made on the action of penicillin in yaws.

In a preliminary communication from West Africa, Findlay et al. (1944) recorded results obtained with penicillin in 24 cases of primary and secondary yaws. Whitehill and Austrian (1944) reported the successful treatment of 17 cases in Fiji, da Cunha et al. (1944a and b) 12 cases in Brazil, and Logfren (1944) 1 case in a European. These observations showed that *Spirochæta pertenue* is highly susceptible to penicillin; the period of observation, however, was in all cases short.

In the present communication, in addition to the 24 cases originally described (Findlay et al. 1944), of which 20 were followed for considerable periods, 104 further cases are discussed. The patients were all African children or mothers belonging to various tribes.

TECHNIQUE OF ADMINISTRATION

Both sodium and calcium salts were used intramuscularly. With 20,000 units dissolved in saline and injected every three hours for twelve- to twenty-four hours, the primary and secondary lesions rapidly disappeared. Continued observation showed, however, that after two to three months some cases relapsed, as had been noted in syphilitics by Mahoney et al. (1944). A total dosage of 1,000,000–1,500,000 units thus seemed indicated, but a course of three-hourly injections for six or seven days was impossible with African children.

On the appearance of the paper by Romansky and Rittman (1944), suggesting the suspension of penicillin in ground-nut (pea-nut) oil with beeswax, this technique was adopted: 5 c.cm. of sterilised 2% beeswax in ground-nut oil is added to the solid penicillin in the phial, and the mixture is shaken with glass beads for an hour. Despite great care the resulting suspension, at any rate in the tropics, was lumpy. It had to be injected through a wide-bore needle, and the injection caused extreme pain. A second method was therefore tried. The dried penicillin was first dissolved in 1 c.cm. of sterile physiological saline; then 4 c.cm. of sterile beeswax in ground-nut oil was added. On shaking immediately before administration a fine emulsion was produced. One daily injection of 100,000 units was given intramuscularly. This was well tolerated and caused little pain.

CONCENTRATION OF PENICILLIN IN BLOOD AND URINE

Tests on the concentration of penicillin in blood and urine, when penicillin was given by the above two methods, were made both by the slide-cell technique and by the capillary-tube method described by Fleming (1944).

The administration of 100,000 units every twelve hours in beeswax and oil suspension gave a persistent blood concentration of 0·1–0·15 unit, and urine concentrations of 60 units per c.cm. throughout the twenty-four hours. When the same dose was given in an emulsion of saline with oil and beeswax, the blood and urine concentrations were of the same order and only more sustained by two or three hours than those obtained when penicillin was given in saline alone (cf. Fleming et al. 1944).

TIME OF DISAPPEARANCE OF SPIROCHÆTES

In 6 cases of secondary yaws in children, serum from lesions was examined for spirochætes by dark-field illumination. Results are shown in table I. Spirochætes were no longer visible in the lesions nine to twenty-four hours after the start of treatment. Logfren (1944), in his case of yaws in an adult European, found that the spirochætes had disappeared eighteen hours after treatment; Whitehill and Austrian (1944) found them absent after sixteen hours in 16 cases, and forty hours in 1 case.

RESULTS OF TREATMENT

There appeared to be little difference between the clinical results obtained with sodium penicillin and with calcium penicillin; nor, despite the low blood and urine concentrations obtained with the saline and ground-nut oil suspension, did the results appear inferior to those obtained with penicillin in saline alone or in oil suspensions.

The only serious reaction was an abscess in the buttock of one small boy; the pus contained penicillin but yielded a pure growth of *Ps. pyocyanea.* No Herxheimer reactions were observed, though in syphilitics treated with penicillin Mahoney et al. (1944) and Moore et al. (1944) encountered them in 86% and 59% respectively. It must be remembered, however, that African children so constantly have attacks of malaria that they make little of a temperature which would at once send a European to bed.

TABLE I—DISAPPEARANCE OF SPIROCHÆTES

Case	Time of disappearance after treatment (hr.)	Dose of penicillin* (units) up to time of disappearance	Total penicillin* (units) used to complete treatment
18	9	75,000	100,000
19	9	50,000	50,000
21	9	75,000	120,000
58	24	200,000	1,200,000
75	9	100,000	1,300,000
110	24	200,000	1,200,000

* In saline

Primary Cases.—We treated 15 cases of primary yaws; dosage varied from 100,000 to 1,500,000 units. There were 2 failures, though 1 of these cases showed slight improvement in four months. The average time for a clinical cure—that is, the disappearance of the mother yaw—was nine days. Within twenty-four hours there was drying up of the yaw and flattening of the verrucous base, or, in cases where a scab had already formed, pronounced desiccation; within forty-eight hours commencing epithelisation was apparent or desquamation of the scab; in three to six days healing t the lesion was well advanced; by about the ninth ay the site of the lesion was denoted by a grey-brown r pink scar, or, in the case of a thick keratinised surface ike the sole of the foot, by complete restitution of ormal tissue.

Of these 15 cases, 6 were followed up: 4 showed sustained cures, 1 at four months, 1 at five months, and 2 at seven months; 1 case had relapsed at three months but again responded to further treatment and had no relapse five months later; and 1 case, which had appeared to be an immediate clinical failure, was found to be cured when seen eight months later.

In 5 cases the Kahn reaction was reversed; in 2 after one or two weeks, in 1 within four months, and in 2 within seven months of treatment. The first 2 cases had only two or three weeks' history of yaws; the dosage of penicillin was 100,000 units. The other 3 cases were of six weeks' to three months' standing; and, though the Kahn reaction was not reversed three months after treatment, it later became reversed. In 1 case, which had four days' history of yaws and a negative Kahn, there was an immediate clinical cure, which was sustained after a month's follow-up, the Kahn reaction being still negative.

TABLE II—FOLLOW-UP RESULTS IN SECONDARY YAWS

Period of observation (months)	No. surveyed	No. of sustained cures	No. of relapses during this period
1½–3	63	61	2
4 – 6	45	44	1
7 –12	21	21	..

A typical primary case treated with penicillin was as follows.

CASE 1.—A girl, aged 2 years, had two weeks' history of a large primary yaw on the left heel, consisting of an ulcer 1 cm. in diameter, with a fungoid granulomatous base. Kahn and Ide tests both negative. Penicillin sodium, 100,000 units, in beeswax and oil, injected into buttock.

Within twenty-four hours there was drying up of the ulcer and flattening of the verrucous base; at forty-eight hours epithelisation was apparent; and at seventy-two hours healing of the ulcer was well in progress. At six days the lesion was healed, leaving pink scar tissue. A month later cure was found to be sustained. No relapse. Kahn and Ide both negative. No further follow-up.

Secondary Cases.—We treated 96 secondary cases; 81 completed the course, and 78 of these showed immediate clinical cure. The result in 15 cases was uncertain, because immediately after the course of treatment the patients ceased to attend and left the district.

The average time for clinical cure was eight and a half days. The papules desquamated, and the typical yaw scabs dried up and lost their yellow colour within twenty-four hours. Between two and ten days the scabs underwent further desiccation and flaked off, leaving white, pink, or greyish-brown scar tissue at the site of the original lesion.

Table II gives the results of a clinical follow-up over a period up to a year of cases which were originally "immediate clinical cures": 63 cases were followed up to three months, 45 up to six months, and 21 up to twelve months.

On relapse, yaws lesions in new situations were commonly encountered, but also there was often a breaking down at an old site to form a shallow ulcer, which sometimes had a very mixed flora, including on occasions spirochætes and fusiform bacilli; such lesions may therefore have been ordinary tropical ulcers.

Table III gives the results of a serological follow-up over a period up to one year. This survey shows 7 cases with reversal of Kahn out of 40 cases examined, up to a year from the date of treatment.

TABLE III—SEROLOGICAL FOLLOW-UP RESULTS IN SECONDARY YAWS

Period of observation (months)	No. of cases examined	No. of cases with reversal of Kahn	No. of cases with positive Kahn
1½– 3	40	1	39
4 – 6	31*	4	27
7 – 9	19	2	17
10 –12	8	..	8

* Includes one case that had a reversed Kahn reaction at 4 months but a serological relapse at 5 months, though still maintaining clinical cure.

A typical secondary case was as follows.

CASE 2.—A boy, aged 2½ years, had eight months' history of a primary lesion on the inner border of the right thigh and six months' history of multiple secondary lesions. The main sites were chin and neck, abdomen, pubis, perineum, and occiput. Nasal discharge and seborrhœa present. Ide test positive. Spirochætes demonstrated in the yaws in large numbers. Sodium penicillin 100,000 units was given over twelve hours intramuscularly.

Spirochætes disappeared from the yaws within nine hours. Within twenty-four hours the primary lesions had dried up and presented a pink glazed appearance; snuffles ceased. Within forty-eight hours all yaws showed thinning and shrinking of their crusts, and darkening and complete disappearance of the typical yellow colour, the whole giving an appearance of desiccation. Some lesions had already shown separation at the periphery. By six days all yaws had disappeared, leaving either a pale fairly sound skin at the site of the lesion or a grey-brown leathery surface. By ten days there was no evidence of active yaws, and the only stigmata left were the areas of scarring denoting the site of the original lesions. Ide test positive after twenty-one days. Eleven months after the start of treatment the cure had been sustained and there had been no relapse, the Ide test still being positive.

Tertiary Cases.—We treated 17 cases with bone lesions due to yaws: 11 gave immediate clinical remission of symptoms, and almost complete disappearance of osseous signs within sixteen and a half days; 4 showed improvement; and 2 did not respond to treatment at all.

We followed up 6 cases: 2 patients observed at four months, 1 at eight and a half months, and 2 at ten months were in good health. In 1 case there were clinical relapses at six weeks, and at four, seven, and eleven months, but nevertheless the Kahn reaction was negative at the last date.

There were also 2 cases of goundou, which is commonly regarded as a tertiary manifestation of yaws. Neither of them was cured, but 1 had relief from pain and considerable decrease of swelling.

TABLE IV—RESULTS OF TREATMENT WITH ARSENICALS ALONE OR PRECEDED BY ONE INJECTION OF PENICILLIN

Acetylarsol alone			Penicillin and acetylarsol			Neoarsphenamine alone			Penicillin and neoarsphenamine		
Cured	Improved	No change	Cured	Improved	No change	Cured	Improved	No change	Cured	Improved	No change
Secondary											
1	..	4	5	1	..	5	3	1	4	..	..
Tertiary											
3	4	8	9	3	2	11	3	3	12	..	4

Of 2 cases of foot yaws treated, 1 was clinically cured, and 1 showed considerable improvement immediately after treatment, and on examination seven months later was completely healed without any further treatment.

A typical tertiary case was as follows.

CASE 3.—A boy, aged 10 years, had had primary yaws two and a half years ago, and had a week's history of pain and swelling above the left wrist. Kahn and Ide tests positive. He had had tropical ulcers for many years.

April 14, 1945: radiography showed a yaws periostitis at lower end of right radius, with slight medullary rarefaction.

Sodium penicillin in beeswax and oil in daily dosage of 100,000 units was given intramuscularly for fifteen days. The arm was splinted. Within two days the pain subsided.

April 24: clinically much improved, with very little swelling; radiographic appearances showed no extension of lesion, and an area of increased translucency, with cortical erosion and periostitis, in the shaft of the radius 1 in. above the epiphyseal line.

May 5: pain and swelling had disappeared; clinical cure; radiography showed some regeneration of cancellous bone, and less translucency.

June 12: radiography showed a slightly decalcified oval area about 1 in. long in the lower radial shaft, with an associated thin layer of smoothly ossifying periostitis.

August 1: cure clinically sustained; Kahn and Ide tests both positive; radiography showed slight sclerosis and restoration of normal structure in the formerly translucent areas, and periosteum ossified and almost united to cortex.

Thus there was clinical cure after about a week, but radiologically the lesion progressed at one to two weeks, and then steadily retrogressed until, three and a half months afterwards, there was little evidence of former disease.

COMPARISON OF PENICILLIN AND ARSENICALS

To compare penicillin and arsenicals in the treatment of yaws, each of the following treatments was given in a few cases: (1) acetylarsol 1·25 g. daily for fourteen days; (2) one injection of penicillin 100,000 units in oil followed by acetylarsol 1·25 g. daily for fourteen days; (3) three weekly injections of neoarsphenamine 0·6 g.; (4) one injection of penicillin 100,000 units in oil followed by three weekly injections of neoarsphenamine 0·6 g. The results are given in table IV.

The period of observation has been a month; no reversal of Kahn has taken place. Though the series is obviously too small to allow any definite conclusion, a single injection of penicillin followed by acetylarsol seems to be preferable to acetylarsol alone, but with neoarsphenamine the synergic action of penicillin is not in evidence. Of the 62 tertiary cases treated, 11 had yaws ulcers. The result of treatment of the cases with ulcers was as follows:

Treatment	*Cured*	*Improved*	*No change*
Acetylarsol	1	2	1
Penicillin and acetylarsol	2	1	..
Neoarsphenamine	3	..	..
Penicillin and neoarsphenamine	1	..	..

DISCUSSION

In most cases the penicillin dosage consisted of 100,000 units in oil injected intramuscularly once or twice daily, the object being to obtain a continued low concentration of penicillin in the blood, as distinct from the initial peak followed by rapid elimination of penicillin, which is produced by an intramuscular injection of the drug dissolved in saline (Fleming et al. 1944).

McDermott et al. (1945) suggest that, in the treatment of syphilis by repeated doses of penicillin, a minimal effective level need not be maintained absolutely continuously. Intermittent treatment, aimed at obtaining a minimal effective concentration in the blood at intervals corresponding to the growth phases of the spirochæte, would be as efficient. This may well apply to yaws.

Disappearance of the organisms from the yaws lesion does not appear to be influenced by the amount, above a minimal concentration, of the single or the total dosage of penicillin, a fact also noted in syphilis by Moore et al. (1944).

Our results showed that in 12 of 14 cases with primary lesions, and in 78 of 81 cases with secondary lesions, healing took place in an average period of nine and eight and a half days respectively. Out of 17 cases with bony lesions (tertiary), 11 showed complete disappearance of signs and symptoms, and 4 were improved at an early date. Of 2 cases of goundou, 1 showed a slight response and 1 no response at all. The results with penicillin compare favourably with those of other forms of treatment, an important feature being the absence of toxic reactions.

In both syphilis and yaws it is well recognised that, though it is possible to clear up the lesions of the primary and secondary stages with comparative ease, protracted observation is essential if the final results of treatment are to be evaluated. This applies as much, if not more, to yaws. Many African soldiers, for instance, are seen with active tertiary yaws of recent onset who say that years ago they had a series of injections of a yellow fluid into the vein of the arm. It is therefore fully realised that the period of observation of our own cases—and this applies also to all other investigations so far reported on penicillin in yaws—is far too short to allow of final judgment being passed.

In the present series, out of 5 primary cases originally cured and observed during a period of four to seven months, 1 relapsed; out of 45 secondary cases originally cured 3 relapsed during a period of one to twelve months; and during a similar period 1 tertiary case relapsed out of 6.

In yaws there appears to be considerable uncertainty as to how far serological reactions are a significant guide to ultimate cure. In the present series treated with penicillin, the following results were obtained in sustained cures of primary, secondary, and tertiary yaws:

Period of observation (months)	*No. of cases*	*Kahn positive*	*Kahn negative*
1½–3	43	42	1
4 – 6	38	33	5
7 – 9	38	25	13
10 –12	12	11	1

The number of serological reversals was thus small, and it seems that a serologically positive reaction does not necessarily mean lack of therapeutic response. If this is so, serological controls should at the most act as a guide to treatment rather than as a test of permanent cure.

During a short period of observation Whitehill and Austrian (1944) were unable to determine any effect of penicillin treatment on the serum Kahn reaction in yaws, even though the dosage they used was about 1,000,000 units. On the other hand, da Cunha et al (1944a and b), though they used only 9600–54,000 units, claim to have obtained complete reversal of the Wassermann reaction in 8 out of 11 cases, and in a further case the Wassermann reaction was negative at the beginning of treatment and remained negative. No explanation is forthcoming for the different results in the serological reactions obtained in West Africa and Fiji on the one hand, and in Brazil on the other.

A striking result of penicillin treatment has been the change in the granulomatous bone lesions of tertiary yaws. According to Goldmann and Smith (1943), without treatment the osseous lesions of yaws invariably become worse, either with thinning of the cortex and subsequent deformity, or with bone thickening, so that the medulla is encroached on and the line of demarcation between medulla and cortex is lost. This picture may remain unchanged for years or may slowly progress to give the appearance of "marble bone."

As shown radiologically, there is after treatment a very rapid rarefaction of bone, a process which suggests a deterioration, were it not that the clinical signs indicate improvement. This initial rarefaction, which is similar to that observed in penicillin-treated cases of coccal infection of bone, is followed by a rapid formation of normal new bone. Stokes et al. (1944) found that bony lesions in syphilis treated with penicillin healed in from one to six and a half weeks, but they make no mention of radiological control of the healing process. Helfet (1944), in yaws treated with either neoarsphenanine or bismuth and 'Sulphostab,' found relief from pain in the bones in one or two weeks, with some early healing of the osseous lesions in six weeks. Our experience of the osseous lesions of tertiary yaws treated with 'Sobita' or with neoarsphenamine indicates a much slower period of healing than with penicillin.

At this stage it would be foolish to compare the permanent results of penicillin treatment of yaws with those obtained with such drugs as neoarsphenamine, acetylarsol, and sobita, but penicillin clearly has some advantages over bismuth and the arsenicals. The rapidity with which the lesions begin to heal is remarkable and has an excellent psychological effect on African patients. The single daily intramuscular injection allows the therapeutic course to be completed in a much shorter time than with either sobita or the arsenicals, an advantage both to those who are giving numerous injections and to the patients, whose attendance is more likely to be regular. Penicillin is far less liable to cause toxic reactions than either arsenical or bismuth preparations. As mentioned previously, Findlay et al. (1944) in one instance found that the lesions of both yaws and of bismuth stomatitis, associated with spirochætes and fusiform bacilli, were rapidly removed by penicillin.

Preliminary observations suggest that acetylarsol and penicillin in combination may act synergically on the spirochætes of yaws, and that penicillin for the acute stage, followed by protracted arsenical therapy, is possibly the ideal treatment if complete and lasting cure is to be attained. Whether, in an area where the possibility of reinfection is by no means remote, it is desirable to effect a radical cure is a problem which requires much fuller investigation.

In the two small villages from which the bulk of our patients were derived there has not appeared any case of primary or secondary yaws in the last five months, suggesting that, if all early cases could be promptly treated and rendered non-infectious, the incidence of yaws in particular areas might be greatly reduced.

SUMMARY

In 128 cases of yaws (15 primary, 96 secondary, and 17 tertiary) treated with penicillin the method of choice was a daily injection of 100,000 Oxford units in groundnut oil and beeswax, up to a total dosage of at least 1,000,000 units.

Spirochætes disappeared from the lesions in 9–24 hours after doses of 50,000–200,000 units.

There was remarkably rapid healing of the acute lesion in primary and secondary yaws, the average times being 9 and $8^{1}/_{2}$ days respectively.

With bony lesions of tertiary yaws considerable success was achieved both clinically and radiologically in a few weeks.

No correspondence could be found in the follow-up investigations between sustained clinical cure and reversal of Kahn reaction.

In 20 cases penicillin was given with either acetylarsol or neoarsphenamine. The results suggest that penicillin in the acute stage, followed by a more prolonged arsenical treatment, is the ideal therapy for ultimate and permanent cure, but further controlled observations are required.

Our thanks are due to Brigadier H. B. F. Dixon, D.D.M.S., West Africa Command, and the Director of Medical Services (Colonial Medical Service), Gold Coast, for permission to publish these observations; and to Dr. O. Ampofo and Mr. A. Kpeglo. Private Amoah, W.A.A.M.C., gave us much assistance.

REFERENCES

da Cunha, A. M., Arêa Leão, A. E., Néry Guimarães, F., Cardoso, H. T. (1944a) *Mem. Inst. Osvaldo Cruz*, 40, 195.
— — — — (1944b) *Ibid*, 41, 247.
Findlay, G. M., Hill, K. R., Macpherson, A. (1944) *Nature, Lond.* 154, 795.
Fleming, A. (1944) *Lancet*, ii, 620.
— Young, M. Y., Suchet, J., Rowe, A. J. E. (1944) *Ibid*, p. 621.

Continued at foot of next column

References continued

Goldmann, C. H., Smith, S. J. (1943) *Brit. J. Radiol.* 16, 234.
Helfet, A. J. (1944) *J. Bone Jt Surg.* 26, 672.
Logfren, R. C. (1944) *Nav. med. Bull., Wash.* 43, 1025.
McDermott, W., Benoit, M., DuBois, R. (1945) *Amer. J. Syph.* 29, 345.
Mahoney, J. F., Arnold, R. C., Harris, A. (1943) *Amer. J. publ. Hlth*, 33, 1387.
— — Sterner, B. L., Harris, A., Zwally, M. R. (1944) *J. Amer. med. Ass.* 126, 63.
Moore, J. E., Mahoney, J. F., Schwartz, W. H., Sternberg, T. H., Wood, W. B. jun. (1944) *Ibid*, p. 67.
Romansky, M. J., Rittman, G. E. (1944) *Bull. U.S. Army med. Dept.* no. 81, p. 43.
Stokes, J. H., Sternberg, T. H., Schwartz, W. H., Mahoney, J. F., Moore, J. E., Wood, W. B. jun. (1944) *J. Amer. med. Ass.* 126, 73.
Whitehill, R., Austrian, R. (1944) *Bull. Johns Hopk. Hosp.* 75, 232.

THE USES OF PLASTICS IN SURGERY

GEORGE BLAINE
M.D. Berlin, L.R.C.P.E.
MAJOR R.A.M.C.; LATE OF THE DIRECTORATE OF BIOLOGICAL RESEARCH, WAR OFFICE

IN the last few years plastic chemistry has developed a number of new materials and has shown that many biochemical substances possess plastic properties which can usefully be applied in surgery. Most of the fundamental and pioneering applied work has been done in Great Britain and in North America.

Since instruction in plastics is not included in the medical curriculum, a summary of their salient characteristics is a necessary preliminary to a survey of their place in surgical practice.

Plastics are chemical substances of high molecular weight. They are deformable (mouldable) under suitable conditions and retain their acquired shape thereafter in a normal environment. They are versatile in that the end-product of the plastic process can be given different physical properties. For instance, some plastic might be made into a moulded ivory-hard object, a flexible rubbery mass, a thin adhesive film, a yarn that might be woven into fabric, or a highly porous spongy or foam-like structure. Provided they fulfil the requisite criteria of surgery they can be used in place of existing materials, and in some cases they make new surgical procedures possible.

Plastics can be grouped according to their physical and chemical behaviour and divided into absorbable and non-absorbable materials according to their interaction with living tissue (Blaine 1945a). The accompanying table gives the facts of interest to the surgeon.

SPECIAL APPLICATIONS

In *bone surgery* plastic materials have been used for filling gaps in the cranial vault and facial bones. Acrylics have been found most useful for this. After animal experiments had proved the harmlessness of polymethyl methacrylate in trephine holes of the cranium of the cat (Blaine 1946a) and rabbit (Beck et al. 1945), Small and Graham (1945) reported 30 cases in which acrylic obturators had been used in filling cranial defects. Shelden et al. (1944) used entire acrylic "cranial vaults" in investigations on shock in monkeys. A good description of the current "dental" technique of use of acrylics is found in both these papers.

Attention has to be drawn to the late behaviour of acrylic plates in bone gaps. Sometimes the plate, quiescent for six months or more, has become loose and worked its way to the surface (Blaine 1945b). This was more likely to happen where transplanted skin was used to provide skin cover; experimentally it happened regularly where the bulk of the implant caused tension in surrounding tissue and possibly interfered with vascularisation. I have seen two cases where acrylic plates were used in covering defects after operations on the frontal sinus; in one case the plate was firm for three years before it became loose; it could be moved about under the skin but it caused otherwise no discomfort. There was no tendency in this case for the plate to "work itself out."

Acrylics are currently used with the "dental impression" technique. Many excellent descriptions, with as many individual modifications, are available, and two have been referred to above. The use of this method demands the assistance of trained dental mechanics and necessitates a two-stage operation: in the first stage the impression of the gap contour is taken; in the second the finished prosthesis is fitted. The use of this technique is an obvious drawback and provides, in comparison with tantalum, the advantages of radiolucency and cheapness only; many brain surgeons consider it more complicated than the fashioning of a bone graft to the gap.

Two methods have been described and demonstrated (Blaine 1945a) which permit the use of acrylics in one stage. The one makes use of ultraviolet-ray acceleration of polymerisation (setting) of "activated" acrylic dough, formed in situ; the other method makes use of the "thermoplastic" properties of preformed unplasticised methyl methacrylate sheet. This sheet when heated to 130° C becomes readily mouldable and soft to handle. Pressed to a model it takes the exact shape of the "master" and retains this acquired shape on rapid cooling. Either of these methods enables methyl methacrylate to be used in a short time, say 15–20 min. A detailed description of the methods is given elsewhere (Blaine 1946a). Another simplified in-situ process has since been developed and will be described shortly.

Harmon (1943) described the use of acrylic "joint-caps" in the operative treatment of arthritis of the hip and in the reconstruction of the small joints of the hand and foot. Very little has been heard of this application since the first paper on the subject, and it is therefore difficult to evaluate its usefulness in comparison with the metals.

It may be remarked that indifferent and frankly bad results following the use of acrylics in these and other fields might well be due to the purely practical exploitation of acrylics, inevitable in war-time, without due attention to fundamental physiological research; it must be realised that reaction to acrylics varies with the amounts and nature of plasticisers and other added substances which are found in most commercial preparations. Cutler (1946) expressed himself particularly forcibly on this subject, drawing attention to the "mere trickle" of really scientific dental contributions in this specialised subject, as against the spate of technical articles and notes.

In *dental and faciomaxillary work* acrylics are now well established. Many appliances formerly made of precious metal are now made of these plastics, as a routine. Clarkson et al. (1946) summarise the work of the faciomaxillary units in the Central Mediterranean Force; about 90 acrylic Gunning splints were fixed in 45 cases of fracture of the edentulous jaw.

Acrylic splints are enthusiastically recommended (McGowan 1945, Scales and Herschell 1945, Cholmeley 1945) for splinting forearms and wrists, and at the National Orthopædic Hospital at Stanmore a method has been devised for adapting acrylic sheet for use as a spinal jacket.

At present acrylic splints hardly fulfil all the criteria one ought to apply to new materials replacing old and trusted ones (see Blaine 1945b). However attractive and elegant a plastic splint or appliance looks, its direct moulding to the human frame requires greater heat than the operator's hands and the patient's skin will tolerate; its "indirect" application by the dental method is too complicated; the fact that it does not absorb moisture is hardly as advantageous as has been claimed (McGowan 1945). The plastic splint allows sweat to accumulate; pruritus develops, and the odour of the skin fully counteracts the elegant appearance, lightness, radiolucency, and "washable" nature of the splint. However, in cases where the splint can be removed daily—e.g., in radial nerve palsy—acrylic splints are useful.

I have used acrylic dough (of the commercial type) for splinting a forearm in a patient who volunteered for this treatment. The method consisted of the application of the "kneaded" and "flat-rolled" dough to the limb; the dough could be cut with a pair of scissors. The splinted limb was exposed to the rays of the tropical sun to accelerate the setting of the plastic. Though the result was mechanically excellent, the dough caused acute dermatitis and had to be removed on the second day. Whether specially treated dough would be more satisfactory remains to be seen. Excess monomer was probably responsible for the dermatitis.

Before any plastic is recommended to replace plaster-of-paris in orthopædic splinting, it is well to bear in mind that it would have to possess the following properties: cheapness; foolproof handling: quick setting without complicated machinery; and porosity. Were these added to the existing properties of plastics—radiolucency, lightness, elegance, and the fact that they allow the patient to wash and bathe—the plastic splint or spinal appliance would come to stay.

OPHTHALMOLOGICAL USES

Contact lenses and artificial eyes made from acrylic plastics do not break easily, but they are easily scratched, and their cost is relatively high (Stewart 1946).

Flexible rubber-like plastics of the polyvinyl group are increasingly used as drainage-tubes (Mann 1945) and take the place of rubber on many an anæsthetic airway (Thornton 1944). The tolerance of tissues to polyvinyls varies, however, and it must be remembered that this material is always plasticised and that countless varieties exist. Before these materials are recommended for use, the tolerance of tissues to the different makes will have to be established.

Polyvinyls are also used as soft-tissue prostheses (masks) in plastic surgery. Reports from the U.S.A. (Lougee 1943) and from Australia (Woerner et al. 1945) are encouraging. The polyvinyls are, however, photosensitive and cannot therefore be worn indefinitely (Office of Scientific Research and Development 1943).

In *suture materials* plastic chemistry produced 'Nylon,' the popularity of which makes further comment unnecessary. The reaction of the tissues to it is excellent (Aries 1941); its only drawback is that the material slips, and knots have to be double and tied with great care.

ABSORPTION

The finding that certain plastics were absorbable was perhaps the most important step in the development of plastics for surgical uses. Research was long directed towards the development of absorbable materials for surgery. Used as thin homogeneous films such materials are required to "isolate" healing tissues, thus preventing the formation of adhesions. Amnioplastin, used for some time, was found unsatisfactory by Rogers (1943). Used as carriers of biochemical hæmostatics, such as thrombin, they must facilitate control of capillary oozing. Woven into gauze-like fabric they can control hæmorrhages otherwise difficult to deal with. They can possibly also be used as vehicles for penicillin and thus ensure a more prolonged action. Painted or sprayed over surface wounds and burns they can combine the advantages of the open and closed methods of treatment. *The ideal absorbable material must naturally be sterilisable by heat* and compatible with added substances, and its handling must be simple.

The first practical development was made with oxidised cellulose (Frantz 1943, Frantz and Lattes 1945, Frantz et al. 1946). Suitably treated cellulose (oxycellulose) was woven into gauze and made into film and foam; it was found that it could carry thrombin. Experiments have shown that it was readily absorbable with a

CHARACTERISTICS AND SURGICAL USES OF PLASTICS

Material	Physical form in which used	Tissue reaction	Sterilisability	Uses
ylic (polyethyl meth-rylate)	Processed and moulded plates, dough, and ultra-violet-sensitised dough	Mild fibrous reaction to all physical forms; no giant cells; some solvents—e.g., acetone—irritant	By heat and pressure; plasticised material undergoes some deformation	Cranial and faciomaxillary obturators, plates; external prostheses
ulose acetate	Flexible films	Massive fibrous tissue formed around implant (Graef and Page 1940)	By heat and pressure	Experimentally for producing "armour plating" round kidney and blood-vessels
thyl cellulose	Solution	Not tested	By heat and pressure	Experimentally as plasma substitute
olyamide ('Nylon')	Filament yarns, solid plates	Mild fibrous reaction; no giant cells	By heat and pressure	Suture materials; experimental bone plates and screws
ea and phenolic resins	Resin, for coating and moulding cloth	The resins are highly irritant	Sterile	Experimentally as splints
olyvinyl chloride	Flexible sheets, tubes, blocks	Variable reaction depending on added materials	By heat and pressure	Drainage-tubes, airways, facial prostheses
olyvinyl alcohol	Solution	Not tested	By heat and pressure	Experimentally as plasma substitute
asein	Solid rods, blocks, film-forming emulsions	Transient aseptic inflammation during absorption	Deforms on heat-treatment unless specially packed	Experimental bone plates and screws; films in treatment of burns
ibrin and fibrinogen	Solid blocks, foam, film; with thrombin "in situ" formed clots	ditto	By formalin treatment only; not sterilisable by heat	Tissue-isolating films, cover of dural defects, hæmostasis
elatin	Porous elastic "sponge"	ditto	By heat and pressure	ditto
xycellulose ..	Woven fabric as gauze, cotton-wool; solution	ditto (less highly oxidised material creates fibrous reaction)	By formalin treatment only	ditto (also experimental plasma substitute)
Alginates ..	Woven fabric as gauze, cotton-wool, film, foam sponge; solution of sodium salt with $CaCl_2$ for "in situ" clotting and plasma clotting	Mild aseptic inflammation in course of absorption	By heat and pressure	ditto

comparatively minimal tissue-reaction. Clinical use was made of it in neurosurgery; it was satisfactory as a thrombin carrier and controlled capillary hæmorrhage in brain surgery. In general surgery it was used to control hæmorrhage from highly vascular organs. Drawbacks of this material are that it cannot be sterilised by heat and is incompatible with penicillin, reducing the potency of the drug. It destroys penicillin preparations.

PROTEIN PLASTICS

About the same time when the uses of oxycellulose were published it was found, almost simultaneously in the U.S.A. (Ingraham and Bailey 1944, Bailey and Ingraham 1944) and in Britain (Blaine 1945a), that proteins possessed suitable plastic properties.

Fibrin.—In course of plasma-protein fractionation experiments at Harvard Medical School and elsewhere fibrin was particularly experimented with in this connexion. Fibrin was made into film and foam and into a sprayable solution. Used in covering dural defects the film was found highly satisfactory (Ingraham and Bailey 1944, Bailey and Ingraham 1944). As a foam in combination with thrombin it proved of great help in arresting capillary hæmorrhage. Sprayed on burns and clotted with thrombin it was also useful.

Drawbacks to the ubiquitous use of fibrin (or fibrinogen) plastics are their non-sterilisability by heat and the relatively complicated and expensive method of their production. Used experimentally in the treatment of scleral wounds (Blaine et al. 1944) it was found too quickly absorbable, though it fulfilled the other criteria admirably. Workers in the U.S.A. reported persistence of fibrin film for about 80 days over the dura (Ingraham and Bailey 1944).

Casein.—In Britain the protein-plastic experiments were mainly directed towards the development of solid plastic appliances as plates and screws for the internal fixation of fractures (Blaine 1945a, 1946a). Though the initial physical properties of *casein* plastic—the protein predominantly used—were promising, such plastic softened in tissue too early to be of use.

Casein plastic films formed in situ were used by Curtis and Brewer (1944) for burns. Their results speak well of this method.

Gelatin.—Light and Prentice (1945) described the use of gelatin plastic sponge, 'Gelfoam,' as a thrombin carrier. The easy handling and availability of the material makes it a very promising foam in hæmostasis.

Alginates.—The latest development in absorbable plastics to be used as a tissue isolator, absorbable gauze, cotton-wool, and a "carrier" of added substances in the form of a foam, film, or gel is the adaptation of alginate products to surgery (Blaine 1946b). These are a derivative of seaweed; though not generally known and developed as a plastic, certain of its salts possess plastic properties.

Evidence has been presented that certain alginate products are absorbable in tissue, sterilisable by heat, and compatible with penicillin (Blaine et al. 1944, Blaine 1946b). Used (also in combination with plasma as an alginate-plasma film) as "puncture patches" over scleral defects, alginate film was found satisfactory both experimentally and clinically (Blaine 1946b). There is, however, no further report of its use in this connexion in this country. Alginate films clotted in situ with calcium chloride (the quick clotting of the sodium alginate solution under the action of calcium chloride is particularly noteworthy) were used by me in the treatment of wounds and burns in troopship hospitals in the Far East. Results were very encouraging, but lack of facilities and "exigencies of the Service" made it unpractical to follow up the cases methodically. The same holds good for penicillin "carriage" experiments.

Gough (1945), in the National School of Medicine in Wales, reported the usefulness of alginate gels in the sealing of bronchi in the surgical treatment of pulmonary tuberculosis.

PLASTIC SOLUTIONS

Experimental use of plastic solutions was made in the search for plasma substitutes in blood-transfusion. Sodium alginate (Solandt 1941), methyl cellulose, and polyvinyl alcohol (Roome et al. 1944) were reported on in this field of research. Polyvinyl alcohol alone showed sufficient promise. Roome et al. (1944) in Canada found that it was well tolerated by patients.

CONCLUSION

It will be seen that a considerable amount of work was carried out, mostly under the stimulus of war-time needs of surgery, in this newest field of experimental surgery. Further research might produce many a useful innovation. One factor must be borne in mind. The plastic industry is not ancillary (like the pharmaceutical industry) to the medical profession. Stimulus for further work in these fields must therefore come from the surgeon.

REFERENCES

Aries, L. J. (1941) *Surgery*, **9**, 51.
Bailey, O. T., Ingraham, F. D. (1944) *J. clin. Invest.* **23**, 591.
Beck, D. J. K., Russell, D. S., Small, J. M., Graham, M. P. (1945) *Brit. J. Surg.* **33**, 83.
Blaine (Blum), G. (1945a) *Proc. R. Soc. Med.* **38**, 169.
— (1945b) *Brit. Plastics*, **17**, 331.
— (1946a) *Brit. J. Surg.* **33**, 245.
— (1946b) *Ann. Surg.* September.
— Dollar, J. M., Sorsby, A. (1944) *Trans. ophthal. Soc* **64**, 187.
Cholmeley, J. A. (1945) *Brit. med. J.* ii, 585.
Clarkson, P., Wilson, T. H., Lawrie, R. S. (1946) *Ann. Surg* 190.
Curtis, R. M., Brewer, J. H. (1944) *Arch. Surg., Chicago*, **48**, 1
Cutler, R. (1946) *Proc. R. Soc. Med.* **39**, 103.
Frantz, V. K. (1943) *Ann. Surg.* **118**, 116.
— Lattes, R. (1945) *J. Amer. med. Ass.* **129**, 798.
— et al. (1946) *Bull. N.Y. Acad. Med.* **22**, 102.
Gough, J. (1945) personal communication.
Graef, I., Page, I. H. (1940) *Amer. J. Path.* **16**, 211.
Harmon, P. H. (1943) *Modern Plastics.*
Ingraham, F. D., Bailey, O. T. (1944) *J. Neurosurg.* **1**, 23
Light, R. U., Prentice, M. R. (1945) *Arch. Surg., Chicago*, 5 69.
Lougee, E. F. (1943) *Modern Plastics*, **21**, 80,
McGowan, A. (1945) *Brit. Plastics*, **17**, 30.
Mann, S. (1945) *Brit. med. J.* i, 84.
Office of Scientific Research and Development, Washington (19 Monthly Report no. 13.
Rogers, L. (1943) *Brit. med. J.* i, 423.
Roome, N. W., Ruttle, L., Williams, L., Smith, W. (1944) *Canad. med. Ass. J.* **51**, 293.
Scales, J. T., Herschell, W. (1945) *Brit. med. J.* ii, 423.
Shelden, C. H., Pudenz, R. H., Restarski, J. S., Craig, W. M. (194 *J. Neurosurg.* **1**, 67.
Small, J. M., Graham, M. P. (1945) *Brit. J. Surg.* **33**, 106
Solandt, O. M. (1941) *Quart. J. exp. Physiol.* **31**, 25.
Stewart, F. J. (1946) *Proc. R. Soc. Med.* **39**, 251.
Thornton, H. L. (1944) *Brit. med. J.* ii, 14.
Woerner, H. K., et al. (1945) *Aust. dent. J.* **1**, 28.

Medical Societies

TUBERCULOSIS ASSOCIATION

AT a meeting in London on Sept. 20, with Dr. NORMAN TATTERSALL, the president, in the chair, a paper on

Tuberculosis of the Nervous System

was read by Dr. HONOR SMITH. She said that while there are powerful new weapons against purulent meningitis, the tuberculous form is still as great a therapeutic problem as when Whytt first described it in 1768, though hopes are now raised by streptomycin.

Apart from Pott's disease, there were two types of infection—meningitis and the much rarer large tuberculoma. The latter presented as an expanding lesion, with raised intracranial pressure and localising signs; the diagnosis was from tumour or abscess, and though tuberculosis elsewhere was a pointer, biopsy was sometimes necessary for diagnosis. Radiological evidence of calcification was not pathognomonic; it was, for example, seen with gliomata. Removal of a tuberculoma did not necessarily result in tuberculous meningitis; of 6 cases operated on at the Nuffield Department of Surgery, Oxford, 4 had recovered completely. A simple decompression might suffice, especially with cerebellar tuberculomata.

Tuberculous meningitis was said by Rich and McCordock to result from rupture of a tuberculous focus into the ventricles or subarachnoid space. Dr. Smith said she had found small tuberculomata with meningitis, but their piecemeal removal did not inevitably result in meningitis. Of 25 cases of tuberculous meningitis, rather more than half were over ten years of age. The insidious prodromal phase might be due to concomitant miliary tuberculosis rather than to meningeal involvement. The stages of nervous involvement were as follows:

1. *Meningeal Irritation.*—This might be absent or hard to detect in infants. There was evidence (O'Connell) that it was due to irritation of the posterior nerve-roots. The site of the exudate might substantially influence the effect of chemotherapeusis.

2. *Signs of Raised Intracranial Pressure.*—Headache was closely paralleled by vomiting. The further increase in pressure at a later stage was usually due to obstructive hydrocephalus.

3. *Mental Changes.*—There might be a change of temperament, succeeded later by delirium, and finally stupor or coma.

4. *Epilepsy.*—When this occurred it was usually at the end of the prodromal phase and was focal or jacksonian.

5. *Focal Signs.*—These might include ophthalmoplegia, extensor plantar responses (often unilateral), and hemiplegia or paraplegia. They might be caused by tuberculomata, or by vascular occlusion and infarcts. Chemotherapeusis, to be effective, must act before these vascular changes developed.

The average chloride content of the cerebrospinal fluid (C.S.F.) was 650 mg. per 100 c.cm., as compared with 663 mg. in a series of pneumococcal meningitis; but in half the tuberculous patients the content was less than 600 mg. The chloride level might be depleted by persistent vomiting (as also in pyogenic meningitis) or it might be raised owing to uræmia. The content was usually less than normal, but there was no diagnostic level. Differentiation from pyogenic meningitis might be aided by the discovery of tuberculosis elsewhere in the body and by a positive family history; and a history of a pyogenic focus might cause confusion. Unfortunately, tubercle bacilli could seldom be found in the C.S.F. Ventriculography might show a moderate symmetrical hydrocephalus, which was diagnostic. When the diagnosis was in doubt the condition might justifiably be treated as a pyogenic infection.

Dr. P. DANIELS remarked that the capacity of patients with severe pyogenic meningitis for almost complete recovery after suitable treatment encouraged hope for the successful treatment of tuberculosis of the central nervous system. If an effective drug were found it must be applied early; with complete blockage of C.S.F. circulation the condition became almost hopeless, and the changes with infarction were irreversible, though there might be some improvement with resolution of surrounding œdema.

Treatment of Lupus Vulgaris

Dr. G. B. DOWLING said that lupus, though uncommon, was extremely chronic; there was thus always a pool of affected patients, who constituted a serious social problem. In this country the larger general hospitals bore the brunt of treatment. In Denmark the Finsen Institute treated all cases, numbering, in the ten year between 1914 and 1923, 975, of which 735 were cured, chiefly by local Finsen therapy, carbon-arc baths, heliotherapy, and nutritional remedies; other methods, such as diathermy and cautery, pyrogallol and other caustics, and surgical excision, had also been used. He thought that treatment would be materially helped by intensive vitamin-D therapy, but that there was still need for skilful local treatment.

The first patient treated intensively with vitamin D had had local treatment for five years; he was ordered 150,000 I.U. daily without much confidence in success. The condition was almost cured after $2^{1}/_{2}$ months. There were, however, two relapses, the first within a few weeks with congestion and swelling of the area; moreover, two small lupus nodules embedded in scar tissue were untouched. Between 1943 and 1945 Dr. Dowling d Dr. Prosser Thomas had treated 32 cases: 18 had en cured and 9 much improved. These patients had ceived very little local therapy, in contrast to similar roups treated by Charpy from 1941 onwards. With xic symptoms—nausea, malaise, and sometimes vomit- g—the usual dose of 3 high-potency 'Ostelin' tablets aily might have to be reduced. Hypercalcæmia occurred rratically and was not necessarily associated with toxic ymptoms or improvement of the condition.

Calciferol in Tuberculous Conditions

Dr. D. E. MACRAE described a trial of calciferol in 20 ong-standing cases of lupus vulgaris, in which the verage duration of the disease exceeded nineteen years. f these, 14 had so far been discharged as clear of disease. esults could be summarised as follows: (1) profuse oft granulations, easily removed by scraping, required dditional local treatment; (2) raised firm plaques esponded well; (3) more deep-seated lesions, level with he skin, responded well; (4) isolated nodules responded n the whole badly; (5) with lesions inside the mouth, ose, and larynx the results were mixed; and (6) with multiple areas of affection, the larger the areas the slower the response. During the first 2–3 weeks there was a reaction; patches became angrier and isolated nodules more scarlet, and spontaneous ulcers might develop. Calciferol, he suggested, acted by promoting reaction in the lupus tissue; this resulted in some general toxæmia, as shown by a stronger tuberculin reaction and increased blood-sedimentation rate; and it was succeeded by fibrosis which "literally squeezes the lupus to death." The effect did not seem to be influenced by either the method of administration or by altered calcium metabolism. The addition of local therapy hastened improvement.

He had also observed improvement with calciferol in 2 cases of adenitis, though in these again there was an initial reaction, with softening and pus-formation; and in 1 case of advanced wrist tuberculosis, 1 case of multiple dactylitis, and 1 case of tuberculous cystitis; though these had shown unexpectedly rapid improvement, no precise claims could yet be advanced for calciferol in these conditions.

He had twice seen calciferol treatment complicated by abdominal discomfort and constipation proceeding eventually to coma, peripheral neuritis, and optic atrophy; both patients had ultimately recovered. There had been no evidence of treatment causing renal damage; but calciferol should probably not be given to completely recumbent patients; and the possibility of the initial reaction causing a flare-up necessitated caution where there was active lung disease.

Dr. EMRYS JONES, of Cardiff, said that lupus, usually of long standing, had cleared with calciferol in 16 out of 18 patients. Adenitis also had been cured with this treatment; the periadenitis seemed to clear up first, so that the glands became more discrete.

Dr. M. C. WILKINSON referred to the effect on resistance of increase in the body sterols, and quoted a case of lupus which had cleared up when the patient became pregnant. So far he had not been impressed with the effect of calciferol on tuberculosis of bones and joints.

PRODUCTION OF STREPTOMYCIN.—At a recent press conference held at the London headquarters of Messrs. Boots, Sir Jack Drummond, F.R.S., described the process employed in the manufacture of streptomycin. In the surface-culture method spores of the *Actinomyces griseus* are sprayed on the surface of a medium containing sugar and meat extract or corn steep liquor filled into milk bottles from a conveyor belt (some 250,000 milk bottles are in use). Streptomycin is excreted in measurable quantities after the 7th day, and after 14 days the mould is discarded and the liquor made acid and pumped through charcoal filters which absorb the impurities. After further purification and freeze-drying a white powder emerges which is packed into sterile ampoules. The cost of producing sufficient streptomycin for the three-months course of treatment at present considered necessary for a case of tuberculosis works out, on the basis of American costs, at about £3000, employing the surface-culture process. Messrs. Boots are planning to replace surface culture in bottles by deep culture in huge tanks, and by this process the cost may be reduced to a quarter of the present figure.

Reviews of Books

Abnormal Behaviour

R. G. GORDON, M.D., D.SC., F.R.C.P., late medical director, Child Guidance Council. London Medical Publications. Pp. 75. 5s.

Dr. Gordon writes with the freshness and charm of an acknowledged master, but he spends too many of his 75 pages on going over old ground; consequently, when he comes to the problems of capital and corporal punishment he disposes of them with "it is impossible to go into all the arguments which might be advanced in this complicated problem." This is just the sort of topic, however, about which readers would be glad to see the arguments set out with Dr. Gordon's objectivity. Dealing with the question of punishment, Dr. Gordon sticks to the familiar three purposes—retribution, deterrence, reform—and does not attempt to break new ground. When he comes to the practical issues he writes with good sense and wisdom and makes a convincing case for the psychological attitude. His tolerance, his kindliness, and his obvious soundness must help to win understanding and sympathy for the mentally abnormal.

The Ship Captain's Medical Guide

(18th ed.) Ministry of War Transport, London. H.M. Stationery Office. Pp. 225. 3s. 6d.

NEARLY twenty years have elapsed since the last edition of this venerable publication, and pending a complete revision the compilers have made a determined effort to bring it up to date by rewriting 11 of the 24 chapters and introducing material from *First Aid in the Royal Navy 1943*. The ingenious Neil Robertson stretcher is described in detail, with a series of good photographs to demonstrate its use. The diagrams throughout the book are useful.

Much of the elegant 18th-century English of the original composition, and some of the remedies current at the time, have been retained. The burning of feathers under the nose of the fainting patient is highly commended, and the amount of castor oil and Epsom salts consumed by the patients should keep the ship's lavatory accommodation fully occupied. Any suggestion of heart weakness may be countered by the exhibition of brandy, whisky, or gin at two-hourly intervals, and in the case of the apparently drowned 4 tablespoonfuls are advised as an enema, a pleasure which we must regretfully deny our patients ashore. The style throughout is dogmatic and obviously intended to inspire confidence in the master and his patient. In the background one can almost hear the clanking of irons for any who raise their voices in dissent. We quote one paragraph without comment:

> "PLEURISY. . . . If the patient is robust a tablespoonful of Epsom Salts in just sufficient water to dissolve it should be given every morning. This produces copious liquid discharges and helps to get rid of the accumulation of fluid in the chest by draining it through the bowel."

There is a fine nautical description of appendicitis, commencing with a sudden pain in the south-west corner of the abdomen; but as suspected appendicitis is the biggest bogy facing the unqualified ship's doctor it would be better to rewrite this chapter and say that most cases start with central pain, backing later to south-west, localising, and with the onset of peritonitis veering south and east. McBurney's point is incorrectly described; few surgeons would agree with 4 oz. of milk or liquid nourishment being given every two hours; and the instruction to give a dose of castor oil as soon as the pain and tenderness disappear (when the appendix bursts, for instance) is dangerous.

Since much of the book is concerned with good hygiene, it is odd to find modern fungicides and D.D.T. completely omitted. Penicillin is not even mentioned, though most American ships carry a supply with a purser instructed in its use. All senior officers in our Merchant Navy are required to pass a course in first aid, and it would require little more instruction to enable them to clear up their cases of gonorrhœa with 200,000 units of penicillin or to use the same technique as a life-saver for cases of pneumonia or appendicitis in mid-Atlantic. Where common sense obtains the text is magnificent.

Among the usual anti-shock treatment we find the following splendid advice:

> "CHEER HIM UP. . . . Remember that a casualty is wondering what has happened, whether he is going to live or die and whether, if he lives, he is going to be scarred or mutilated for life. His thoughts are turning in a lonely little personal world of fear, no matter how brave a man he may be. All this mental worry serves to increase his shock and it can be lessened very much by a sympathetic shipmate. Talk to him, be natural . . . and while talking near injured men, never whisper."

We wish all the book was as good as this.

Forensic Medicine

(4th ed.) DOUGLAS KERR, M.D., F.R.C.P.E., D.P.H., lecturer in forensic medicine, School of Medicine, Royal Colleges of Edinburgh. London: A. & C. Black. Pp. 359. 18s.

Douglas Kerr's well-known textbook continues to enjoy the affection and regard of both the student and his teacher. It is so readable, so reasonable, so reliable, and so free from the recondite that ruins many standard textbooks as they achieve success. This fourth edition in some ten years has been augmented with benefit, and new illustrations have been added. References might be better chosen: in toxicology, especially, there is much useful new reading on industrial aspects. The new material—on blood and head injuries in particular—is as clear as the rest. How eminently reasonable it all is, and what sound witnesses we should all be if we digested its principles. The time has come, however, to reduce the references to the pharmacy laws to essentials, and to cut down the sections on artificial respiration and Binet-Simon tests, and the verbatim judgments such as that on Rex v. Savage. And the examiner would have an easier time if the "Schedule to an Order in Council dated April 13th 1937 (S.R. & O. 1937. No. 327)" (sic) were stated, and if no doubts were roused on the gestation at which the law recognises viability. But how little there is in this good book with which to differ. Kerr remains a shining example of clear teaching for the student, readable to a degree.

Food and Nutrition

The Physiological Bases of Human Nutrition. E. W. H. CRUICKSHANK, M.D. Aberd., D.SC. Lond., PH.D. Camb., M.R.C.P., regius professor of physiology in the University of Aberdeen. Edinburgh: E. & S. Livingstone. Pp. 326. 16s.

THE author of this addition to the numerous textbooks on nutrition has in mind medical practitioners, medical students, candidates for the diploma in public health, and sociologically minded laymen. But it is a book with a difference: though the basic science is all there—and well set out—there is much emphasis upon the sociological implications and applications of the science of nutrition. In fact the author introduces the subject with no less than four interesting and valuable chapters on the evolution of human dietaries, the problem of world malnutrition, and the problem of nutrition in Great Britain in 1939–45 and in the coming years. And then, having polished off the science of the subject in six chapters, with three more on foods, he reverts to dietary planning, the appraisal of the nutritional state of individuals and communities, and the Food and Agriculture Organisation. There are numerous digressions into the histories of foods and the science of nutrition for which the author will be both thanked and criticised.

Sciatiques et lombalgies

par hernie postérieure des disques intervertébraux. D. PETIT-DUTAILLIS, professeur de pathologie chirurgicale, Paris; S. DE SÈZE. Paris: Masson. Pp. 178. Fr. 235.

THIS book is a full and straightforward account of the anatomy, pathology, clinical features, and treatment of prolapse of the intervertebral disk, and most of what the authors have to say will meet with general agreement in this country. They emphasise the frequency with which sciatica may be complicated by paralysis below the knee; and they use intrathecal iodised oil as a routine in diagnosis, where we have learnt to do without it. Their operative approach is a full laminectomy done under local anæsthesia, and the extradural removal of the prolapse is supplemented by division of the sensory root on both sides at the level of the lesion.

Pathology of the Central Nervous System

(2nd ed.) CYRIL B. COURVILLE, M.D., professor of nervous diseases, College of Medical Evangelist, Los Angeles. London: H. K. Lewis. Pp. 450. 36s.

THE second edition of this book has been somewhat expanded to include recent work on problems of the circulation, infection, and some neoplastic and degenerative diseases. Special attention is paid to the effects of trauma and bony diseases of the cranium and spine. Rather more space might have been given to the important subject of the virus infections, and more might with advantage have been said about the postexanthematous demyelinating diseases and their relationship to disseminated sclerosis. The presentation is clear and the micro- and macro-photographs and diagrams are well chosen and reproduced. The book is comprehensive and well written, and lays a sound foundation in neuropathology for the student of neurology or general medicine.

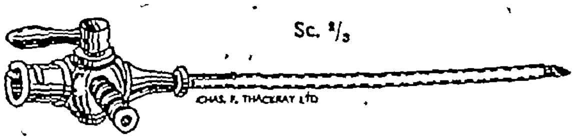
New Inventions

NEEDLE AND CANNULA FOR CHEST EXPLORATION

ONE of the dangers associated with the aspiration of the pleural space is spontaneous pneumothorax. It is not perhaps a very common one, but experience on a thoracic surgical unit, where aspiration is an everyday occurrence and forms a major part of treatment, shows that it is sufficiently common, in spite of the most careful technique, to justify efforts to reduce its incidence to a minimum.

The danger lies in the penetration of the lung with the large aspirating needle used, but this alone need not necessarily give rise to spontaneous pneumothorax. The latter is far more likely to develop as the result of unnecessary manipulations of the needle when the pleural space has been entered, and it should be the main rule in chest exploration to avoid these manipulations.

The special needle (incorporating a two-way attachment) described below and in the accompanying diagram was devised with a view to minimising this danger, and has been used extensively in the thoracic surgical unit at Harefield with good results.



Essentially, the instrument consists of a cannula into which a large-bore needle is fitted closely enough to avoid leakage of air and yet allowing the needle to slide freely within the cannula. A guiding pin, firmly attached to the shaft of the needle, fits into a slot at the base of the cannula. The slot is arranged in the following way:

1. When the cannula is pushed right home, preparatory to aspiration, the needle point protrudes from its distal end.
2. When the pleural space has been entered, the needle point may be withdrawn into the cannula, and a small side extension of the slot allows the needle to become locked in this position.
3. If necessary—e.g., for cleaning—the needle can be removed from the cannula.

The advantages of this needle are as follows:

1. Once it is in the pleural space, the needle point can b withdrawn into the cannula, thus considerably reducin the likelihood of trauma to the lung.
2. The cannula protects the point of the needle when not i use, particularly when it is being boiled.
3. The incorporation of the two-way tap reduces th possibility of an air leak at the junction.

The only disadvantage appears to be the size of the needle, which is necessarily large, though not unduly so.

I wish to thank Mr. E. Blackburn, of Chas. F. Thackray Ltd., for his assistance and advice on the manufacture o the instrument.

E. V. MEDILL, M.R.C.S.

Harefield County Hospital, Middlesex.

There is considerable evidence of the outstanding value of Cardophylin in producing vasodilatation. The coronary vasodilatation is manifested in an increased coronary blood flow and a beneficial effect on the myocardium; the renal vasodilatation is indicated by the powerful diuresis, while its antispasmodic action appears to be largely the result of the bronchodilatation induced by the drug.

Cardophylin

A SPECIALLY PREPARED COMPOUND OF THEOPHYLLINE-ETHYLENEDIAMINE

INDICATIONS

DISEASES OF THE CARDIOVASCULAR SYSTEM • OEDEMA • ASTHMA

★

LITERATURE AND SAMPLES ON REQUEST

IN TABLETS FOR ORAL USE, AMPOULES AND SUPPOSITORIES

MANUFACTURED BY

WHIFFEN & SONS LTD • CARNWATH ROAD
FULHAM • LONDON • S.W.6

'SVC' Trade Mark Brand **Acetarsol Vaginal Compound**

M&B

The presence of trichomonads in cases of vaginitis is not always apparent when ordinary methods of examination are employed, but they are so frequently associated with intractable leucorrhoea that the use of 'S.V.C.' may be justified without actual microscopic confirmation.

TECHNIQUE FOR TABLETS

Where there is marked inflammation of the vaginal walls, a preliminary alkaline douche is given followed by the insertion high up into the vaginal fornices of 2 to 4 tablets of 'S.V.C.' At first this should be done twice daily but gradually the insertion of the tablets is reduced in frequency until finally they are given only on the days immediately following the menstrual period.

TECHNIQUE FOR POWDER

The vagina is wiped dry and painted with a 1 per cent. solution of gentian violet. After this has been allowed to dry for a few minutes the contents of a container of 'S.V.C.' powder are blown into the vagina by means of a powerful powder blower the action of which balloons the vagina, allowing the powder to be deposited in every fold and crevice.

Treatment is given daily or every second day. During menstruation twice the amount of powder should be employed. Insufflation is contraindicated during pregnancy.

ELONGATED TABLETS
Bottles of 12 and 25.

POWDER
Containers of 6 x 6 grammes.

MANUFACTURED BY

MAY & BAKER LTD.

DISTRIBUTORS

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM

9035

STANDARD PRODUCTS in EPILEPSY

'LUMINAL' was the original phenobarbitone. Of prime importance in epilepsy, its value is recognised in many other indications, including neuroses, pruritus, migraine, insomnia.

'PROMINAL' has a fit-reducing effect at least equal to that of 'Luminal,' toxicity is 30% lower and hypnotic effect is minimal. It is particularly indicated in those milder cases where maintenance of "employability" is an important factor.

Supplied in tablets of various dosages.
Literature available upon request.
('Luminal' and 'Prominal' are Trade Marks).

BAYER PRODUCTS LTD · AFRICA HOUSE · KINGSWAY · LONDON W.C.2

THE LANCET

LONDON: SATURDAY, OCT. 12, 1946

Nuremberg

History, contemporary or otherwise, may be onceived as a series of dramatic and important appenings, such as wars, separated by intervening eriods which are undramatic and unimportant. his way of looking at human affairs is taught in chools because it is easy, and encouraged by newsapers because it is exciting; but it leads to bewildernent when the course of events does not take so imple a form. A different view of history, though it nvolves the acceptance of some painful ideas, will ead to less bewilderment. On this alternative view he movement of individuals and of groups, even ations, is determined not by their intrinsic character but by the field of forces of which they are a part; their individual volition, if it exists at all, is less significant, in the shaping of their destinies, than the total of forces which moves them. The Aristotelian notion that a stone falls because it is in its nature to go towards the earth gave place to Galileo's and Newton's idea that the stone falls because it is influenced by the forces in the field: and in the same way, in human affairs, we must look to the total pattern before we can understand the movement of a part. On this basis one may look on wars and the intervening periods of peace as phases of human adjustment, both having ultimately the same purpose. This purpose is to achieve a situation of looser tension —to redistribute the forces of constructiveness and destructiveness so that eventually a condition of less danger to valued objects may be established. For the preservation of loved persons and loved ideals is central to any rational consideration of human affairs.

The Nuremberg trial of a score of ageing malefactors and the impeachment of a few disgraceful political organisations can be looked at from two quite different angles. The opinion which has been generally expressed is that it represents a stage in the gradual extension of the range of law; it is a demonstration that, even though the resentment of having been dragged into war is still strong, the principles of fair play are dominant in the victors; and even if it sets higher international standards than the victors always themselves observe it is at least a statement of the moral principles to which they aspire—a statement which may be justified by their future behaviour. True though all this may be, however, it is certainly not the whole truth. Perhaps more fundamentally, the Nuremberg trial may also be regarded as a theatre of operations where the victors came together and worked through their states of tension and mistrust. It too is part of the technique of post-war adjustment, and for this reason no less than the other has potential value. Nobody can now assess this value, though it is easy to suffer illusions about it. On the one hand it is reassuring that the governments can treat abominations in international affairs as they treat crimes in their domestic affairs; on the other hand, law-courts however fair, and sentences however just, do more to assuage the ruffled feelings of the community than to remove the cause of crime.

The victorious nations were a team forced together by a common external danger; they were far from being united, and it would be a foolish act of misbelief to imagine that they were. Profoundly conflicting views as to the way social life should be lived are held by the parties to the peacemaking; there is mutual suspicion, mistrust, and hostility—all the more disquieting when the nations are so explosively armed and when the techniques for reducing tension otherwise than by arms are so poorly integrated into the structure of international life. Nevertheless these techniques exist: there are today many theatres of adjustment where stresses of conflict can be worked out, and the various conferences of foreign ministers, Uno, Unesco, and others serve as outlets of aggression and means of acquiring experience of distrusted people. A conference that ends in discord may seem a disaster but may rather be a valuable cathartic; whereas a trial which ends in unanimity may be a soporific. We cannot judge: indeed most of us can now do nothing except observe the course of events. But we shall do more for the cause of constructiveness and cohesion if we try to keep in mind the whole agony of the world than if we dream, or even hope overmuch, that the condemning of conspicuous criminals is a measure of the world's unity.

Our unity as allied nations was greatest when the common foe was pressing hardest. What common enemy threatens us now? None perhaps is greater than despair over the settling of our own internal difficulties, and the weakness of our methods of dealing with tensions within our groups and with our individual disquiet.

Twenty Years of Typhus Research

Those who were young a quarter of a century ago are apt to compare the present age unfavourably with the years which succeeded World War I. Whatever enchantments distance may lend to the political scene there is no doubt that medically we are now far better equipped with knowledge of how to deal with menaces to life and health than we were in the early twenties. This was clearly brought out by Prof. Hermann Mooser[1] in his address to the British-Swiss Medical Conference on progress in typhus research.

Twenty years ago almost all that was known of the rickettsial infections was that typhus was transmitted by lice, a fact discovered by Nicolle, Comte, and Conseil[2] in 1914, and that Rocky Mountain spotted fever and tsutsugamushi disease were distinct specific infections with their own epidemiological peculiarities. Names like tick typhus, Saõ Paulo typhus, summer typhus, pseudotyphus of Delhi, tropical typhus, scrub typhus, shop typhus, Manchurian typhus, and mild endemic typhus were indiscriminately applied to febrile diseases for which no specific classification was available. The first step in resolving this confusion was the differentiation of flea-borne or murine typhus from the epidemic

---

1. Mooser, H. *Schweiz. med. Wschr.* 1946, 76, 877.
2. Nicolle, C., Comte, C., Conseil, E. *C.R. Acad. Sci., Paris*, 1914, 159, 661.

or louse-borne variety. MOOSER's account of how this was accomplished differs somewhat from that usually accepted. Doubts as to the louse being the sole insect vector of typhus were first raised in 1923 by JOSÉ TERRÉS[3] in Mexico, where the disease had been endemic and occasionally epidemic from shortly after the Spanish conquest. Since the local population was heavily infested with lice it was difficult to disprove the louse transmission theory in Mexico. A series of mild cases, however, was recorded by SINCLAIR and MAXCY,[4] from the American side of the Rio Grande valley, where the rarity of *Pediculus humanus* var. *corporis* made it unlikely that that insect could act as an effective vector. Previously HONE[5] in Australia had observed cases of typhus in Adelaide in 1922 and 1923 among persons handling wheat and other foodstuffs, while WHEATLAND,[6] another Australian, connected his cases of mild typhus with a migration of mice, associated with an epizootic. WHEATLAND went so far as to give the name "mouse fever" to the disease from which his patients suffered, though they all had positive Weil-Felix reactions. In 1924 FLETCHER and LESSLAR[7] had observed in the Federated Malay States cases of what they called tropical typhus where there was no evidence of man-to-man transmission but the possibility of contamination from rats was high. In 1925 MOOSER[8] obtained a strain of typhus in guineapigs inoculated with the blood of a patient from Mexico City; this and subsequent strains produced a scrotal reaction in male guineapigs similar to that observed by NEIL[9] in 1917 in guineapigs injected with the blood of typhus patients in Texas. In smears from the hæmorrhagic tunica vaginalis stained by Giemsa's method, MOOSER[10] for the first time saw cells with the cytoplasm heavily loaded with rickettsiæ, cells which since 1933 have been known as "Mooser cells." Later, in 1928, MAXCY[11] isolated strains from the south-eastern United States which also produced Mooser cells in the tunica vaginalis of male guineapigs. Shortly afterwards DYER and his colleagues[12] brought forward conclusive evidence that the rat flea was a carrier of what is now known as murine typhus, a disease endemic not only in America but in Europe, Asia, and Africa. Investigations on louse-borne epidemic strains soon showed that some of these also produced scrotal reactions in guineapigs, though the lesions were not so frequent or so advanced as with murine strains. MOOSER[13] was therefore led to regard the differences between murine and louse-borne typhus as quantitative rather than qualitative, and to suggest that the classical strain results from the adaptation of the murine strain to the louse-man-louse cycle of transmission. No conclusive evidence, however, has yet been advanced for the soundness of this hypothesis. We are still uncertain how typhus manages to persist for years in a population where no known cases exist. There are three possibilities:—(1) the rat and the rat flea may maintain the infection which periodically becomes converted into the louse-borne form when a patient with murine typhus also harbours lice; (2) the fæces of lice deposited on clothes and furs may retain their activity for many months, a view specially favoured by Polish and German workers; or (3) persons who have had typhus may carry the rickettsiæ in the bone-marrow and may relapse after months or years. ZINSSER,[14] working on Brill's disease in Boston, convinced himself that all cases of that disease were late relapses of a typhus infection acquired many years previously in Eastern Europe, and MOOSER[1] has recently observed a case of classical louse-borne typhus in Zurich in a man who had suffered from typhus in Russia in 1918.

The other typhus-like fevers have now been classified. In the Mediterranean area fièvre boutonneuse has been shown to be related to Rocky Mountain spotted fever, as is the South African tick-borne fever and incidentally that discovered during the war in West Africa. Saõ Paulo typhus is now known to be identical with Rocky Mountain spotted fever. The scrub typhus of India, Malaya, and Java is identical with tsutsugamushi, while the so-called Manchurian typhus turns out to be of the murine type. Recent studies on the tick-borne typhus of North Queensland suggest that it may be related antigenically to the South African form. Great progress has also been made in the production of vaccines, which, if not entirely protective, are sufficient to lessen the severity of the infection. In *p*-aminobenzoic acid a chemotherapeutic remedy of considerable value has been discovered. Finally, there have been developed insecticides, such as D.D.T., whose lethal action on lice was demonstrated by MOOSER[15] as early as September, 1942. The researches of the last twenty years have thus clearly pointed the way to the control and eventual elimination of the rickettsial infections.

Clues to the Anti-anæmic Liver Principle

IT is twenty years since MINOT and MURPHY introduced the liver treatment of pernicious anæmia; and for twenty years biochemists have been striving to find out just what it is in liver that has this anti-anæmic effect. The clinical worker who follows their work[1] will find himself in a world of filtrates, precipitates, extracts, eluates, and dialysates, and may well ask if such a protracted effort in which, from the lack of a satisfactory animal test, every step had to be checked on human beings has been worth while. The answer is that this research has brought progressively more effective materials for the treatment of pernicious and allied anæmias, and has taught us a great deal about the composition of anti-anæmic factors. It has reduced the amount of solid material needed to bring about remission in a patient with pernicious anæmia from several kilogrammes to about 20 mg, and for maintenance in normal health from 400 g. a day to less than 1 mg., and it has replaced the daily "sandwiches" of almost raw liver by an

---

3. Terrés, J. Mem. Segundo Cong. nacional d. Tabardillo, Mexico, 1923.
4. Sinclair C. C., Maxcy, K. F. *Publ. Hlth Rep., Wash.* 1925, **40**, 241.
5. Hone, F. S. *Med. J. Aust.* 1922, i, 1.
6. Wheatland, F. T. *Ibid*, 1926, i, 26.
7. Fletcher, W., Lesslar, J. E. *Bull. Inst. med. Res. F.M.S., Kuala Lumpur*, 1925, **2**, 1.
8. Mooser, H. *J. Amer. med. Ass.* 1928, **91**, 19.
9. Neil, M. H. *Publ. Hlth Rep., Wash.* 1917, **32**, 1105.
10. Mooser, H. *J. infect. Dis.* 1928, **43**, 241, 261.
11. Maxcy, K. F. *Publ. Hlth Rep., Wash.* 1929, **44**, 589.
12. Dyer, R. E., Rumreich, A. [illegible] L. F. *Ibid*, 1931, **46**, 334, 1869, 2415, 2481.
13. Mooser, H. *Arch. Ir* [illegible] 932, **21**, 17.
14. Zinsser, H. *Amer. J. Hyg.* 1934, **20**, 513.
15. Mooser, H. *Schweiz. med. Wschr.* 1944, **74**, 947.

---

1. See the review by SubbaRow, Y., Hastings, A. B., Elkin, M., in Vitamins and Hormones. Edited by R. S. Harris and K. V. Thimann. New York, 1945, vol. III, p. 237.

ramuscular injection of 1 c.cm. once a week or even :o a month.

ɩn 1927 COHN and his co-workers started by :paring a liver extract free from known vitamins; :y eventually obtained a material containing 10·8% :rogen which they thought was a nitrogenous base, t its low nitrogen content excluded purine or rimidine bases. WEST showed that phosphorus-:e fractions were active, and obtained a material ought to be a peptide or diketo-piperazine, and on drolysis was able to identify β-hydroxy-glutamic id among others. In 1935 DAKIN and WEST opted a different technique for fractionating COHN's renteral liver product, using Reinecke acid, and ey obtained a material of which 'Anahæmin' is a pe. Hydrolysis of this product yielded arginine, sine, leucine, a trace of histidine, hydroxyproline, partic and glutamic acids, glycine, and 15% of ninohexose; pyrimidine and purine bases were)sent. Later they obtained active preparations free om aminohexose, and finally concluded that the emopoietic substance in liver was, or was associated ith, a peptide "possessing many, but by no means l, of the properties of an albumose." In 1942 'EST and MOORE, by electrophoretic methods, split p their most active fraction still further into an :tive "slow component" and a practically inactive fast component." A group of Scandinavian workers .ckled the problem by utilising adsorption on char-)al and elution with phenol, and two of them, LALAND ıd KLEM, eventually prepared active fractions 2–0·3 mg. of which corresponded to 100 g. of liver; ıt the technique seemed to spread the anti-anæmic :inciple among different fractions, rather than effect separation. Ten years ago, in Manchester, WILKIN-)N purified still further the Reinecke acid precipitates ıd obtained a material of which 18–36 mg. would :oduce a complete remission of pernicious anæmia—ıe greatest concentration of active material so far otained. In Switzerland, KARRER and his associates, sing an initial acetone extraction, and adsorption on harcoal with phenol elution, prepared materials of milar activity to WILKINSON's. This material was ee from flavine, pterine, and reducing carbohydrates; contained a small amount of sulphur, and yielded mino-acids, including arginine and tyrosine, on ydrolysis. In 1937 SUBBAROW and his colleagues ostulated that the active principle comprised more ıan one factor; they described a primary hæmo-oietic factor and three accessory factors—l-tyrosine, complex purine, and a peptide. The accessory ıctors were inactive by themselves but when com-ıned with the primary factor they gave rise to a ıuch better response than did the primary factor lone. The complex purine was later found to be an npure mixture containing mainly xanthine, but also strongly fluorescent xanthopterin. Attempts to etermine the nature of the primary factor failed, ut its properties suggested a pyridine derivative.

Many other attempts to identify the liver principle ave been made without, on the whole, adding any-hing significant to our knowledge. There is general greement that it is some form of amino-acid com-ination resembling a peptide. Organic chemistry oes not take us further than this point. It is the tage at which the analysis of the pituitary hormones nd insulin have remained for so long. The appearance, during this period of deadlock, of folic acid, a synthetic hæmopoietic substance with the same anti-anæmic effect as liver principle, is a surprise; for folic acid is a pteridyl glutamic acid, and pterines—which are complex pyrimidines—have repeatedly been excluded from the analyses of the liver principle. The manner of folic acid's action has yet to be worked out, but it is likely that it acts, like hæmopoietin, as an enzyme catalysing the reaction by which liver principle is produced in vivo; for it is this enzyme, rather than the liver principle itself, that is deficient in human pernicious anæmia. The action of folic acid was demonstrated in the course of researches into the activity as growth factors of the vitamin-B complex in bacterial metabolism; and its discovery once again illustrates the occasional startling advances gained by indirect approach when the direct method is gravelled.

Annotations

THREE IN ONE?

IN announcing the establishment of a new Ministry of Defence[1] the Government say that the possible advantages of combining the medical (and certain other) services of the Navy, Army, and Air Force—perhaps under the direct administration of the Defence Minister—are now being studied. This is welcome news, for, as we lately indicated,[2] amalgamation would reduce the number of doctors needed by the Forces both in peace and in war. Examples of redundancy in the triple system both here and overseas are fresh in the minds of those who served in the late war; and the wastage impressed even more forcibly the hard-worked civilian doctor.

The medical service must be (1) reasonably economical in money and men, (2) efficient and readily available to all, (3) flexible enough to fit in with administrative and operational needs, and (4) capable of rapid expansion in war. The efficiency of a unified service would, as now, depend chiefly on the men operating it, but also on the administration and leadership. Plainly, the enlistment of able men is of the first importance. One consideration that has often deterred keen young doctors from finding a career in the Forces has been the comparative dearth of clinical experience—a disadvantage which, in a unified service, might be partly offset by the chance of working, in turn, with each of the three Fighting Forces, in which everyday medical practice differs, even in peace-time. No doubt, too, men could be attracted by a further increase in the establishment of senior clinicians; a perennial grouse against all three Services has been the scarcity of senior clinical appointments; and many have rejected a Service career knowing that when they reach a certain rank they will go no further unless they abandon clinical medicine for an administrative post. Nevertheless the importance of administration should not be decried—especially in a single medical organisation where precise inter-Service coördination would be a first essential. In war, not only must the medical service be rapidly expanded but in all probability it must also be temporarily broken up into constituent parts, some of which will come under the operational control of field commanders. These parts must be swiftly and smoothly formed, and, once separated, must be well administered; and this calls for the training and maintenance of a corps of administrators out of all proportion to peace-time needs. One of the difficulties that may be set against a single service is the restriction it would impose on the training of this reserve of administrators. Lay administrative officers were employed to some extent in the late war; the Army, for example, appointed non-medical stretcher-bearer officers, company officers, registrars, and deputy assistant directors of medical services who acquitted themselves with distinction. No doubt the still wider use of laymen will be considered when the reserve of administrators is in the making.

---

[1] Central Organisation for Defence. Cmd. 6923. H.M. Stationery Office. Pp. 12. 2d.

[2] *Lancet*, Sept. 21, p. 421.

A unified service can be evolved and operated only by the closest understanding between representatives of the clinicians, the medical administrators, and the combatant arms of the Fighting Services; and the Ministry of Defence might well decide to set up a permanent council of this constitution. The difficulties should not be under-emphasised; but given good will in planning, and efficiency in execution, the scheme could benefit all three Services and enhance Britain's already notable reputation in Service medicine.

NICOTINIC ACID IN HYPOMENORRHŒA

EXPERIMENTAL results from Australia suggest that nicotinic acid may be usefully employed in amenorrhœa, hypomenorrhœa, and dysmenorrhœa. Hawker[1] found that the ovaries of guineapigs which had been given nicotinic acid in their feeds weighed 44·5 mg. on the average, whereas the average weight in the untreated animals was 36·5 mg. The application of nicotinic acid to functional disorders of menstruation first suggested itself when a patient who was under treatment with nicotinic acid for a chronic inflammatory lesion at the corners of her mouth started to menstruate, although she had never done so before; in addition, she lost 18 lb. in weight in four months, having previously been inclined to obesity. She was given 75 mg. of nicotinic acid a day for seven months and has menstruated regularly ever since. For the treatment of hypomenorrhœa Hawker suggests the coincident use of stilbœstrol 1 mg. three times a day for fourteen days from the commencement of the period and nicotinic acid 50 mg. three times a day throughout the whole cycle. His nine cases of hypomenorrhœa so treated all showed an increase in the duration and quantity of the flow. The material on which this paper is based is scanty, but it would be foolish to belittle any therapy which may help in these intractable conditions. Further experiments will be needed to discover the exact effect, if any, of nicotinic acid on the ovary; meanwhile, this relatively benign treatment is worth a trial in selected cases.

THE HOSPITAL OF THE FUTURE

EVEN the most modern hospitals nowadays become outdated in the course of twenty or thirty years. The moral seems to be that permanent buildings are not for hospitals: let them rather be transitory, functional, easily assembled, and quickly demolished. That is part of the solution to our present difficulties recommended by Prof. Harry Platt, whose address[2] last year to the Ulster Medical Society has now been reprinted. A rigid pattern of hospital, he holds, tends to determine function, which is fundamentally wrong. Rebuilding every thirty years is out of the question, and remodelling within the shell is a makeshift, not always economical.

The type of hospital in which function is best served, Professor Platt considers, is that in which a number of separate blocks or units, with self-contained ancillary services, each houses one of the major branches of medicine or surgery. These should be placed on an island site with a green belt encircling them, and with space for expansion. Such a multiple-block hospital need not be unsightly: he recalls a fine example of harmonious layout in the University Hospital at Lund, in Sweden, where the separate clinics are Georgian in style, though widely differing in age. In Manchester, his university, the Royal Infirmary, built on the plan in 1908 is already becoming out of date in way as a university teaching hospital, and the ad Eye Hospital, and St. Mary's Hospital for Women Children are both structurally obsolete. There however, a large potential island site of some 100 a visible from the air, which is to be zoned, cleared of dingy property, and dedicated to the purposes of a hospital centre.

In Manchester the separate institutes are to incl university preclinical departments of anatomy, phy logy, and pharmacology; separate units of medic surgery, obstetrics, child health, orthopædics, neurol ophthalmology, otolaryngology, radiology, dermatol an institute for the chronic sick, and a health cent a group of administrative, educational, and resident blocks—including the administrative headquarters the hospital centre, the preliminary training school nurses, students' hostels, residential flats for the and a medical institute and library: Professor P even foreshadows a shopping centre. But the f stage will be what the university architect calls "shack period." The first new block contemplated a neurological institute of 120 beds with both public a private wards and its own outpatient clinic; it w also have its own X-ray department and pathologic laboratories, in both of which research will be und taken. The director, and probably his assistant, w have consulting-rooms in the institute. The princi of the multi-institute hospital could probably be appli Professor Platt thinks, on a miniature scale in small cities.

Building itself is in a state of rapid change at pres and he suggests that it would be profitable to choo and subsidise a hospital architect, and give him five ye to study and travel. Meanwhile hospitals could be mak use of the shack period to concentrate on personnel.

THE BUSY NERVOUS SYSTEM

IT may be possible to predict what will happen wh a known electrical force is released into a known circu but when conditions within the circuit are constant varying, what then? Prof. J. Z. Young, in his inaugu lecture at University College, London, last Febru (now published[1]), described the ceaseless change whi is the normal state of the nervous system, and attack firmly the custom of representing it as a mere telegra system along which messages are transmitted.

We now think of nerve-cells as elongated bags of flu in which compounds are constantly being built up a broken down. And, thanks to studies on the gia nerve-fibres of the squid, we know that the fluid ru the length of the fibres, which therefore have the p perties of cylinders of liquid. They are conductors, b not passive conductors like electric wires; for a ner fibre is made ready to conduct by "the production o state of tension usually referred to as a charge across membrane." The nerve-cell works hard to " the fibre in the right condition to respond to a charge. The various sensory nerve-endings similarly triggered, but not all in the same way— will respond to touch, another to temperature, anot to light, and each must be maintained in the right sta to do its selective work.

The mechanistic theories on which most of us we brought up paid much attention to reflex action, leavi us with a picture of a conducting system which respond in a given way to a given stimulus, but which, in t absence of such stimuli, returned to a state of rest inactivity. This picture, it seems, has had a w influence on our attitudes and behaviour, not only ne and science but in life generally, for it implies oinism. For Professor Young, "this view of the sm as a marionette dancing under the pull of its y impulses is wrong. There are abundant quite e facts which show clearly that the brain is not by neans a passive thing, receiving all its orders from le. Its actions cannot all be adequately described lex, as reflections of outside influence."

---

[1] Hawker, R. W. *Med. J. Aust.* 1946, i, 872.

[2] *Ulster Medical Journal*, May, 1946.

[1] Patterns of Substance and Activity in the Nervous S London: H. K. Lewis. 1946. Pp. 19. 1s. 6d.

ysiologists in general, he considers, have not yet nded fully to the facts revealed by the electro-halograph—that there are continuous rhythmical ges of potential between neighbouring parts of the . These are independent of external stimuli: mical activity of the kind continues in the fore- of the frog even in a piece of brain removed from ody. When an image falls on the retina a pattern erve impulses is sent to the cortex of the occipital ; but the cells there are already active, "exciting other or changing their thresholds in manners as unknown." This activity must certainly affect the ion of the brain to the impulses reaching it. In this, els, we may begin to study the problems of recogni- of form and the process of learning. "Remembering" consist in "the maintenance of a particular pattern ode of activity."

this conception of the brain as a continually active it he sees the opportunity for a much more fruitful iboration between anatomy, physiology, neurology, psychology than was possible on the basis of the x concept. To those who think of anatomy as a and-dried subject, which early reached the end of ige of discovery, it will be revealing to learn that hatever part of the body you study you soon find that little is known about it, at least from current points iew." Professor Young wishes to see more than iboration between anatomists and physiologists: ould have a fusion in which those expert in special niques work side by side, remembering that they dealing with "an organised substance in a state of nised and directed activity."

HEPARIN IN INFECTIVE ENDOCARDITIS

HE possibilities of heparin in the treatment of infective ocarditis have been overshadowed by recent spec- ilar successes with penicillin. Although final evalua- is not yet possible, it now seems certain that heparin, sed at all, will be used rarely in this disease. It was employed in the treatment of endocarditis in 1939,[1] it was soon found that its problematical advantages usually outweighed by its proved dangers. When arin was given in conjunction with sulphonamides, recovery-rate—6·5%—was an improvement of only % over results with chemotherapy alone. When it iven with penicillin, hæmorrhagic complications are e common than with penicillin alone, although the overy-rate (55%) remains high; no direct synergism ween heparin and penicillin can be demonstrated.[2] son and Hunter[3] have summarised current opinion oncluding that heparin is not essential to the treat- it of infective endocarditis. They find only two cations for its use: to prevent retrograde intra- cular clotting where a large embolus lodges in a vessel; to inhibit thrombosis when penicillin is given intra- ously. The latter indication is now rarely encountered e the intravenous route has been virtually abandoned avour of intramuscular injection, which gives equally d results; moreover, the increased purity of present- penicillin has undoubtedly lessened the risk of avenous clotting. Other workers[4] advise resort to heparin only when the disease has not responded to one course of penicillin, and add: "in such a case we would hope that heparin might cause disintegration of the vegetations and pray that the fragments will not enter the cerebral vessels."

The value of penicillin in infective endocarditis has now been firmly established in this country.[5] The principal points which suggest that the drug is likely to fail are congestive failure, particularly when the aortic valve is infected; embolic incidents; and a long history. Where the condition has existed for more than a few months there is increased resistance to the penetration of penicillin according to the size of the vegetations and the fibrin and platelet barrier with which they are covered. Necropsies have not provided histological proof that anticoagulants influence the course of the disease under such circumstances[6]; nevertheless, the bad prognosis in these resistant cases may still tempt physicians to give heparin a further trial on the score that nothing can be lost by heroic measures.

Hedman, M., Hamburger, W. W., Katz, L. N. *J. Amer. med. Ass.* 1939, 113, 702. Kelson, S. R., White, P. D. *Ann. intern. Med.* 1945, 22, 40.

lokotoff, R., Brams, W., Katz, L., Howell, K. M. *Amer. J. med. Sci.* 1946, 211, 395.

awson, M. H., Hunter, T. H. *Ann. intern. Med.* 1946, 24, 170.

ery, L., McKrill, N. *Arch. intern. Med.* 1946, 77, 367.

[5] Christie, R. V. *Lancet*, 1946, i, 369.

[6] Priest, W. S., Hildebrand, E. *Proc. Inst. Med., Chicago*, 1946, 16, 173.

SUPPLIES OF ARTIFICIAL RADIOACTIVE SUBSTANCES

THE Government is to establish a national centre for the processing and distribution of radium, radon, and artificial radioactive substances for scientific, medical, and industrial purposes. The centre will be operated by Thorium Ltd., acting as agents for the Ministry of Supply, and as a first step the Ministry will purchase its buildings and plant at Amersham, Bucks. The extraction of radon, which during the war was carried on at Barton-in-the-Clay under the auspices of the Medical Research Council, will be transferred to the new centre, and Johnson Matthey & Co., Ltd., are voluntarily handing over to it their business of filling radium into containers. The Amersham site will not be large enough to accommodate the centre permanently, so it will be removed to new premises when the shortage of building labour has eased and the volume and scale of its work can be assessed more clearly. The centre will be controlled by a council, which will include representatives of the Ministry of Supply, the managing agents, and users of its products.

In the United States the distribution of radioisotopes prepared at the Clinton Laboratories, Oak Ridge, Tennessee, began in August, the first recipient being the Barnard Free Skin and Cancer Hospital of St. Louis, which received a so-called unit of carbon 14 (C^{14}) weighing about one ten-thousandth of an ounce. The unit has a radioactivity equal to that of 1 millicurie, and, since future investigators with radioisotopes will often refer to the actual emission of the substances they are using, it may be recalled that 1 millicurie emits 37 million alpha particles per second. It is understood that activities will be referred to in terms of the curie or millicurie rather than to radium; the C^{14} unit cost the hospital about $400, which can be reckoned a permanent investment, seeing that the half-life of C^{14} is estimated to be between 10,000 and 25,000 years. It is to be used for studying the processes by which cancer is produced. The investigations planned[1] will tackle such diverse medical problems as the mechanism of cancer production, the utilisation of sugar in diabetes, the dysfunction of the thyroid gland, the growth and composition of tooth and bone, and the rôle of iron in anæmia. Outside the fields of medicine the various new isotopes will be applied to problems in agriculture and industry; the outstanding agricultural problem to be studied is the mechanism by which plants utilise the energy of sunlight. Most of the subjects for study are not essentially new, but the method of approach may be said to be so, for the investigators aim at following processes step by step, any faltering being signalled to the observer by the Geiger counters in circuit.

---

[1] See *News Notes (Washington)*, August 15, 1946.

ANTICOAGULANTS IN CORONARY THROMBOSIS

EMBOLI and thromboses in various parts of the arterial system are recognised complications of coronary thrombosis, occurring in 14% of Blumer's 1000 cases,[1] and in 18 of the 100 cases reported by Nay and Barnes.[2] These complications have usually been attributed to narrowing of the arterial lumen and stasis in the blood-flow, but Peters and colleagues[3] have noted that in three-quarters of their patients with coronary thrombosis there was an increased prothrombin activity. This observation is in agreement with de Takats's[4] observation that patients with coronary thrombosis show an increased resistance to heparin.

In view of Solandt and Best's evidence[5] that myocardial infarction and thrombus formation in the coronary tree can be prevented by the administration of heparin, it was only natural that physicians should consider its clinical application. There are difficulties and even dangers in this use of heparin; but the introduction of dicoumarol by Link and his colleagues[6] gave fresh impetus to the study, and several reports have recently appeared in American journals.[3] [7] Peters and his associates have used dicoumarol in a series of 50 patients with coronary thrombosis, among whom the incidence of clinical embolism was 2%, as against 16% in a control group. The mortality-rate in the dicoumarol group was 4%, compared with 20% in the untreated group. Although dicoumarol was given for at least six weeks and sometimes much longer, no serious toxic effects and no frank hæmorrhages were noted; but in three patients microscopic hæmaturia was found. It is emphasised that this treatment should be given only when there is a laboratory for the estimation of the prothrombin clotting-time. Definite contra-indications are hepatic disease and any blood dyscrasia. Special care must be exercised in the presence of hypertension, and the dicoumarol-like action of salicylates[8] and quinine[9] must be borne in mind. Dosage was determined entirely by the prothrombin clotting-time of diluted plasma (12·5%), for which the normal is 85–100 seconds. The usual dose is 300 mg., which can be repeated daily unless the prothrombin clotting-time of 12·5% plasma reaches 400 seconds, which is the upper limit of safety. Hæmorrhage, should it occur, can be controlled by the intravenous administration of menadione bisulphite 37·5 mg. The scheme is very similar to that of Wright,[7] who uses the prothrombin time of undiluted plasma as his guide: the normal figure here is 13–17 seconds, and dicoumarol was discontinued if the time exceeded 30 seconds. Wright's report is only a preliminary one; but, considering that most of his patients were selected for treatment because of repeated episodes of multiple thrombi or repeated embolic phenomena elsewhere in the arterial tree, his results are certainly encouraging. Of 43 patients selected because of complications known to be associated with a very high mortality-rate, only 11 (25%) died, compared with an anticipated risk of 60–70%; while of 33 patients having their first or second uncomplicated attack of coronary thrombosis, 4 (12%) died, compared with an anticipated mortality of 20–30%.

Two further aspects are worth considering. It has been confirmed by Peters and his co-workers that one risk in using digitalis for the heart-failure of thrombosis is its tendency to increase the clott of the blood.[10] Does dicoumarol neutralise this Scherf and Schlachman[11] found that the p time and the plasma coagulation time are after the intravenous administration of the with ethylenediamine, and also of theophylline acetate. A similar effect was obtained by the administration of the methylxanthines (theoph with ethylene diamine, theobromine, and theob sodium acetate). This is not a new observation of the earlier German workers actually reco theophylline with ethylenediamine as a coagulant, Wright gave it as part of his "conventional tr to patients receiving dicoumarol); but it suggests a careful review of our treatment of coronary throm is called for. Until much fuller data are dicoumarol should clearly be used only in sele cases treated in hospitals.

SIXTH AND LAST

THE final issue of the sixth volume of the *Bulleti War Medicine* contains two epilogues which mark end of this publication. The first, by Sir Edw Mellanby, F.R.S., secretary of the Medical Resea Council, recounts briefly the history of its inception, second, by Dr. Charles Wilcocks, director of the Bur of Hygiene and Tropical Diseases, acknowledges services of all those whose work contributed to the v of the *Bulletin*. Together, these epilogues reflect a fru collaboration between the Medical Research Council its publications officer, the bureau, and the large num of abstracters who devoted part of their meagre le to the task of providing medical information for th who otherwise might have missed it. Though immediate purpose of the *Bulletin* has now been ser the medical historians of the war will find in it m of the material they may need for describing the deve ments of that period of—in some directions—phenome progress. The rapid growth of knowledge in relatio transfusion, penicillin, D.D.T., and mepacrine, for instan is reflected in these abstracts.

The enormous importance of diseases (especi tropical diseases) in military campaigns has reaffirmed during the war, when the success of operat turned on the maintenance of forces healthy enoug undertake them. That many of the problems invol were quickly solved was largely due to the stim given to research by the urgency of the situation. the same or similar problems persist among the indige inhabitants of these tropical countries, and we hope that research will be pursued as vigorously peace as for war. There is still, therefore, the same for information on tropical diseases and on public-he measures, and this will continue to be supplied by bureau in its two publications, the *Tropical Dis Bulletin* and the *Bulletin of Hygiene*, which wer existence long before the war, and which were the m on which the *Bulletin of War Medicine* was based.

A MEETING has been arranged at the London Scho Hygiene, Keppel Street, London, W.C.1, for Thur Oct. 17, at 3.30 P.M., with the object of inaugurati council for the care of spastic children. The chair wil taken by Mr. G. R. Girdlestone, F.R.C.S. The ac secretary is Mr. H. P. Weston, c/o Council for the Car Cripples, 34, Eccleston Square, S.W.1.

WE regret to record that Lieut.-Colonel R. J. THOMPSON, who retired from the secretaryship St. Thomas's Hospital medical school last month, die Oct. 2. He was 60 years of age.

---

1. Blumer, G. *Ann. intern. med.* 1937, 11, 499.
2. Nay, R. M., Barnes, A. R. *Amer. Heart J.* 1945, 30, 65.
3. Peters, H. R., Guyther, J. R., Brambel, C. E. *J. Amer. med. Ass.* 1946, 130, 398.
4. de Takats, G. *Surg. Gynec. Obstet.* 1943, 77, 31.
5. Solandt, D. U., Best, C. H. *Lancet*, 1938, ii, 130.
6. Campbell, H. A., Smith, W. K., Roberts, W. L., Link, K. P. *J. biol. Chem.* 1941, 138, 1.
7. Wright, I. S. *Amer. Heart J.* 1940, 32, 20.
8. Shapiro, S. *J. Amer. med. Ass.* 1944, 125, 546.
9. Pirk, L. A., Engelberg, R. *Ibid*, 1945, 128, 1093.
10. de Takats, D., Trump, R. A., Gilbert, N. C. *Ibid*, 1944, 840.
11. Scherf, D., Schlachman, M. *Amer. J. med. Sci.* 1946, 83.

Special Articles

TUBERCULOSIS IN POLAND

MARC DANIELS
M.D. Paris, L.R.C.P.E., D.P.H.
MEDICAL OFFICER, HEALTH DIVISION, UNRRA

is report is based on information collected during weeks' tour of the Polish tuberculosis services. ing the areas of eleven of the sixteen regional orities, and including personal visits to twenty- e sanatoria and numerous hospitals and dispensaries. discussions with doctors in these places, in provincial th offices, and at the ministry of health.

ne situation, a tragic one, must be set against the ground of war-time and post-war Poland. The years' occupation of Poland was so grim that the ple must be considered primarily as survivors of occupation. Almost every Pole has lost relations home, has starved, or has lived in unimaginable ditions. Very many can roll up a sleeve and show centration-camp numbers tattooed on their arm.

he Germans set about systematic extermination of llectuals and professional people, with the object of ucing Poles to the level of slaves. Leading medical cialists were taken from the wards and shot in their es or against a street wall. Their equipment and aratus for research was stolen or deliberately troyed, as were their documents representing many rs of valuable work. Of the 12,900 doctors in 1939 6000 are left. In a rural area we gave a lift to a ntry doctor; he is sole doctor for an area with 00 people and has no car. Nurses also are very ce; *half of them were killed during the war.*

he devastation of Warsaw, Poznan, and Wroclaw ndescribable. Warsaw was destroyed systematically, se by house, street by street. In the shambles t remain live half a million people. Among this ulation living in dark cellars and one-room flats ch by a miracle retain four walls and a ceiling there several thousand cases of tuberculosis. Overcrowding shortage of food provide all the tubercle bacillus uires in order to flourish. In devastated rural areas ilies are living in dugouts and mud huts. Millions of s are still lying fallow for lack of seed, equipment, abour. Some areas have yet to be cleared of mines; sants *impatient to plough their land are sometimes wn to pieces.*

o the rural areas are returning peasants and children peasants who were taken off for slave labour in many. Many contracted tuberculosis there and, rning home, are spreading infection. Millions of the ple are, or have recently been, on the move. They rn from camps for displaced persons in Germany, n the armies, from Russia. Large communities being transferred from the old eastern provinces to newly acquired western provinces. People who ght refuge in the country during the war are trying eturn to the city, even to Warsaw.

gainst this background of devastation and potential os reconstruction is going on. Some of the work escribed in this report. In assessing the services and k done to date, the background must not be forgotten. e work of public-health officers with no records, of fessors of medicine with no clinics, of scientists with laboratory or equipment in Poland needs to be seen be believed.

MORTALITY

There has been an alarming increase of tuberculosis Poland during the war years; and the disease is now lespread. Destruction of all pre-war records by the rmans renders detailed comparisons impossible. During the war only such services were allowed to function as would protect the Germans from danger of infection, and public-health services worked on a very reduced scale. Towards the end of the war, during the retreat, there was wilful destruction of public buildings and records. At present the services are being restored, but records are still very limited and fragmentary, since new workers are being trained to replace the many thousands killed and executed, and many new workers are still inexperienced and overworked. In view of these limitations, statistical information has been considered carefully, and only that considered valid after personal discussion with the health authorities is given here. The only figures of value come from large towns. Death certificates outside towns may be given by non-medical persons and are for statistical purposes valueless.

Warsaw.—The number of deaths from tuberculosis per 100,000, already high before the war, rose 200% in the war years, from 155 to 452 in 1941 and 500 in 1944. Before the war the rate was four times as high as in U.S.A. (white population): in 1944 it was fifteen times as high. The tuberculosis mortality in Warsaw and Lodz, compared with that in U.S.A., Copenhagen, and Stockholm, was as follows:

	1935	*1941*	*1944*
Warsaw	155	452	500
Lodz: All persons	176	316	371
Germans	..	139	155
Poles	..	378	461
U.S.A. (whites)	39	35	34
New York (all persons)	..	46	48
Copenhagen	51	44	40
Stockholm	92	75	70

In 1945 the registered tuberculosis deaths in Warsaw totalled 1189, which figure for a population of 400,000 gives a death-rate of 297. It must be remembered, however, that in that year, after the destruction of the city, the population numbered only a few thousands in January, and former inhabitants returned during and after liberation, to reach a total of nearly half a million only at the end of the year. If a mid-year population figure were available, the rate on this basis would be much higher than 297.

The recent census has shown that the proportion of young adults in Warsaw has fallen to an abnormally low level, owing to killing and deportation of all active members of the community; the *population age-distribution curve* shows a well-marked dip between the ages of 15 and 30. An adjustment of the death-rate to take into account the absence of this most susceptible age-group would have the effect of raising the rate considerably.

In Jews the death-rate before the war was relatively low, about 80. In 1941 it had risen to 440.

Lodz.—Here the mortality rose from 176 before the war to 401 in 1943, dropping later to 371 in 1944 and 288 in 1945. The war-time rates relate to the combined German and Polish population. For the Poles alone, the figure was 488 in 1943 and 461 in 1944, while in Germans the death-rate was only a third of that in the Poles (see fig. 1).

Poznan.—Mortality rose from 198 before the war to 360 at the end of the war.

Krakow.—In 1945 there were 615 deaths from tuberculosis in a population of 221,260, a death-rate of 278.

INCIDENCE

Mass Radiography Surveys.—This is the most valuable method of determining incidence of *pulmonary* tuberculosis in large communities. Several such surveys have been made in Poland since the end of the war. There are no *similar results* covering the pre-war period, but these recent figures are very striking.

(1) At Krakow University 9387 students have been examined by mass radiography in 1945–46, with the result that 392 (4·2%) are found to have tuberculous lesions considered active, and 623 (6·6%) tuberculous lesions requiring observation, making a total of 10·8% who require treatment or observation.

(2) In the Poznan surveys of 1945–46 7% of 4000 university students, 6·5% of 201 high-school students, 7·1% of 463 school-children, and 13·5% of 1361 factory employees have been found to have tuberculous lesions requiring treatment or observation.

(3) A Swedish Relief Service team is examining students in Warsaw. Provisional results, for 2000 students, indicate that over 15% have pulmonary tuberculosis *requiring treatment or observation.*

(4) During the occupation 1941–44, of 180,000 railway employees examined by the social-insurance organisation 7% were found to have pulmonary tuberculosis requiring treatment and 5% required observation.

Mass Radioscopy Surveys.—Of 4220 Lodz high-school and university students examined 5·8% have tuberculous lesions requiring treatment or observation; and of 1500 Lublin university students examined 2·1% have tuberculous lesions requiring treatment and 9·7% have tuberculous lesions requiring observation. These figures of the results of mass X-ray *examinations are approximately ten times as high as corresponding* figures in England (fig. 2) or the U.S.A. They confirm the impression given by the very high mortality in large towns of Poland.

Known Clinical Cases.—The figures given above indicate the prevalence of undiagnosed tuberculosis in the general population. They do not include the known cases, diagnosed by ordinary clinical methods. Tuberculosis is not notifiable in Poland; but some information is provided by the numbers of patients attending tuber*culosis dispensaries. In Upper Silesia, in a population of* 1,600,000, there are over 16,000 cases (1%) known to the tuberculosis clinics. In Poznan, a city of 283,000 inhabitants, there are 3293 (1·2%) cases known to the city dispensary. In the town of Zgierz 1·7% of the population are known to be tuberculous and requiring treatment. These figures are high, compared with similar figures in U.S.A. and Great Britain. Moreover it must be emphasised that not all cases are reported to the tuberculosis clinics; the figure, therefore, falls far short of the total of diagnosed cases.

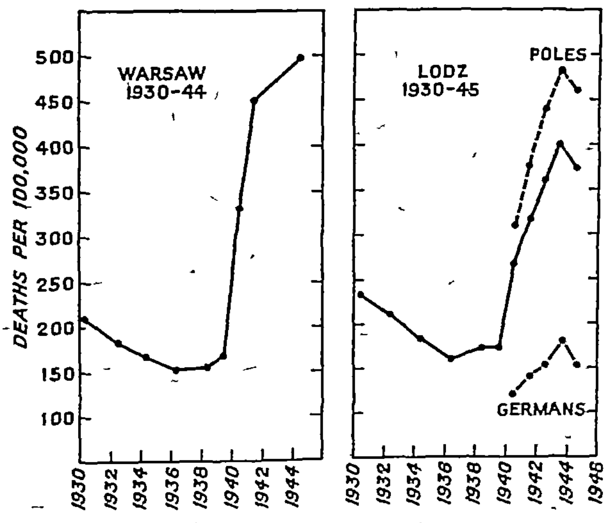


Fig. 1—Tuberculosis mortality in Warsaw and Lodz.

TUBERCULOSIS SERVICES.

After 1918, legislation placed the onus for
and *maintaining* dispensaries, tuberculosis
sanatoria on the smaller local authorities—
communes—empowering them to unite to form
schemes. The province (vaivodeship) was to
an overall responsibility of directing the small
authority regarding when and where such services
be established. General control was exercised by
department of health of the ministry of labour
social welfare. Educational and propaganda
was conducted largely by the National Anti-Tub
Association.

The *main* work *of the services* was conducted
tuberculosis dispensaries, which numbered 532 in
Of these, 436 were in health centres administered
by the local authority and providing diagnostic
treatment facilities for venereal diseases,
tuberculosis, and incorporating also maternity
child-welfare services. They were staffed by d
who usually also carried on private practice and
for social-insurance and other organisations. The
insurance body also conducted a few tuberc
dispensaries independently.

In 1938 there were 2680 beds for tuberculosis i
general hospitals and 5638 in 45 sanatoria. O
of the sanatoria belonged to local authorities; the
were owned by the social-insurance organisation,
bodies, Polish Red Cross, and professional and
tional associations. There was no central or
control or planning of the institutions.

Payment for hospital and sanatorium treatment
the responsibility of district local authorities in all
not covered by such organisations as social insur
Local-authority funds being very limited, this mea
practice that institutional treatment could be
to only a very small proportion of those unprotecte
insurance or private income.

At the present time general control is exercised b
tuberculosis control section of the newly created *min*
of health; the section is directed by Dr. Tel
Regional health control is exercised through the
departments of the fourteen provinces and of the
of Warsaw and Lodz. The tuberculosis subco
of the National Health Council acts as an advisory
The Anti-Tuberculosis *Association* is being reconstit

Dispensary Service.—The services, which suffered
losses during the war, are being reorganised with mo
less the same general structure, and the same un
division of financial responsibilities. Dispensaries, ma
of which ceased to function during the war, and wh
in any case were allowed to serve only as diagno
centres without being able to provide or arrange for tre
ment, are now being rapidly restored; 440 are oper
at present, nearly all within health centres. There is
serious lack of equipment, X-ray units especially,
a great shortage of doctors and nurses, particularly
specialised personnel. The doctors at these

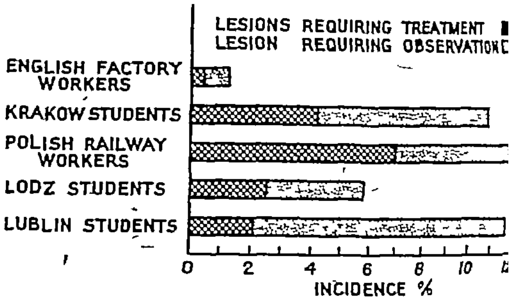


Fig. 2—Incidence of tuberculosis found by mass X-ray survey

y all of them doing this service in addition to busy te practice, are doing a heavy job of work. Rela- y few of them have any particular training in tuber- sis. In the province of Kielce, for instance, for -five dispensaries there are forty-five doctors, four of whom have special qualifications. The ensary service, main prop of the tuberculosis organi- on, is for the most part staffed by unspecialised per- nel provided with a bare minimum of equipment, and ggling with an ever-increasing tide of tuberculous ients. The chief tuberculosis officer (also part-time) the provincial health department has very little hority either over the dispensary service or over the atoria.

ase-finding Surveys.—Several case-finding schemes under way; the results of some of these have en given. There are seven photofluorographic units, ated as follows:

n Warsaw, in op.,	70 mm., Swedish Relief Service.	
n Krakow, ,,	35 mm.	Belongs to social-insurance organisation.
n Poznan, ,,	35 mm.	
n Poznan, not in op., lens missing		
n Bydgoszcz, ,,	,,	Belongs to dispensary service
n Katowice, ,,	awaiting film	

The main universities have an excellent diagnostic rvice for their students resumed on the same basis before the war. There is also a very fine students' natorium, probably the first to have been founded in rope (inaugurated in 1907).

Hospital and Sanatorium Services.—A complete picture these services cannot be given at present, as the uation changes from day to day; only information llected quite recently is presented.

In general hospitals, out of a total of 86,000 beds, 00 are set aside for the treatment of tuberculosis.

During the six years of war all the sanatoria except e were occupied by the Germans. Towards the end the war, as the Germans retreated, they destroyed, oted, and burnt many of the buildings, stripping them all equipment. This was the situation the Poles faced year ago: a country which had been without sanatorium cilities for its tuberculosis population for six years, natoria destroyed, sanatoria with no beds, no equip- ent, and no staff. During the past year people have en occupied with the enormous task of restoring these natoria within the Polish tuberculosis services. Almost e whole time, for instance, of the director of the udents' sanatorium in Zakopane is taken up by problems rebuilding and by search for equipment, instruments, d drugs. This search, in a country plundered stematically during the war, is no easy task. Principal ems lacking are thoracoscopes, replacement bulbs for oracoscopes, surgical sets for thoracoplasty, X-ray m, developer, and fixer, X-ray tubes, needles, plaster, boratory reagents, and narcotics.

In spite of lack of material the sanatoria are being stored very rapidly. Much equipment has been ceived from UNRRA. There is now more sanatorium commodation than before the war, thanks to the quisition of previously German institutions in Lower lesia. There are 11,580 "potential" sanatorium beds. description of the situation in Southern Poland, where ost of the best sanatoria stand, will help to explain hat this "potential" figure means at present.

In Lower and Upper Silesia and in Zakopane there are xteen sanatoria with a possible total of 6078 beds: 301 are not yet ready (equipment lacking, premises not ompleted); 1840 are still requisitioned by armed rces; and 2937 are available for tuberculous patients. f the 2937 available beds 1905 are occupied by patients of whom 237 are German) and 1032 are empty.

The 2937 beds are in excellent sanatoria, equipped for ctive treatment of tuberculosis and staffed by competent octors. Yet 1032 stand empty. The main reason for his lies in the financial difficulties of the health authorities responsible. For some patients cost of hospital treatment may be covered by an insurance organisation, the Polish Red Cross, or the ministry of health, which assumes responsibility for treatment of repatriates. A few persons may bear the cost privately. But the majority have no protection of any kind, and for them the small local authorities are theoretically responsible for provision of treatment for tuberculosis. In fact, with the present high cost of maintenance in institutions, 100–200 zlotys a day, and with few local taxes collectable, most authorities can only afford to maintain very few patients in hospital or sanatoria. Most of their patients, when they do go, are sent only for a short time. From Lublin city dispensary for instance, where 1211 new cases were diagnosed in 1945, only 99 patients were sent to hospital (for an average interval of three weeks) and 9 to sanatoria. This dispensary has a waiting-list of 646 persons. Bydgoszcz provincial authority has a good sanatorium at Smukala, with 124 beds, yet of the 360 new tuberculous patients diagnosed in the first three months of this year none could be sent to sanatoria.

The ministry of health is able to pay for only 1000 patients for the whole country, and these include repatriates. For patients unprotected by insurance, private income, or otherwise, there is little hope of any treatment other than two weeks in the local hospital for induction of pneumothorax when this is thought advisable; they are then sent home again. These patients are the ones in the worst economic condition; it is not difficult to imagine the prognosis for such patients, and the risks for their families. Even for insured patients, the limit of stay in sanatoria is usually three months.

On the basis of an overall tuberculosis death-rate of 300 per 100,000, and setting the minimal standard of 100 beds against every 100 deaths, there should be at least 66,000 beds. There are only 11,580; and, though half of these are not ready or are still requisitioned, there are still many beds standing empty because no one can bear the cost.

The main cost is food. Sanatoria are obliged to buy most of their food in the open market. The cost of food varies from one province to another. In one, 100 zl. may cover a relatively adequate diet of about 3000 calories (with too high a proportion of carbohydrate); in Lower Silesia 150 zl. may provide only a diet well below the minimal requirements for a healthy person. For example, in Zeylandowo, patients receive a small portion of meat or fish twice a week, no cheese, and no butter. For three months they had no milk except in soup, now they have 0·25 litre a day. Nurses are constantly leaving because of the bad diet, since they have the same as patients but minus the milk. In one sanatorium, arriving at 1 P.M., we partook of the main meal; it consisted of a thin vegetable soup and a plate of rice.

In several institutions the diet is not more than 2000 calories. From Kamieniegura sanatorium we brought away a complete list of all foods consumed during March by the 400 persons in the sanatorium. An analysis on the basis of figures given by the M.R.C. Memorandum (no. 14, 1945) on "Nutritive value of war-time foods" shows that the average daily diet per person in this sanatorium amounted to 1995 calories, with 348 g. of carbohydrate, 37 g. of fat, and 67 g. of protein (of which 23 g. was animal protein).

Thus the problem of food not only affects the condition of patients in sanatoria but also is indirectly responsible for many beds standing empty. UNRRA is committed to a programme of provision of food to the whole Polish people through the central government and cannot undertake specific allocation and distribution; but any assistance that could be given in provision of food to the sanatoria would go a long way to the solution of their problems.

Staffing of Services.—Reference has already been made to the severe shortage of doctors and nurses. There is an average of one doctor for 3600 people, and one nurse for 7000 people. We met a woman doctor running a health centre who works there all day, has no nurse to help her, and is so overworked that she has no time to keep any record of patients. In her district previously there were 72 doctors; now there are only 10. In the sanatoria there are for 100 patients usually 4 qualified nurses, this number including both day and night nurses. In one sanatorium for 275 patients there are 5 nurses. Many dispensary nurses have no time to do any health visiting.

The lack of specialised personnel is particularly great, as a relatively high proportion of these were killed. The chief thoracic surgeon for Warsaw was shot by the Germans. There are now in Poland only two surgeons specialising in chest surgery.

Courses are being arranged for doctors; they are planned as intensive courses lasting two or three months and will be given in the principal university centres. Grave difficulties are arising in this connexion. Owing partly to economic difficulties of doctors, and partly to the fact that a country doctor can find no locum to replace him even for a few weeks, there are very few candidates, though the ministry is offering maintenance and 8000 zl. a month to those attending the course.

In Poland, as throughout the rest of liberated Europe, a constant cry is the need for medical literature covering the war period. In addition, Poland suffered complete and wanton destruction of many medical libraries, public and private, so that she has lost also much valuable medical literature from before 1939.

CONCLUSIONS

The incidence of tuberculosis in Poland is now alarmingly high. Involving usually chronic disease over many years, and affecting mainly adolescents and young adults, it causes an immense wastage of human life. Of the toll on health taken by the war and the German occupation, it is by far the most serious disease, and will continue to be so for many years to come. The fact that it is not an acute epidemic disease renders less apparent the need for an intensive campaign; the need, however, is urgent.

Great progress has been made in re-establishment and re-equipment of the services. But these services started almost from zero after liberation a year ago; equipment is still in very short supply, and organisation is still defective. The situation is such that it must be regarded as nothing less than a national emergency. Recommendations have been made for an emergency supply programme and for urgent reorganisation along lines practicable under present conditions.

The task that lies before the ministry of health is no mean one; it is that of planning tuberculosis control in a country which has been systematically devastated, which has a very high incidence of tuberculosis, which lacks equipment, doctors, nurses, and trained administrators, and which must concentrate its economy mainly on reconstruction. In a five-year programme far more equipment will be required, particularly for the establishment of tuberculosis hospitals to raise the total to 30,000 beds. Radical reorganisation will be necessary if the service is to be well staffed and to come within a single national plan of attack on tuberculosis. A much greater proportion of the national budget will have to be devoted to the anti-tuberculosis campaign (before the war the proportion was exceptionally low).

Only after the initiation of such a programme, and after a raising of the living standard, which will of necessity be slow, can any important and continuous decline in this disease be expected in Poland. Further, though much will depend on the Polish people themselves, war-time devastation has been such that assistance from without will be needed for a long time and on a generous scale.

INTERNATIONAL SOCIETY OF HYDROLOGY

THE first post-war annual meeting of the was held at Buxton from Oct. 4 to 6. The representatives from abroad were: Belgium, Michez (Brussels); Czechoslovakia, Prof. F. (Prague); France, Dr. P. Petit (Royat); Dr. J. van Breemen; Switzerland, Dr. V. Ott (U.S.A., Dr. Loring Swaim. The following officers elected for 1946–47: president, Lord Horder; of council, Dr. J. B. Burt; vice-chairman, Dr. G. Kersley; hon. treasurer, Dr. Frank Clayton; secretaries, Prof. František Lenoch and Dr. D Wilson; 39 new members and 5 associate were elected. Arrangements for renewing the tion of the society's journal were discussed.

In his presidential address, Lord Horder, one of two surviving founder members of the society, emph sised the great part which would be played in restoration of international relations by free of medical men of different countries for discussion common problems.

Dr. J. van Breemen discussed the four causal facto in rheumatic disease—focal or other infection; con stitutional anomalies; *abnormalities of the peripher* circulation and in the defence mechanism of the skin and social and environmental influences—in relation medical hydrology.

Dr. V. Ott described research work done in Switzerlan in testing the effects of thermal treatment on the auto nomic nervous system.

Dr. Abraham Cohen, of the Philadelphia Gener Hospital, gave an account of the use made in his hospita of physostigmine in the relaxation of muscle spasm He referred to the experience of other workers wit '*Prostigmin*' but maintained that physostigmine sal cylate was equally efficacious, less expensive, and le toxic. The method adopted in the arthritis (inpatien ward was to give all patients injections of isoton saline daily for a week. If these and complete re produced no improvement, hypodermic injections atropine (0·06 mg.) were given daily for the next wee If again there was no improvement, he gave mine and atropine mixed in the same syringe, beginnin with 0·06 mg. of each. The quantities were adjuste according to whether side-effects on the autonom *nervous* system were *produced* by either of the tw drugs. If the physostigmine/atropine balance w correct, the treatment could be administered indefinitel but the usual period was six weeks. The best resul were obtained in rheumatoid arthritis when the spas was very severe. The treatment was not to be regarde in any way as a cure but as an auxiliary method whic might produce considerable amelioration of symptom particularly relief of pain. Among other conditio in which good results had been obtained were spas due to war wounds and other traumata, Felty's syn drome, and paralysis resulting from nerve injuries.

Dr. Loring Swaim discussed American concepts of the treatment of chronic rheumatic diseases, stressing the importance of individual reactions to personal and social environment, and the responsibility of the physicia to reorientate the patient.

Mr. R. B. Whittington (Manchester) discussed correlation between the plasma viscosity of the blo and the erythrocyte-sedimentation rate; he produced evidence of the greater reliability of the former in reflecting the progress of various diseases.

TOWN MEETS COUNTRY

"ONLY when the soil of a country is in good heart and fruitful can the rest of that country's system b in good heart also." In this belief the founders of a new Association of Agriculture seek to engage the interest of the British public in a prosperous countryside, which they regard as necessary "economically, nutritionally and socially." They hope to achieve this object partly by the education of the young, but partly also through the coöperation of medical authorities who can emphasis the need for a national food policy that will enable British agriculture to make its *full contribution.* "A y farming industry is everybody's affair, and every- should realise it."

new association was launched last Monday night Mansion House dinner with the Lord Mayor of on in the chair. Mr. Tom Williams, Minister for ulture, said that only 7% of the population of this try now work directly on the land, and the man g in the heart of urban Britain naturally has more d for the habits of the people among whom he was ght up than for the environment of his great- dfather. Agriculture was now fully recognised as a onal asset, but "town and country must eventually to understand each other's problems."

ord De La Warr, president of the association, said in the past the towns had demanded a rising dard of life at the expense of food-producers both ome and abroad. That scheme of things had broken m between the wars because of the glut which pre- ted food-producers from buying the products of the n, and it had now broken down again for precisely opposite reason. He based the claims of British iculture not so much on good will or gratitude for r services as on the continuing need for food-produc- n at home: why should precious money be sent oad to pay for food that can be grown in this country? eriods of plenty exploited by the consumer, and riods of shortage exploited by the producer, are not ing to lead us anywhere," said Lord De La Warr. was the task of the new association to show that, erever temporary advantage may lie, in the long n the interests of town and country are the same. was not concerned with policy but with education, eking to create the mental background against which licy may be considered. This country should face the ture not as two nations but as one, with equality of ghts and responsibilities.

Colonel Walter Elliot, F.R.C.P., said that as a former inister of Agriculture he shared the uneasiness of the untryside; and when Minister of Health he had been sponsible for inviting over a million women and ildren into the country—thereby introducing the ord "evacuee." He asked the City to consider the eat and steady markets that can be built out of "the ocessing of mud"—a raw material of which, in this untry, there is unlikely to be any shortage.

Mr. Anthony de Rothschild spoke of the need for balanced economy, and Mr. Charles Dukes, president f the Trades Union Congress, said that the Government ust ensure that goods produced under sweated condi- ions shall not unfairly compete with the products of abour on our own soil. Mr. J. Turner, president of the National Farmers' Union, thanked the medical profession or showing that agriculture should produce what is needed by the people rather than what it would like to produce. Agriculture, he said, was now straining at the eash to produce what the country really needs.

The address of the Association of Agriculture, which hopes to receive the widest possible support, is 32, Bedford Square, London, W.C.1.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED SEPT. 28

Notifications.—Smallpox, 0; scarlet fever, 1001; whooping-cough, 1451; diphtheria, 285; paratyphoid, [illegible]9; typhoid, 12; measles (excluding rubella), 1461; pneumonia (primary or influenzal), 373; cerebrospinal fever, 32; poliomyelitis, 30; polio-encephalitis, 0; encephalitis lethargica, 2; dysentery, 66; puerperal pyrexia, 164; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus was notified during the week.

Deaths.—In 126 great towns there were 2 (0) deaths from enteric fevers, 1 (0) from measles, 1 (0) from scarlet fever, 8 (1) from whooping-cough, 7 (0) from diphtheria, 47 (3) from diarrhœa and enteritis under two years, and 5 (2) from influenza. The figures in parentheses are those for London itself.

Willesden and Swansea each reported 1 death from an enteric fever.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 28 per thousand total births), including 20 in London.

Medicine and the Law

Insanity Moral or Legal

Since the Court of Criminal Appeal was created, an appeal thereto in all cases of conviction of murder has been almost automatic. The judges of that court indeed have sometimes found themselves saying that there is no explanation of a particular appeal except the fact that it is a case of murder. Neville Heath, sentenced to death at the Central Criminal Court on Sept. 26, has furnished an exception to the usual practice. He made no appeal to the Court of Criminal Appeal, but left his case to the medical board which the Home Secretary consults when the defence is insanity. Thus his fate will depend not on the narrow definition of insanity enshrined in the rules in McNaghten's case as long ago as 1843, but upon up-to-date medical opinion informed by all relevant evidence, whether or no the evidence was given at the trial.

Heath was convicted of the murder of Mrs. Margery Gardner at a London hotel on June 21. British justice requires that an accused person be tried for one offence only at one time, lest a jury be tempted to believe that, because he has been guilty of one crime, he is therefore probably guilty of another. Heath, as his counsel conceded, had also murdered Doreen Marshall at Bournemouth on July 4. The worse his conduct, the more material for a plea of insanity. For the defence Mr. J. D. Casswell, K.C., asked the jury to say that Heath was "as mad as a hatter, absolutely insane, a maniac." The conduct of the accused, who suffocated one of his victims, lashed her, and tied her up so that she was helpless, did not (urged counsel) show the premeditation of a sane person: no man in his senses could possibly have done what this man did; it was a case of sudden but latent insanity.

The expert testimony at the trial showed the usual conflict. Called by the defence, Dr. W. H. D. Hubert, psychotherapist at Wormwood Scrubs Prison before the late war, said that the injuries inflicted on the two women were extremely savage, the actions of a sadist. Heath, when visited in prison, appeared to show no remorse or appreciation of what other people would think of his behaviour; after committing these crimes, he behaved in quite a casual manner, considering his intelligence. In the witness's opinion, Heath was not an ordinary sexual pervert, but he suffered from "moral insanity" and at times was quite unaware that what he was doing was wrong; he was certifiable as morally insane. Under cross-examination Dr. Hubert described Heath as a moral defective in law, but, when referred to the statutory definition in the Mental Deficiency Act of 1927, he could point to no evidence of arrested or incomplete development of mind before the age of 18 years. In answer to the Judge, Dr. Hubert said Heath was suffering from a disease of the mind, a general abnormality; he suffered from a defect of reason inasmuch as he was unaware of other people's attitude towards these offences. Prosecuting counsel called Dr. Hugh Grierson and Dr. Hubert Young, senior medical officers at Brixton and Wormwood Scrubs prisons respectively. Neither considered Heath insane; he was a sadist, but sadism is an abnormal exaggeration of a normal instinct of the human race. Neither was prepared to agree that Heath did *not* know that what he was doing was wrong and punishable by law. For the defence it was suggested that these two witnesses were not consultants, had not practised in mental hospitals, and had experience only as prison doctors; they had found Heath repressed, uncommunicative, and uncoöperative because he knew that they were prospective witnesses for the Crown.

Mr. Justice Morris, in summing up to the jury, used the usual judicial definition of insanity. Everyone was presumed to be sane and responsible for his actions until the contrary was proved. Insanity was not established merely by outrageous and unexpected behaviour. This had been described as an instance of "partial" or "moral" insanity or as mental defectiveness. These were not the real issues. The judge emphasised that the jury must consider whether they thought that Heath did or did not know that he was doing what was wrong. It seems to have been upon this issue that he was convicted. The prosecution suggested that in his conversation with Miss Symonds about the crime, in his letter to Superintendent Barratt as to the identity of the criminal, in his change of name (to "Group-Captain Rupert Brooke") when he went to Bournemouth, and in his attempts to conceal the body of Miss Marshall, Heath had been trying to cover his tracks. These matters were among those mentioned by the judge as possibly material to the issue which they were trying. After a retirement of an hour they brought in a verdict of guilty. Heath, when called upon, made no statement and indeed showed indifference and unconcern.

The lay public was probably less interested in the issue of criminal responsibility than in the details of the crime. Heath's past career was narrated by a police witness in answer to questions by Mr. Casswell.

Born in 1917, he had served in the Territorial Army in 1934, and in 1936 had joined the Royal Air Force. He was dismissed by court-martial sentence next year, after trial for absence without leave, for escaping while under arrest, and for unauthorised taking of a motor-car. A month later he was placed on probation for frauds at an hotel and for attempting to obtain a car by false pretences, eight other cases of fraud being taken into consideration. In July, 1938, he was sent to Borstal on charges of stealing jewellery and cheque frauds, ten other cases being taken into consideration. He was released at the outbreak of war, enlisted in the R.A.S.C., and went to the Middle East in 1940 with a commission. In 1941 he was court-martialled and cashiered for frauds as to pay; there were other charges. Sent back to England, he landed improperly at Durban and found his way to Johannesburg where he posed as Captain Selway, M.C., of the Argyll and Sutherland Highlanders. Changing his name to Armstrong, he joined the South African Air Force as a pupil pilot, reached the rank of captain, and in 1944 was seconded to the R.A.F. and took part in operational flying. He had been married in South Africa in 1942; his wife obtained a divorce nine months later but with no suggestion of cruelty or sadism. In December, 1945, he was convicted by general court-martial in South Africa on various charges, including three for wearing decorations without authority. He was then sentenced for the third time to dismissal from the R.A.F. Returning to London last February, he was fined in April at Wimbledon for unlawfully wearing uniform and decorations to which he was not entitled.

How the recital of this record may have affected a jury it is difficult to say. There was little in it to suggest disease of the mind, and there was nothing in the case to suggest delusion.

In his recently published recollections Mr. Justice Travers Humphreys seems to deprecate taking away the decision in respect of a death sentence from the judges and giving it to the Home Secretary. Be that as it may, there will be considerable relief in many minds that Heath's strange case has forthwith been made the subject of a medical inquiry instead of merely leading to the repetition of the McNaghten rules in the Court of Criminal Appeal.

A GROUP of patients with disseminated sclerosis have initiated in New York the Association for Advancement of Research on Multiple Sclerosis, of which the chairman is Dr. Tracy Jackson Putnam, New York. The aims are to coördinate research, gather statistics, act as a clearing-house for information, educate the public on the problem of the disease, and collect funds for research. A large medical advisory board has been appointed.

In England Now

A Running Commentary by Peripatetic Co

THE latest experiments with yellow maize (*Lancet*, Oct. 5, p. 491) are a reminder that this winter marks the centenary of perhaps the experiment ever made with maize in human In 1846 the potato crop, the staple food of the poor, completely failed, and both the Government charitable organisations supplied vast quantities "Indian corn" or maize for cooking at home and up thousands of "kitchens," where the meal was before distribution at a nominal price, both to avo stigma of charity and to maintain the morale of the who were put to all sorts of road-making and hill- to earn money to buy the maize. For several afterwards hundreds of derelict wheelbarrows lay the roads and fields. Anthony Trollope, who has " back" so remarkably in the past few years, was the post-office surveyor, his job taking him over a part of the Irish countryside. He has left vivid tions of the ravages caused, especially among children, in his novel *Castle Richmond*. One wretche woman is made to say: "Is it the mail? An' shure a haven't I had it the last month past? Nothin' el Not a taste of a praty or a dhrop of milk for nigh a mont And now look at the childher. . . . They are dying the roadside." And she shows a child, aged nearly years, whose little legs seem to have withered awa its cheeks wan, yellow, and sunken; its head, and legs covered with sores. "Look at that," the mo says, almost with scorn, "that's what the mail has —my black curses be upon it, and the day that it came nigh the counthry."

* * *

The Royal Life Saving Society's handbook[1] make it all look so easy. Even the drowned man in bathing drawers wears a calm smile as the rescuer, someti disquietingly called the operator, pushes him in the shoves a knee in his chest, tows him ashore, leans on ribs, rubs his arms, rolls him over, and generally d him good. The rules for saving life were not always cut and dried; the drowned man is probably smili at the thought of what he escaped by being born after the society got down to its enlightened work. Dr Rowland Jackson, who published in 1746 *A Physi Dissertation on Drowning* (Price One Shilling), had such mine of information to draw on, and though his very first page he exclaims against "that ignor and unmanly Turn of Mind, commonly known by the Name of *Credulity*," he seems to have been led into accepting some pretty tall stories. There was the "Gardner of Froningholm," for example, who through the ice and "went perpendicularly to the Bottom, in which his feet stuck for sixteen Hours befo he was found." This sturdy fellow (for he survive said afterwards that he "perceived a Kind of Bladd before his Mouth which hindered the Ingress of the Water by that Passage, tho' it enter'd freely into Ears, and produc'd a Dulness of Hearing for Som Time after." Then there was the woman who had the misfortune to be thrice drowned. The first time she three whole days under water, "but the two other Ti had more Speedy Relief afforded her." She died at And so on, from the Painter of Falung, who was days in the water and had a good deal to say about to Laurence Jones, who continued seven weeks und water—though about him even Dr. Jackson seems to have felt a few qualms in his organ of faith.

From drowned men he passes to the drowned Pol swallows, who, on the word of Fortunus Licetus, toward the end of September "plunge themselves into Ditch and Rivers, where they remain conceal'd till about the Middle of May"; and clusters of these swallows tak out from below the ice only needed warming to come life again. Moreover, if released "they forthwith back to the Water and plunge themselves into it."

But Dr. Jackson's readiness to believe all he hea sprang from a human and practical desire to see th

---

1. Illustrated Handbook of Instruction (21st ed.). Royal L Saving Society, 14, Devonshire Street, Portland Place, Lond W.1. 2s.

ed resuscitated, and though nearly as credulous remedies as he is about recoveries, yet he gives lace to sensible measures. His opening directions carry the patient into a house and warm him ally before a gentle fire, wrapping him in warm and rubbing him until circulation is restored. He not believe in rolling patients on barrels because of his authorities had known it to cause sudden . He shares contemporary opinion on the value eeding but advises the utmost caution in the use rdials in the early stages. If other measures prove ectual he advises tracheotomy, and neatly describes method. If no tracheotomy tube is at hand the k of a common pipe—presumably a churchwarden— be slipped into the tracheotomy opening, and the ator (as the R.L.S.S. handbook would call him) ows into the Bole." He recommends another and h more extraordinary use for the common pipe, time loaded and burning. The small end is to be oduced into the anus, the bowl covered with a piece erforated paper, and the operator is then to blow cco smoke into the intestines as strongly as he ibly can. On one occasion, when this remedy was to trial at the instigation of a soldier, "at the fifth t, a considerable rumbling in the Woman's Abdomen heard, upon which she discharg'd some Water from Mouth and in a Moment after return'd to Life." Jackson was so much impressed with reports of this hod that he invented an instrument, illustrated in frontispiece, "contriv'd on purpose for impelling Smoke of Tobacco into the Intestines." It enables blower to operate from a distance of some , but has no advantage for the patient unless, the users of cigarette-holders, he prefers his smoke . One look at it is enough to prove that we ould all be very grateful to the Royal Life Saving ciety.

When my fellow peripatetic of Sept. 21 spoke of "swanning" he stirred up many memories of days in the Western Desert with the 8th Army, including one which throws light on the origin of the term. In the second desert campaign of November, 1941, a variety of codes were used for R.T. communication by the different branches of the Service. One of these, known as the "Bird" code, and originating, I believe, with the then D.D.M.S., 30 Corps, for use by medical units taking part in the campaign, referred to motor ambulances as "swans." One of the commoner sights in that campaign being ambulances crossing and recrossing the desert, "swanning" came to be applied to their activities. The term persisted, eventually becoming common 8th Army slang for any apparently aimless wanderings. From the 8th Army it diffused outwards to the rest of the Army, carried no doubt by old members of the 8th.

* * *

How tantalising it is to travel in the train past fields full of mushrooms, knowing that all we shall get this season is a quarter of a pound of tasteless cultivated things costing several shillings. We are still very conservative in this country about eating fungi other than the common mushroom, mainly because of the fear of poisonous toadstools, though Mr. Ramsbottom says in the *Times* that the toadstool is becoming more fashionable. His excellent King Penguin book on poisonous fungi shows how uncommon dangerous forms are, for he has to fill up his slim volume with kinds which are liable to give slight indigestion. Personally I don't think that we miss a great deal by our conservatism. To my palate few compare in flavour with a freshly gathered field mushroom, and in England it is an awful job to pick enough of other sorts to produce a decent portion. Even in France I have been faced with a repellant dish resembling tenderised 'Sorbo' rubber in the guise of a great delicacy.

Parliament

THE BILL IN THE LORDS

ACCOMMODATION in the smaller but by no means amped quarters now used by the House of Lords—hose proper benches are still occupied by the Commons was taxed to capacity when last Tuesday afternoon e LORD CHANCELLOR rose from the Woolsack to pen for the Government the Lords' debate on the econd reading of the National Health Bill. There was othing in Lord Jowitt's speech to suggest that during he parliamentary recess the Government has considered any revision of the Bill. Most of his survey and is arguments followed the now familiar lines of ministerial speeches in the lower House. The one new fact e disclosed was that the Government (adopting a suggestion of which Lord Moran had given notice) propose to et up a "Spens Committee" to consider and report pon the proper remuneration of consultants. He efended at length and with conviction the powers iven to the Minister under the Bill—powers without which, he said, it would be impossible for the Minister, s commander-in-chief of the health forces, to provide he service the country has been promised.

It was to these same powers, vested in one individual, hat the Earl of MUNSTER, opening for the Opposition, ok strong exception. He welcomed the conception f a National Health Service but was very sure that a etter and more democratic service could have been ramed if greater use had been made of local authorities. He hinted that his party would be putting down amendments in the committee stage designed to liberalise the dministration and preserve the autonomy of the oluntary hospitals.

The Marquess of READING saw in the Bill the logical levelopment of the social services inaugurated by the Asquith "Government of all the Talents," but feared the possibility of over-centralisation of administration in a Ministry of Health already overburdened with housing responsibilities. He believed that, with adequate devolution of power and function to the regional boards and to the executive councils, a service may be built not unsatisfactory to the doctors. He suggested that when the time comes it may be only the very few—and they the very elderly—who will prefer to "reign in Hell rather than serve with Bevan."

The Archbishop of YORK saw in the Bill a great opportunity for ensuring that preventable illness does not go unprevented. He was followed by the first of the medical speakers, Lord MORAN, who dealt with the need for establishing conditions of practice, in all branches of the profession, that will ensure the continued recruitment of the right men and women in numbers sufficient to provide a complete and balanced service. At present (but this may be partly due to demobilisation) the would-be entrants to the medical schools are more than the schools can absorb. If medicine is to remain attractive, conscious effort is needed to make all branches of medical work satisfying. In particular, the provision of an extended consultant service should not be allowed to exclude the general practitioner from his proper access to, and share in, the work of the hospitals. Lord Moran referred to the present difficulty in which the Minister finds himself in his negotiation with the Insurance Acts Committee. He felt this was largely a procedural difficulty which with good will could still be overcome. He appealed to the Minister to try again to come to some agreement with the profession before prejudice over this present trouble mars the reception of the final scheme.

Lord TEVIOT, speaking from knowledge gained from his long chairmanship of the Teviot Committee, stressed the even greater need for attracting urgently and by all possible means many more students to dentistry. The country, he said, could well afford to have each year three times the number who now qualify.

Lord INMAN saw in the new service not the death of the voluntary hospitals but enlarged opportunity free from all-pervading worries about finance. Lord HORDER regretted the lack of real consultation with the medical profession in the preparation of the Bill, and was glad that the Minister at last realised that there can be no new service without the willing coöperation of the men and women who have to work it.

The first day's debate ended with a plea from Lord AMULREE for a better, a more scientific, and a more humane treatment of the problem of the chronic sick.

The debate continued on Wednesday, when Lord LISTOWEL replied for the Government to the first day's critics.

Letters to the Editor

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—Some twelve months ago I had the opportunity of visiting Professor Winkelbaum's clinic in Graz. In his wards I noticed several patients with what he called perforated duodenal ulcer. They had not been operated upon. "Why?" I asked. The professor was obviously a little taken aback by so naive a question. The substance of his reply was that if the cases were brought into hospital early for treatment the ulcer sealed itself off. It was necessary to operate only on cases, usually late, in which there was evidence of a lot of fluid in the peritoneal cavity; and these were usually gastric, not duodenal ulcers. The routine was to await recovery from perforation, and in 3–4 weeks perform a partial gastrectomy.

Whether the latter action is commendable is a subject for debate. But the efficacy of the conservative treatment of perforation in these cases left no room for doubt, and made me realise that there was a great need for revision of the usual and long-established teaching of immediate operation for all cases of perforation: for the mortality of such a procedure is considerable, and the postoperative morbidity great.

Mr. Hermon Taylor's article of Sept. 28 is both timely and encouraging. The results—admittedly this is a small series—compare favourably with any that could have been obtained by routine laparotomy. It will be noted that nearly all the ulcers in Mr. Taylor's series were duodenal. Conditions for spontaneous sealing of a perforated duodenal ulcer are more favourable than those for sealing of a perforation on the anterior wall of the stomach; and I feel that if one is to adopt conservative treatment it may be wise to restrict it to duodenal ulcers, if differential diagnosis permits the distinction to be made.

London, W.1.

HAROLD C. EDWARDS.

SIR,—Although I have never had the courage to treat without operation cases of frank perforation of a peptic ulcer as practised by Mr. Hermon Taylor, I have frequently treated by generally conservative means those cases in which the diagnosis appeared somewhat indefinite and which appeared clinically to be cases of what we might call a local peritonitis in relation to an ulcer—such cases as are often referred to as "leaking ulcers." And in such cases the symptoms have subsided, though there has been noted from time to time a gas shadow under the diaphragm a few days later when a barium meal was about to be contemplated. This has led me to the conclusion that in many so-called perforated ulcers there has been a gas leak only, which can settle down with restriction of fluids by mouth for 24 hours and a dose of morphine without actually going to the trouble of gastric aspiration in this less severe type of case.

One other point I should like to mention, though it is not exactly relevant: it has been my experience that operation on late cases of perforation (i.e., those over 24 hours old) is almost inevitably fatal, but that a number of these cases may be saved by intravenous fluids coupled with a small suprapubic drain inserted under local anæsthesia. This form of drainage is recommended because I have always felt that a quantity of fluid plus gas inside the cœlom has kept the viscera of the upper abdomen apart and so prevented the falling together of those tissues, the apposition which might result in the perforation becoming sealed off.

Selly Oak Hospital, Birmingham.

JAMES GORE.

SIR,—I read Mr. Taylor's paper with great interest. Thirty years ago I reported a case in which perforation of an ulcer of the lesser curvature was cured by non-operative treatment.[1] The ulcer, having perforated between the layers of the lesser omentum, was observed by radiography; the perforation disappeared, and later the ulcer greatly diminished after routine dietetic treatment. So far as I am aware this was the first case in which gastric perforation was deliberately treated medically without operation, as noted previously by me.[2] The X-ray pictures of the ulcer before, during
after the perforation have been published in my
book.[3] Many years later Prof. M. Roch,[4] of
reported a case of "spontaneously healed
perforation."

Conservative treatment should be restricted to
perforations which are sealed off. Therefore the q
arises of how these cases are to be recognised
partial or total absence of muscular rigidity
be regarded as pathognomonic of a sealed perf
since rupture of an ulcer sited on the posterio
of the duodenum or of the stomach induces pri
rigidity in the musculature of the *posterior* abdo
wall. Only later, mostly after 2 or 3 days, with
appearance of meteorism, and intestinal obstructio
it possible to make a certain diagnosis of diffuse p
tonitis, indicating that the perforation was not sealed
An operation at that stage, however, carries a great ri

Hitherto it has not been known, or even suppo
that in most cases the perforation was sealed off. T
value of Mr. Taylor's treatment will be enhanced if
early and reliable sign differentiating between op
and sealed perforations can be found.

Letchworth.

EUGENE ROSENTHA

CHILDREN IN DAY NURSERIES

SIR,—Dr. Menzies, in her paper of Oct. 5, quotes m
as having described the Oxford survey of the inciden
of infections in day nurseries as being "at the sa
time too scientific and not scientific enough." Th
suggests a serious misunderstanding of my comme
which were, actually, that the Oxford survey was
much of an academic exercise and was based on d
whose scientific validity was open to serious doubt

I use the term "academic exercise" to describe
type of investigation which draws inferences fr
observed facts but does not concern itself with th
practical importance or application of those inferen
and it is with regret that I notice that other investigat
into the welfare of nursery children seem to share th
character.

The recent paper on the incidence of infections of th
respiratory tract, published by a group of members
the Medical Women's Federation, though unimpeachab
so far as data and analysis were concerned, is a case
point. Its findings were, in brief, that a child who lea
home to enter a nursery runs thereby a serious risk
catching colds or bronchitis. But it has been a matte
of common knowledge for years that the child's fir
departure from the restricted circle of the home to ent
a mixed group is likely to be followed by a series of col
and coughs. The two pertinent questions, "What is th
long-term effect on the child's health of these colds?"
and, "How much harm is done by shifting this pha
of infection from the normal school entrance age
4–5 years to the earlier age of 1½–2 years," remai
unanswered.

Dr. Menzies is concerned because in her nurseries
the gain in weight of the entrants is "unsatisfactory."
Her anxiety would be pardonable if the children were
being fattened for the pot, but it is rash to suggest th
at this particular stage in a young child's life it is possi
to lay down arbitrary standards of satisfactory gain
purely physiological grounds. It is quite true that l
of weight may arise from emotional disturbance.
may also arise from a change of diet, from a change fr
a bad diet to a good one, or from the fact that the chi
for the first time taking adequate exercise and discover
the open air, is merely getting rid of his "puppy fat."
It is difficult, if not impossible, to assess whether eit
the emotional disturbance or the failure to gain wei
is, in any given child, likely to cause long-term har
and Dr. Menzies is not to be blamed for not havi
attempted it. Yet without such an assessment h
investigation is barren.

Can we be realistic about this nursery business?
majority—often a large majority—of nursery childre
are the children of mothers who are compelled to wo
either by poverty or by the needs of industrial reco
struction. It is fallacious to compare nursery childr

---

[1] Rosenthal, E. *Berl. klin. Wschr.* 1910, no. 34.
[2] Rosenthal, E. *Lancet*, 1936, i, 1263.
[3] Rosenthal, E. Diseases of the Digestive System, London, 191
p. 72.
[4] Roch, M. *Schweiz. med. Wschr.* 1912, 72, 1307.

ildren from normal homes; the true comparison children from necessitous homes and children e cared for by "daily minders." I should be to see a state of things in which no woman with l under the age of two years was compelled by or economic circumstances to go out to work, Dr. Menzies finds me "biased in favour of nursery ion" it is a bias in favour of the nursery as against isfactory alternatives. I plead guilty, also, to a gainst unpractical "research" and would suggest questions with which future ambitious researchers profitably occupy themselves.

What is the relationship of infection in nursery days to s or physical defect in later childhood?

Does the school record of ex-nursery children suggest their "social training" in the nursery has helped them rd social adjustment?

Does the comparison of infection-rates in different ries, and possibly in different towns, suggest that certain diable factors are associated with high infection-rates?

ut there is, as yet, no totalitarian suggestion that all dren, from rich families and poor, shall be comorily drafted into nurseries at the age of six months, therefore no need to discuss whether nurseries are re not an evil in themselves. In point of fact, nurseries our present therapy for an admitted social evil, and concern should be to investigate their work conctively with the intention of improving them.

ccrington. **JOHN D. KERSHAW.**

ARSENICAL CHICKENPOX

SIR,—Dr. Parkes Weber (Sept. 14) may be interested an account of arsenical polyneuritis in a family, of whom developed both local (segmental) and eralised zoster 12 and 19 days respectively after estion of arsenic (*London Hosp. Gaz.* July, 1946, 144, and Clinical Supplement, September, 1946. xiv).

This case supports the theory of activation by arsenic a latent virus infection, since the zoster rash appeared days after a single dose of arsenic. This is the usual ubation period of the naturally occurring disease, that if the cause were exogenous exposure must have en place at the same time as the poisoning—which mprobable. The postulated selective action of arsenic the pyruvate enzyme system of cells, interfering h their normal oxidation, may possibly explain assumption of activity of a cell parasite such as a us.

oughton, Essex. **A. L. CRADDOCK.**

WOMEN IN MEDICINE

SIR,—In reply to Dr. Usborne's letter of Sept. 28, should be stated that, apart from direction of the ecently qualified, it was not found necessary to direct edical women, except perhaps in a few isolated cases, ince those available by age for direction were either lready employed or were not liable. It would seem, herefore, that those medical women who resumed work fter definite intervals of retirement did so in spontaneous esponse to the urgency of the times and the increased opportunities for work, especially in part-time posts uitable for those with family ties.

ANNIS GILLIE
mley, Kent. Hon. Secretary, Medical Women's Federation.

USE OF REASSURANCE

SIR,—For some time I have been experimenting with a method of explanation and reassurance designed for long-standing and severe psychoneurosis.

It consists in a short elementary and ad-hoc quasi-correspondence course on the effect of emotion on bodily and mental functioning. On each visit the patient is given a lesson stencilled on a sheet of paper with a large blank space. He takes this home, studies it, and writes on the blank space examples, illustrating the point of the lesson from his own experience and what he knows is the common experience of others. On his next visit these examples are discussed and he is given the next heet, which is dealt with in the same manner, and so on to the end of the course.

Thus the patient teaches himself, with only the minimum of guidance, to understand his illness, or rather, to arrange, in relation to his own symptoms, knowledge which he and everybody possesses about the effects and manifestations of emotion. The reassurance that the patient feels is all the stronger because the explanation has been arrived at by himself.

I hope to publish a full account of this method in the near future.

Graylingwell Hospital, Chichester. **M. B. BRODY.**

ROYAL MEDICAL BENEVOLENT FUND

SIR,—Christmas once again draws near and it is time to ask the hospitality of your columns to launch our annual Christmas appeal on behalf of the poor beneficiaries of this Fund.

The reasons for this appeal are now well known to all your readers and there is no reason to stress them again. I would rather emphasise the point that they are as cogent as ever. It is true that the old-age pension which is now in force, whilst making the financial position of old people more bearable—whereas previously it was quite intolerable—still means that the actual increase in annual income is only £41 12*s*., which, bearing in mind the tremendous increase in the cost of living, still makes the position of the poor housewife very difficult indeed. Further, very many of our beneficiaries are under 70 years of age and so not able to draw this pension. Lastly, there is that very real sense of being "not forgotten" at the festive time of Christmas, and the knowledge that our Christmas gift will ensure the purchase of a few extra luxuries which just make all the difference.

I recall that my appeal last year for £2000 to enable the Fund to give £4 to every beneficiary—a record sum for which I scarcely dared to hope—actually reached the grand total of £2127, and I know every generous donor will feel amply repaid by the gratitude and pleasure these gifts have evoked. May I venture to plead for a similar sum this year? I feel sure that, although I well recognise that times are very difficult for everybody just now, the still greater difficulties and anxieties of our very poor brethren will not pass unheeded.

Please forward contributions marked "Christmas Gifts" to the secretary, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, who will gratefully acknowledge.

ARNOLD LAWSON
London. President, R.M.B.F.

MEGALOBLASTIC ANÆMIA IN CHILDREN

SIR,—In your annotation of Sept. 28 you say that "ordinary crude [liver] extracts should be used and not the purified extracts specially designed for the treatment of pernicious anæmia, like 'Anahæmin.'" If it is implied that crude liver extracts administered *parenterally* provide a reliable method of treatment in cases of megaloblastic anæmia in children, I wish to dissociate myself from this view. From my own experience, and from my reading of the literature, it seems that oral liver therapy is by far the most effective and certain therapeutic measure hitherto available, not only in megaloblastic anæmia of childhood but in other types of megaloblastic anæmia proving refractory to refined parenteral liver extracts—with the possible exception of tropical nutritional anæmia, in which autolysed yeast may be preferred on the score of cheapness.

Your annotation quotes the case of a boy of 14 years, previously reported by me, in which "a purified liver extract was ineffective, but proteolysed-liver by mouth and a crude liver extract parenterally produced a remission. . . ." In my original report, however, it was pointed out that the crude parenteral extract 'Plexan' was ineffective, the condition relapsing with this treatment but responding when it was replaced by proteolysed liver given by mouth.

I am aware that claims have been made, from time to time, for the superiority of 'Campolon' to more refined parenteral liver extracts in the treatment of certain types of megaloblastic anæmia. Opinion on this question, however, is by no means unanimous. Nevertheless, if it be accepted that genuine crude liver extracts prepared by the Gänsslen or some similar process may in certain cases be more effective than purified extracts, I feel that your advocacy of "ordinary crude extracts" may be dangerous and misleading, since the various preparations on the market vary considerably in their constitution and mode of preparation. Some of them appear to differ from refined extracts mainly by their greater content of water.

Regarding the type of oral liver therapy effective in megaloblastic anæmias, including those of childhood, refractory to injections of refined extracts, my own experience has demonstrated the efficacy of proteolysed liver ('Hepamino') in daily doses of $1^1/_2$ oz., but a few recent trials suggest that oral liquid liver extract, now generally available once more, may prove equally efficacious.

Muirhead Department of Medicine, University of Glasgow. L. J. DAVIS.

EXTRANEOUS CAUSES OF UTERINE BLEEDING

SIR,—Nobody will quarrel with your advice to the gynæcologist, confronted with a case of menorrhagia, to bear in mind the various systemic conditions which may cause this symptom (Sept. 28, p. 460). But if you include idiopathic hypochromic anæmia among the extraneous causes of uterine bleeding, are you not putting the cart before the horse?

Bethnal Green Hospital, London, E.2. HERBERT LEVY.

THE NATIONAL LOAF

SIR,—The fact that an attempt has been made to keep secret the instruction to force us to swallow extra doses of calcium, as revealed by Sir Ernest Graham-Little's letter of August 17, is in keeping with other strange methods employed in this business.

Originally the scheme applied to white bread, which does not contain phytic acid, and not to brown; the idea underlying the proposal was to prevent osteoporosis among the adult population. The authority concerned was challenged to produce a dozen cases of calcium deficiency in adults (*Lancet*, 1941, ii, 25) but did not do so. The proposal to adulterate white bread had to be dropped. But evidently the authority in question felt that its amour-propre had suffered by the failure of the Food Minister to act on its suggestion. In such circumstances the phytic acid bogy was resurrected, and now it was maintained that only brown bread needed fortifying and not white. But the American "Council on Foods" in 1937 came to the conclusion that "there is no good evidence for the existence of a decalcifying factor in cereals" (quotation from *J. Physiol.* 1942, **101**, 304). Long after the recommendation to add calcium was made it was sought to justify this recommendation. The first paper by McCance and co-worker was received by the *Journal of Physiology* in October, 1941 (*J. Physiol.* 1942, **101**, 44). But in a paper received in April, 1942, by that journal these workers had to admit that their first paper was inconclusive, because "brown bread had a laxative action," and the negative calcium balance therefore might have been due to this factor. Still no justification! A new investigation therefore became necessary. No-one would hang a dog on the type of evidence offered in the second paper. Thus it was virtually admitted that at the time the recommendation was made to add calcium to bread there was no valid reason for the proposal. Otherwise there would not have been a call for the two papers. It should be borne in mind that the recommendation was made years before the appearance of these two papers. A more damning admission it is difficult to imagine. Years after the recommendation, and after an investigation, the workers had to admit that the evidence to justify the proposal was inconclusive. To force forty million human beings to consume extra doses of so potent a substance as calcium without valid reason is surely an amazing procedure! Furthermore, Mellanby himself admitted that much of the phytic acid is destroyed in the process of baking (*Nature, Lond.* 1944, **154**, 394); and people usually eat baked bread.

Again, when bread became whiter the Minister of Food stated in Parliament, in reply to a question by Sir Ernest Graham-Little: "The addition of calcium to the loaf was retained when the extraction-rate was reduced to 80% in order to ensure good intakes of calcium as a beneficial nutritional measure" (House of Commons, Feb. 20, 1946). When the bread was dark it was phytic acid that required calcium; when it became whiter it was calcium deficiency in dietary calcium; and now it is again phytic acid.

If the authority who recommended the adul our bread has a good case, why this twisting and and concealing? The subject is of grave and, in the interest of public health, an indepe inquiry into the whole matter by a competent long overdue.

Liverpool. I. H

CHILDREN WHO SPEND TOO LONG IN

SIR,—The view that some children who are on th all day need longer sleep is, I think, a relic of the before metabolism became an accurate science. If true, why is it that as the child gets older and his ca expenditure goes up he needs less and less sleep? view may arise from the confusion of length of with *intensity or depth of sleep and with ability to* asleep easily. Activity certainly leads to easy s During the examination of parents I find repeat that these three factors are tied up in confusion from meaning the same thing, length and intensit sleep are vaguely in inverse proportion to one anothe

Whatever may be practicable in the home, it is m more satisfactory to arrange the children's hours in according to age-weight grouping than *according* "activity." Mothers require guidance *in this* ma particularly during the first three years of a child's for it is then that the effects of the long tran period from animal polyphasic sleep to human m phasic sleep are most intense and most badly handle

Westcliff-on-Sea. JOHN A. MCCLUSK

Obituary

WALTER LANGDON-BROWN

KT., M.D. CAMB., SC.D., LL.D., F.R.C.P.

IT is perhaps as a teacher in the profession Sir Walter Langdon-Brown will be best rememb When he died on Oct. 3 he was 76 years of age was still capable of influencing and inspiring men, because maturity never impaired the of his mind. Holding high professional position physician at St. Bartholomew's and regius profes Cambridge, he could yet be intellectually unconventi and he showed courage as well as skill in advoc unfamiliar ideas.

Press Portrait

His father was the Rev. John Brown, Con minister at Bedford, who wrote what has become standard life of John Bunyan. Born at Bedfor August 13, 1870, he was named after his mother's uncle, J. Langdon Down, physician to the London Hospital. Thus heredity contrived to blend in him those diverse qualities that make for distinction in medicine and literary accomplishment. On leaving Bedford School he was too young to go to Cambridge, where he had won a scholarship at St. John's College, and he spent a useful year at Owens College, Manchester, working at biology under Milnes Marshall. At Cambridge he took a first in both parts of the natural sciences tripos and won a Hutchinson research scholarship at his own college. The thorough training in physiological principles and thought which he gained was the background of his medical career, enabled him to consider his clinical problems wi scientific approach and to teach with an except clarity.

Entering Bart's with the senior science schola in 1895, he qualified in 1897, and in the same year be house-physician to Samuel Gee, one of the best cl teachers of his time. In 1899 his bent towards physi m to become junior demonstrator in physiology, two years he was senior demonstrator. At the same he continued his clinical work and teaching in the of casualty physician and demonstrator of practical cine. In 1906 he relinquished his appointment in hysiological department to become medical registrar lemonstrator of morbid anatomy; but it was not until at the age of 43, that he was elected to the senior as assistant physician. He became a full physician)24, and retired from Bart's in 1930, but continued some time to work at the Metropolitan Hospital to h he had been appointed at the beginning of the ury.

angdon-Brown was widely read on many subjects. his ward rounds were enlivened and illustrated references to English literature. From early in his eer he was especially interested in endocrinology and wed his originality of thought, and he was one of first to draw attention to the similarity of the tures produced by lesions of the anterior pituitary 1 of the adrenal cortex, some years before Cushing scribed the syndrome associated with pituitary sophilism. The importance which he placed on a owledge of physiology in the practice of medicine is ected in his Croonian lecture, delivered at the Royal llege of Physicians in 1918, on the Rôle of the mpathetic Nervous System in Disease, and in his st-known book, *Physiological Principles in Treatment*, st published in 1908, and now in its eighth edition. him, more than to any other man in recent years, longs the credit for teaching medicine as applied ysiology, and he introduced successive generations of dical students and doctors to the new facts and ideas which physiology was so prolific between the two rs. If he sometimes, perhaps, over-simplified the ysiology, this was the result of those qualities which de him such an excellent expositor. His attention things of the mind led him naturally to consider minds of his patients, and the close linkage between endocrine glands, the autonomic nervous system, and emotional life brought him face to face with this ect of the body-mind relationship. He was thus ioneer of what is now called psychosomatic medicine, ugh he was not much interested in the more recondite ools of medical psychology and preferred the simpler proach of Adler.

From the first Langdon-Brown showed himself a fertile iter with an unusual range. He was joint editor of *e Practitioner's Encyclopædia of Medical Treatment*, blished in 1915; and his own works included *The mpathetic Nervous System in Disease* (1920), and *The docrines in General Medicine* (1927). All these had a actical application to the art of clinical medicine, of ich he was a master. His wide learning, his breadth vision, and his erudite style are seen at their best in *us we are Men* (1938), which examines human nature, d in *Some Chapters in Cambridge Medical History*, a all gem at which he laboured with increasing difficulty ring the last year of his life. He had a sense of history ich constantly illuminated the present with the past. me of his lectures and occasional writings, such as *he Pursuit of Shadows*, deserve to survive as models their kind, for he brought wit and elegance as well culture to the discussion of clinical problems.

At Cambridge, because of age-limit rules, he occupied e regius chair for only three short years, from 1932 1935, but he faithfully maintained its great traditions. loved Cambridge, with which he was intimately sociated by many ties of relationship. "In his own ofession," writes L. W., "there can have been no an better known or better loved by young and old ike. It was revealing to be his co-examiner and to note now many candidates he would put at their ease at the beginning of a viva by inquiring whether they were he sons of his medical or lay friends. His wisdom, his experience, and his counsel were always available to the undergraduate, the newly qualified, or the embryo professor, and many sought his advice, always kindly nd patiently given however trivial the problem." All Bart's men," A. W. S. writes, "will call to mind -B.'s arrival in the square for his ward round at ten minutes to two, with cigar, not yet fully smoked, that nd to be discarded. On his rounds the opinion and argument of anyone, however lowly, were always carefully considered, and his kindly manner endeared him to his housemen and students. He would never hesitate to seek the opinion of a junior on a matter about which there was some doubt: humility is one of the marks of a great man, and this L.-B. had. Of him can be said what Sir Norman Moore has said of his old chief, Samuel Gee, 'He was a constant friend and a pleasant companion, a learned physician, and a most excellent teacher'."

At the Metropolitan Hospital, as well as Bart's, he was a tower of strength. A colleague there, P. H., speaks of "his constant endeavour to relate clinical observation to physiological knowledge and to bridge the gap between the laboratory and the ward," and recalls that he was one of the first in this country to apply the work of Pavlov on gastric secretion and the teachings of Lenharz to the treatment of patients suffering from gastric and duodenal ulcer. "He inspired his house-physicians with a scientific attitude while at the same time taking a broad view of the problems of the individual patient."

The same theme is again repeated by another and younger associate, R. G. "Langdon-Brown," he says, "was one of the first, perhaps the first, of modern physicians to attempt to apply to clinical medicine the teachings of modern physiology—the physiology, that is, of the present day rather than of his student days. He acted as a catalyst between the laboratory and the ward, and this line of thought inevitably led him to endocrinology as a major interest, endocrinology not as a specialty (for his was too Hippocratic a view for the admission of a specialty) but as a tool to the better understanding of medicine as an indivisible whole. For this reason he gave his support to the formation of a section of endocrinology of the Royal Society of Medicine, and, knowing his end was near, was happy to see it in being in time to become its first president. He was too ill to read his inaugural lecture, but not too ill to write it. His mind was unclouded to the end and only a few days before his death he was able to remember full details of a case not seen for years." In this last presidential address he described the development of endocrinology, adding "I ventured to call the pituitary gland 'the leader of the endocrine orchestra,' though it later transpired that the hypothalamus holds the still more important rank of conductor." This now celebrated simile is an indication of his aptitude for exposition.

His wisdom was broadly based in experience. As a young man he served in the South African War as senior physician at the Imperial Yeomanry Hospital at Pretoria, contributing later to the book on *Imperial Yeomanry Hospitals in South Africa*, and he kept up his military associations as a Territorial. As a young man, too, he lectured to working men's institutes on biology and physiology. Afterwards an examiner in many universities, he went to Egypt in 1936 on behalf of the General Medical Council to report on teaching and examinations as there conducted, and he presided over the Committee on Postgraduate Training in Psychological Medicine which reported in 1943. Through his multifarious activities he came to know an immense number of people, and he was a charming host with a great knowledge of good food and good wine, a vast fund of anecdote, and a gift for stimulating conversation. "One remembers him sitting in his combined consulting-room and study in Cavendish Square, surrounded by cats, or standing like a rock in a seethe of more mobile persons at some medical meeting. He said many good things, which he enjoyed as much as his hearers. He was a humanist in every sense of the word: 'in mind, as in body, he was *totus, teres, atque rotundus*'."

Langdon-Brown's distinction and industry brought him many honours. Elected a fellow of the Royal College of Physicians in 1908, he became senior censor and delivered the Harveian oration of the college in 1936. He was a fellow of Corpus Christi College, Cambridge, and received honorary doctorates in science from Oxford, and in law from the National University of Ireland, and from Dalhousie University, Canada. The Royal College of Physicians of Ireland elected him an honorary fellow in 1940, and he was also an honorary fellow of the Royal Society of Medicine, the Faculty of Radiologists, the Hunterian Society, and the Harveian Society, and

Notes and News

ON THE RECORD

March Westminster Hospital broke new ground by ding a department of medical photography under the ie charge of a doctor. This week the department has a exhibition. Part of its work is to help in clinical gation by enabling the staff to keep permanent visual s and to compare serial studies. But it also caters for the student; already one film (on inflammation) een made, and others are planned. For tutorials, graphic displays—on gout, for example—are arranged; onsiderable use is made of filmstrip, which is shown, g other purposes, as replacing the familiar lantern-slide. a projector that can be fitted easily into a suitcase, res are reproduced on a screen up to any magnification the light will allow. A lecturer can carry 300 pictures ft. of 35 mm. film, weighing no more than an ounce; and hose that choose to vary the order of their showing, the can be divided and the pieces mounted as for a lantern-, but without the lantern-slide's cost, weight, and fragility. ie exhibition shows clearly enough that photography has 1 to offer both student and doctor; it may, perhaps, ipt others to follow the Westminster Hospital's lead.

A NEW JOURNAL OF ANÆSTHESIA

E Association of Anæsthetists is launching a new quarterly ial, *Anæsthesia*, of which the first number has appeared month. Edited by Dr. C. Langton Hewer, assisted by R. Blair Gould, the journal will be primarily scientific, t will also publish official news of the association. "It become obvious," writes the editor, "that the rapid rance in all types of anæsthetic and analgesic technique uires fuller and quicker expression than can be provided the overloaded columns of the general medical press." Alfred Webb-Johnson, P.R.C.S., in a foreword, remarks the fitness of this, the centenary of the first operation under ieral anæsthesia in this country, as the year for initiating venture. Among other papers are an account of the ociation since its inception, by Dr. H. W. Featherstone, first president, and a sketch of anæsthetic practice a ndred years ago by Dr. A. D. Marston, who is now president.

NARCOTICS CONTROL

THE Drug Supervisory Body and the Permanent Central ium Board, which were established under the auspices of e League of Nations for the international control of narcotics, e meeting in London this week and next. The Economic d Social Council of the United Nations has lately agreed that e present members of these two bodies should be invited to ntinue for the time being in office. The British repre-ntative is Sir Malcolm Delevingne, who is chairman of the rug Supervisory Body.

Iniversity of London

Mr. Frank Dickens, D.SC., F.R.S., has been appointed to the hilip Hill chair of experimental biochemistry tenable at the Iiddlesex Hospital medical school.

In 1923 Dr. Dickens was appointed first assistant in the Courtauld nstitute of Biochemistry at the school. From 1933 until this year ie worked at the Cancer Research Laboratory at the Royal Victoria Infirmary, Newcastle-on-Tyne, and he was research director for the North of England council of the British Empire Cancer Campaign. In March of this year he returned to the Courtauld Institute of Biochemistry.

Dr. Clifford Wilson has been appointed to the university hair of medicine tenable at the London Hospital medical llege, as from Oct. 1.

Dr. Wilson, who is 40 years of age, qualified from the London Hospital in 1931 and took his D.M. Oxfd five years later. After demonstrating in physiology at the London he went with a Rockefeller research fellowship to work at Harvard medical school and Boston City Hospital under Dr. George Minot. He returned to this country in 1935 and was appointed assistant director of the medical unit of the London Hospital in 1938. From 1939 to 1942 he was E.M.S. physician in the London Hospital sector, and from 1942 to 1946 he was on military service, attached to no. 2 Medical Research Section, G.H.Q., Home Forces. Last year he became acting director of the medical unit, London Hospital. Dr. Wilson is the author of papers on renal lesions in hypertension, and was associated with Prof. Arthur Ellis in work on Bright's disease on which Professor Ellis's Croonian lectures were based.

Dr. J. L. D'Silva has been appointed, as from Oct. 1, to the university readership in physiology tenable at St. Bartholomew's Hospital medical college, where he has been lecturer in physiology since 1944.

Mr. J. F. Danielli, D.SC., has been appointed to the university readership in cell physiology tenable at the Royal Cancer Hospital, as from Oct. 1.

Royal College of Physicians

The Charles West lecture will be delivered on Tuesday, Nov. 19, at 5 P.M., by Prof. J. C. Spence, whose subject will be the Care of Children in Hospital.

Royal College of Surgeons of England

Three lectures are to be delivered at the college, Lincoln's Inn Fields, London, W.C.2, by Prof. Alexander Lipschutz (Chile), who will speak on the Tumorigenic Action of Steroids and its Implication for the Problem of Cancer (Oct. 28); the Antitumorigenic Action of Steroids (Oct. 29); and the Steroid Balance and the Antitumoral Autodefence (Nov. 1). The lectures, which will be given at 3.30 P.M. on each day, are open to medical practitioners and advanced students.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council, held on Sept. 28, the following were admitted to the membership:

H. R. Arthur, S. J. Barr, B. E. Blair, Catherine I. Blyth, Joyce Burt, Harold Burton, G. B. W. Fisher (in absentia), R. L. Hartley, Derek Jefferiss, Iola L. T. Jones, L. W. Lauste, Margaret Orford, H. C. Perry, D. L. Poddar, Esther M. Pollock, J. E. Scott-Carmichael, E. W. L. Thompson, T. G. E. White.

At the end of the meeting Mr. William Gilliatt assumed the office of president, Sir William Fletcher Shaw and Mr. James Wyatt of vice-presidents, and Mr. A. A. Gemmell of treasurer.

Faculty of Radiologists

The following are the officers of the faculty for the present session: president, Dr. C. G. Teall (Birmingham); vice-presidents (radiodiagnosis), Dr. Peter Kerley (London), (radiotherapy), Dr. Robert McWhirter (Edinburgh); immediate past president, Dr. Ralston Paterson (Manchester); warden of the fellowship, Dr. S. Cochrane Shanks (London); treasurer, Mr. G. F. Stebbing (London); secretary, Dr. J. F. Bromley (Birmingham).

Research Defence Society

The annual general meeting will be held at 26, Portland Place, London, W.1, on Wednesday, Oct. 23, at 3.15 P.M. The Stephen Paget memorial lecture will be given by Prof. N. Hamilton Fairley, F.R.S., who will speak on War-time Research in Malaria and Other Tropical Diseases of Military Significance.

Tuberculosis Course at Newcastle

The Tuberculosis Educational Institute announces a refresher course, for medical practitioners and tuberculosis officers, at the Literary and Philosophical Library, Westgate Road, Newcastle-upon-Tyne, from Nov. 4 to 9. Programmes may be obtained from Dr. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1.

College of Pharmaceutical Society

Opening the college's 105th session in London on Oct. 2, Sir Percival Hartley, F.R.S., director of biological standards at the National Institute of Medical Research, recalled the valuable work undertaken by the health organisation of the League of Nations. The organisation had advanced the prospects of an international pharmacopœia—a project which had been under discussion for over half a century—and this year had published a report which could fairly be regarded as the nucleus of such a pharmacopœia. "My experience," he concluded, "has convinced me that international coöperation among men of science is not only easily secured but is a kind of natural impulse."

Hunterian Society

A dinner meeting will be held at Pimm's (3, Poultry, E.C.2) on Oct. 14, when Dr. J. B. Cook will deliver a presidential address on the Evolution of Municipal Medicine. On Nov. 18, at the Apothecaries' Hall, a discussion on the advertisement of proprietary medicines will be opened by Mr. Hugh Linstead, M.P. On Dec. 16, at a further dinner meeting, Dr. Geoffrey Evans will open a discussion on flatulence. The Hunterian lecture will be delivered at the Mansion House on Jan. 20, 1947, by Professor Debaiseux (Louvain), whose subject will be Hypotension in Intracranial Injuries. The annual dinner will be held at Grosvenor House on Feb. 13. On Feb. 24 Mr. Zachary Cope will deliver the Hunterian oration on Literature and Doctors, and on March 17 there will be a dinner meeting at which a discussion on Sprains and Strains is to be opened by Sir Reginald Watson-Jones.

Society of Apothecaries of London

Gillson Scholarship in Pathology.—This scholarship of £105 a year is open to candidates under 35 who are licentiates or freemen of the society or become so within 6 months. The regulations may be had from the registrar, Black Friars Lane, E.C.4.

Society for the Study of Addiction

On Tuesday, Oct. 15, at 4 P.M., at 11, Chandos Street, London, W.1, Dr. W. R. Bett will give an address entitled Poppies, Dawamesk, and the Green Goddess: an Exotic Study of Literary Genius.

Medical Society for the Study of Venereal Diseases

A general meeting will be held at 11, Chandos Street, London, W.1, at 2.30 P.M. on Saturday, Oct. 26, when Dr. F. R. Curtis will speak on Venereal Disease in Occupied Germany.

Food and Agriculture Organisation

Mr. S. M. Bruce, F.R.S., has been appointed chairman of the preparatory commission appointed at the F.A.O. conference in Copenhagen to examine methods for setting up a world food board (see *Lancet*, Sept. 28, p. 463). The first meeting of the commission will be held in Washington on Oct. 28. Mr. Bruce, who was prime minister of Australia from 1922 to 1929 and represented Australia in London from 1932 to 1946, took a leading part in the social and economic work of the League of Nations.

Centenary of Anæsthesia

Two further celebrations of the centenary of anæsthesia are announced to be held on Oct. 16, the anniversary of Morton's first operation at the Massachusetts General Hospital. At 2.30 P.M. there will be a special meeting of the history of medicine section of the Royal Society of Medicine at 1, Wimpole Street, London, W.1, when papers on the development of anæsthesia will be read by Prof. Charles Singer, Mrs. Barbara Duncum, Dr. Joseph Blomfield, and Dr. E. Ashworth Underwood.

After this meeting, at 4.45 P.M., Lord Moran will open an exhibition of anæsthetic apparatus and literature at the Wellcome Historical Medical Museum, 183, Euston Road, N.W.1. The exhibition will remain open until Dec. 31.

Middlesex Hospital Dinner

Presiding over the annual dinner held in London on Oct. 4, Dr. G. E. Beaumont spoke of losses from the honorary staff by retirement (Lakin, MacCormac, Cockayne, Gordon-Taylor, Webb-Johnson, Hastings, Greeves, Bankart) and by death (Voelcker, Berkeley, Bennett). He welcomed the appointment of F. Ray Bettley as dermatologist, O. P. Dinnick as anæsthetist, A. J. B. Goldsmith as assistant ophthalmic surgeon, R. S. Handley and C. J. B. Murray as assistant surgeons, P. H. Newman as assistant orthopædic surgeon, and Arthur Willcox as assistant physician. Mr. Plimsoll had been succeeded as secretary by Brig. Harvey Roberts. Meanwhile professors seemed to be sprouting on every bush, perhaps because of the wet summer; and the wisdom of the young suggested that original sin has been replaced by original knowledge. Dr. H. E. A. Boldero, as dean, spoke of changes in the medical school, including the retirement of Prof. S. Russ, the promotion of Dr. R. W. Scarff to be professor, and the return of Prof. F. Dickens, F.R.S., to the Courtauld Institute. By a happy innovation, Colonel J. J. Astor, succeeding Mr. Samuel Courtauld as chairman of the school board, would unite that post with chairmanship of the hospital. Dr. Boldero regretted the circumstances which obliged some of the young men who were to have entered the school this autumn to enter the Forces instead, and he hoped for a change of policy by which military service, if required, would follow completion of the medical course. During the war the school had admitted 80 students a year, and he hoped the number would rise to 100 as recommended by the Goodenough Committee; but this would be impossible until more preclinical accommodation was provided by rebuilding, and until the number of teaching beds could be increased. The board had bought a sizable piece of adjoining land which offered, said Dr. Boldero, "a very real additional opportunity for extension of clinical facilities under our own control." Dr. J. Marks, Broderip scholar, averred that the students had no complaints this year, and their athletic record was very satisfactory. Replying to his health, eloquently proposed by Sir Gordon Gordon-Taylor, the chairman said that his mention of the rowing club's difficulties had caused Sir Alfred Webb-Johnson to promise it a boat of its own.

Medical Diary

OCT. 13 TO 19

Monday, 14th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields W.C.
3.45 P.M. *Prof. A. J. E. Cave*: Anatomy of the Laryn
5 P.M. Dr. F. W. Roberts: Local Anæsthetics.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8 P.M. Sir Philip Manson-Bahr: Biological Basis of Medicine. (Presidential address.)

Tuesday, 15th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. E. L. Patterson: Blood-supply of the Brai
5 P.M. Prof. R. J. S. McDowall: Blood-pressure.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.
5 P.M. Dr. I. Muende: Fungus Infections of the Skin

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. F. A. E. Crew, F.R.S.: of Genetics in Clinical Medicine.

Wednesday, 16th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. E. L. Patterson: Cerebral Ventricular Syste
5 P.M. Prof. W. D. Newcomb: General Pathology of Bo

ROYAL SOCIETY OF MEDICINE
2.30 P.M. *History of Medicine.* Prof. Charles Singer: A in the Pre-anæsthetic Period (before 1846). Dr. Duncum: Development of Inhalation Anæsthesia in Second Half of the 19th Century. Dr. Joseph Blomfiel Modern Development of Anæsthesia (1900–35). Dr Ashworth Underwood: Contribution to the Early Hist of Anæsthesia in this Country.
5 P.M. *Comparative Medicine.* Prof. G. R. Cameron: Shift Body Fluids.

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Professor Phakomatoses.

Thursday, 17th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. E. L. Patterson: Cerebellum.
5 P.M. Prof. W. D. Newcomb: General Pathology of Bone

ROYAL SOCIETY OF MEDICINE
5 P.M. *Dermatology.* Cases will be shown at 4 P.M.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, P Place, W.1
8 P.M. Dr. C. J. Hackett: Clinical Course of Yaws in U

Friday, 18th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East
3 P.M. Sir Maurice Cassidy: Coronary Disease. (H oration.)

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. R. J. S. McDowall: Shock.

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Radiology.* Dr. Whately Davidson: Basis for St a Radiological Department. (Presidential address.)
8 P.M. *Obstetrics and Gynæcology.* Mr. James Wyatt: Fu Teaching of the Undergraduate. (Presidential addre

BRITISH ORTHOPÆDIC ASSOCIATION
9.30 A.M. (1, Wimpole Street, W.1.) Annual Meeting. Mr. N. Roberts, Mr. W. Gissane: Fractures of the Os Calc
11.30 A.M. Mr. George Perkins: Rest versus Activity in Treatment of a Fracture. (Presidential address.)
2 P.M. Short papers.

FACULTY OF RADIOLOGISTS
2.30 P.M. (*Royal College of Surgeons.*) Dr. Solve Welin (St holm), Dr. H. Graham Hodgson: X-ray Diagnosis Cholesteatoma in the Temporal Bone.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
7 P.M. (South Kensington Hotel.) Dr. G. S. Hovenden: F Years of General Practice. (Presidential address.)

Saturday, 19th

BRITISH ORTHOPÆDIC ASSOCIATION
9.30 A.M. (St. Thomas's Hospital, S.E.1.) Annual meeti continued.
10 A.M. Demonstration of cases.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS
10.30 A.M. (London School of Hygiene, Keppel Street, W.C Dr. Donald Hunter, Dr. R. S. F. Schilling: Indust Medicine in the U.S.A.

Sir Lionel Whitby and Mr. A. E. Porritt have accepted t invitation of Harvard University to occupy the chair medicine and surgery there for a short period. Sir Lio Whitby leaves for the United States next week.

In future the new quarterly, the *Journal of the History Medicine and Allied Sciences,* will be issued in this coun and the British Empire by William Heinemann Ltd., Lond The subscription in Britain is 50*s.* per annum or 12*s.* per single copy.

A warning against the uncontrolled use of a new dr 'Triodione,' for the treatment of epilepsy, has been issu by the American Medical Association, which states that t deaths have been reported in patients who were treat themselves.

CINOMA OF PROSTATE TREATED WITH ŒSTROGENS *

J. D. FERGUSSON
M.D. Camb., F.R.C.S.
RGEON, CENTRAL MIDDLESEX COUNTY HOSPITAL

E treatment of carcinoma of the prostate by castra- or by the feminising influence of œstrogens has been luced comparatively recently but already seems ole, in many instances, of giving greater relief than methods.

1935 an investigation into the origin of enzymes l in urine led to the discovery that the normal human tate is a prolific source of an acid phosphatase. her observations by Gutman and Gutman (1938) ed that this enzyme is only elaborated in appreciable tity by the mature gland. This significant finding later confirmed by Gomori (1941), who demonstrated hosphatase in adult prostatic epithelium by a special ing method. Subsequent research on pathological rial has established that a high percentage of nomatous prostates also produces large amounts of nzyme.

aggins et al. (1941) considered that these findings it that the majority of carcinomatous prostates con- epithelial cells of a highly differentiated type, capable aborating acid phosphatase. Acting on this assump- and with the knowledge that normal adult prostatic elium could be made to atrophy by removing the genital glands, Huggins advocated castration in treatment of prostatic carcinoma. The synthesis of ogenic substances by Dodds (1938) afforded an native and perhaps more humane method of treat- t; for, by their antagonistic action to androgen, these tances appear to induce a response similar to that ined by castration.

ÆTIOLOGY OF PROSTATIC CARCINOMA

ttle is known about ætiological factors in prostatic inoma, but, so far as I can ascertain, it has never en noted in a eunuch. The prophylactic implications re hardly likely to meet with universal approval, but it is t interest to compare this observation with the effect of astration on the established disease. Unfortunately the rity of prostatic cancer in animals has so far prevented ay confirmatory investigations.

TABLE I—REPEATED BIOPSIES IN PROSTATIC CANCER DURING TREATMENT WITH ŒSTROGENS

ase	No. of biopsies	Intervals between biopsies	Total dosage of œstrogens
1	4	5 months, 16 months, 1 year	6130 mg. S
2	2	30 months	3548 mg. S
3	3	10 days, 17 months	4380 mg. S
4	2	10 months	1792 mg. S
5	2	6 months	500 mg. D
6	2	1 year	1560 mg. D
7	3	39 days, 10 months	1150 mg. D
8	2	9 months	960 mg. D
[illegible]	2	16 days	200 mg. D
10	2*	23 months	4641 mg. S
11	2*	10 months	2326 mg. S

Biopsy supplemented by necropsy. S, stilbœstrol; D, dienœstrol.

VARIATIONS IN PROSTATIC CARCINOMA

The pathology, symptoms, and clinical course of rcinoma of the prostate vary widely. Differences in the cellular arrangements of the tumour are common, all gradations being met with, from anaplastic forms through glandular to scirrhous types. Even in the same prostate the histological appearance is seldom uniform, though this may be due in part to anatomical factors. I am prepared to believe that most growths originate in that portion of the gland lying below and behind the verumontanum; but, from a dissection of many adult prostates, I am now inclined to think that there is no well-demarcated posterior lobe. No part of the prostate need ultimately remain exempt, and in a high proportion of cases the growth is already widespread when detected. Very occasionally the reverse obtains, and a small area of unsuspected malignant tissue may be found in what was considered clinically to be an "adenomatous" prostate.

TABLE II—ACID PHOSPHATASE IN PROSTATIC TISSUE

Source	Acid phosphatase (King-Armstrong units per 100 g. of moist tissue)	
	Lateral lobe	Posterior part
Necropsy:		
Benign glands (6 cases)..	1410 960 8420 1900 2190 9800	4840 14,500 10,900 10,340 11,670 11,500
Biopsy:		
Benign glands (20 cases)	Average 7300; highest 15,600; less than 1000 in 4 cases	
Carcinomatous glands (14 cases)	Average 11,784; highest 28,200; less than 1000 in 1 case	

Differences in the dissemination of metastases are common and explain much of the disparity between general and urological symptoms. In this connexion I would emphasise the frequency of superficial lymphatic metastasis—a point liable to be overlooked.

Variations in the clinical course are determined largely by the metastases, and the disease may sometimes pursue a relatively asymptomatic course for years, only being detected at necropsy.

It is important to appreciate fully such variations before assessing the merit of any treatment.

TREATMENT OF PROSTATIC CARCINOMA

In a review of 1000 cases of prostatic carcinoma, Bumpus (1926) showed that two-thirds of the patients, if untreated, died within a year of coming under observation. If metastases were detected when first seen, this period was reduced to nine months.

With improved methods of treatment the average survival period became somewhat longer, but few procedures gave any constant relief. In some instances the complications of therapy proved a greater affliction than the disease. Many of the methods, however, remain of value, and, with the addition of castration and œstrogen therapy, now constitute the basis of treatment of prostatic cancer. Omitting radical prostatectomy as applicable in only a small proportion of cases, treatment in the remainder falls into three categories:

(1) *Palliation of symptoms by medical means.*—This is entirely non-specific and has no direct application to the growth.

(2) *The surgical relief of urinary obstruction* by urethral dilatation, cystotomy drainage, or perurethral resection. With œstrogen treatment, the indications for cystotomy drainage are becoming less frequent. It remains of value in patients almost moribund from uræmia, and in cases where involvement of the external urinary sphincter leads to incontinence.

(3) *The suppression of neoplastic activity* by radiotherapy, œstrogen treatment, castration, or irradiation of the testes.

It has been the experience of many observers that the addition of castration or œstrogen therapy is often followed by a degree of relief not achieved by other methods. This evidence, though significant in its volume, is necessarily based largely on the subjective statements of patients. A similar criticism may be levelled against the uncorroborated clinical findings of the surgeon, particularly those relating to repeated rectal examinations during treatment. In other words, though in many cases the giving of œstrogens is apparently accompanied by a satisfactory response, such an opinion is often open to the objection of the wish being father to the thought.

---

* Abridged from a Hunterian lecture given at the Royal College of Surgeons of England, June 13, 1946.

METHOD OF INVESTIGATION OF RESULTS OF ŒSTROGEN TREATMENT

Hoping to overcome such criticism, I decided in 1942 to carry out repeated biopsies of the carcinomatous prostate, and of any accessible metastases in suitable cases during continued œstrogen therapy. This method of investigation appeared of additional value in affording a positive control by means of which primary errors in the diagnosis of prostatic carcinoma could be definitely excluded—a risk which might otherwise lead to false claims for œstrogen therapy (Fergusson and Pagel 1945).

My preference for conducting this survey with œstrogens, instead of following the results of castration, was based on a hope that I might also discover the optimum dosage. Further, if such treatment proved ineffective, it would still be possible to resort to operation.

Opinion seems to vary geographically as to the value of retaining the male genital glands, and in many reports from transatlantic clinics a preference is expressed for bilateral orchidectomy. Such treatment is often mitigated and even embellished by the substitution of a plastic prosthesis, but the psychological effect is liable t disturbing. On the other hand, with pro administration of œstrogens the testicular atrophy loss of desire are more gradual and are accepted w equanimity seldom evinced after castration.

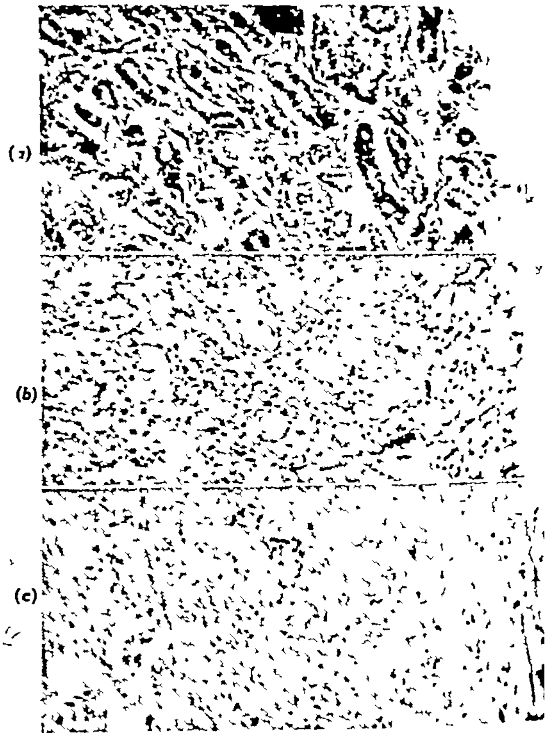


Fig. 2—Serial biopsy specimens of prostatic carcinoma during treatment, showing regression of tumour: (a) initial; 10 days; (c) 17 months later

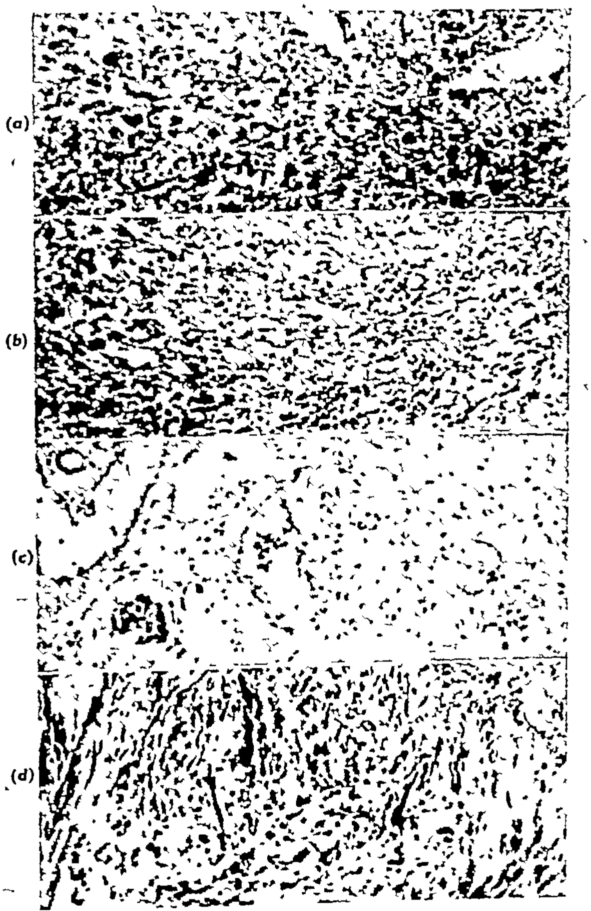


Fig. 1—Serial biopsy specimens of prostatic carcinoma during œstrogen treatment, showing regression of tumour and replacement fibrosis: (a) initial; (b) after 5 months; (c) 16 months later; (d) a year later.

When I started my survey during œstrogen I was unaware of a parallel investigation by Sc et al. (1942) conducted for two months in the U States, but my longer-term results agree closely theirs. I have since been able to corroborat histological findings by simultaneous estimations acid-phosphatase content of the affected tissues.

It was clear from the outset, in view of the variations in the histology of the growth, that comparison of serial biopsy material might be Therefore the following conditions had to be satisfie

(1) All the patients should have a *proved* prostatic In 23 cases treated with œstrogens since 1942 the diagnos confirmed by biopsy in 21, the remaining 2 having indisp clinical, radiographic, and serological evidence.

(2) The patients should preferably show a good response to œstrogens since, if they did not, *no* well-d histological changes could be anticipated. The ideal would thus be one showing relief from pain, increase in and general well-being, but in which a degree of obstruction persisted requiring surgical relief.

(3) Any tissue for comparison should be removed fro same site as far as possible on each occasion, and care to avoid at the first biopsy undue trauma which might the later histological appearances. To satisfy this con I carried out every biopsy with the Gershom Thompson punch" resectoscope, removing tissue from "behin posterior quadrant of the urethra above the verumont I do not believe that there is any great risk of stimu metastatic spread by this technique. Diathermy hæm is reduced to a minimum to avoid subsequent necros bleeding is preferably controlled with a Foley's bag cat A control series of repeated resections of "adenoma prostates made in a similar manner showed neg traumatic reactions.

(4) Enough tissue should be removed on each oc to minimise any error due to vagaries of anatomical str and distribution of the growth.

RESULTS OF REPEATED BIOPSIES

n these lines I carried out repeated prostatic biopsies ine of the cases receiving œstrogens (table I). The rvals between these biopsies varied from 10 days to months, and in a few instances additional biopsies e undertaken over periods extending up to 3 years. inimum of 1·5–2·0 g. of tissue was removed on each asion for examination. In a further two cases, where r preliminary biopsy and initial response to treat- nt the patient later deteriorated, valuable serial terial was obtained at necropsy.

very patient received continuous œstrogen treatment, d any adjuvant therapy was on uniform lines. Œstro- n was administered as stilbœstrol or dienœstrol in ses of 2–15 mg. a day. As each successive biopsy s performed, serial sections were made and stained multaneously for accurate comparison.

The preliminary visual impression on examining the ctions suggested that in nearly all cases the neoplasm s regressing considerably during treatment. The llections of cells forming the tumour units were creasing not only in size but also in number. The neral trend appeared to be away from a glandular enocarcinomatous to a less cellular scirrhous form. his is well exemplified in fig. 1, which shows the histo- gical appearance on four occasions extending over arly 3 years. The photomicrographs are entirely presentative of many serial sections. Fig. 2 shows a milar picture of three biopsies extending over 17 months. In the remaining seven cases similar findings were btained.

A more detailed histological examination was under- ken in several instances, involving a computation of e tumour units in microscopic fields of standard size, nd a measurement of the nuclear diameters of the mour cells, which in the later specimens appeared to e smaller. These examinations were conducted by killed laboratory technicians for whose impartiality and bility I have the highest respect; and the results obtained lly confirmed the original visual impressions. The eduction in average size of the nuclei is shown in fig. 3, here in three cases the nuclear diameters are plotted gainst the number of nuclei.

During the last 18 months it has been possible to ubstantiate these findings by examining half the fresh biopsy material for tissue acid phosphatase. There are two ways of detecting it—biochemical estimation of the enzyme, and demonstration by the lead-nitrate and ammonium-sulphide staining method used by Gomori (1941). The methods seem to give comparable results in that a positive staining reaction visible to the naked eye appears to develop with reasonable uniformity when the concentration of the enzyme exceeds 1000 King-Armstrong units per 100 g. of tissue.

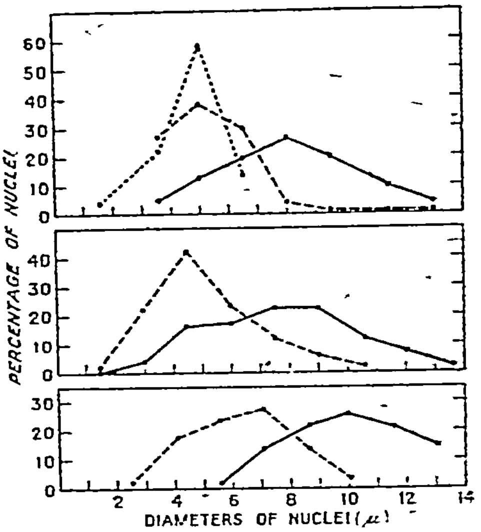


Fig. 3—Decrease in nuclear diameters of tumour cells of prostatic carcinoma during œstrogen treatment: solid lines, diameters at initial biopsy; broken lines, diameters at subsequent biopsies. A shift from right to left denotes reduction in diameters.

When I first tried the staining method I had two objects in view. Besides hoping to find a demonstrable reduction in the amount of enzyme in carcinomatous prostates as treatment progressed, I was anxious to discover whether the amount was greater in the posterior portion of the normal gland, a point which might possibly have a bearing on the frequency of malignant change in this situation. After a considerable number of normal adult prostates had been stained, my findings agreed with Gomori's (1941) view that the quantity and the distribution of the enzyme vary widely throughout the gland.

A few physiological adult prostates do not stain sufficiently to be visible with the naked eye, but in most, despite irregular distribution, there is evidence that a greater concentration of enzyme is common in the posterior part of the gland. This finding may, however, be influenced by potential "adenomatous" changes in the lateral lobes. Fig. 4 shows sections from two benign prostates differing in the distribution of the black-staining phosphatase, but in each case showing a quantity of enzyme in the posterior part behind the verumontanum. (Incidentally, staining of the complete female urethra to detect acid phosphatase has so far given no indication of a prostatic homologue.)

Carcinomatous prostates, on the other hand, generally show a consistently large amount of enzyme throughout their extent. A few quantitative estimations have been made on benign and malignant glands, and table II shows that whenever the whole benign gland was available a greater amount of enzyme was found in the posterior part. In the biopsy material, figures for carcinomatous tissue are slightly above the average for benign glands.

In four of the cases of prostatic carcinoma in which repeated prostatic biopsy was done the histological findings were supplemented by tissue acid-phosphatase estimation. In each case the concentration of the enzyme diminished during treatment, as illustrated in figs. 5 and 6. At the same time quantitative estimations showed decreases in units per 100 g. of tissue as follows: 8000 fell to 200, 3000 to 600, 8000 to 100, and 28,000 to 2000.

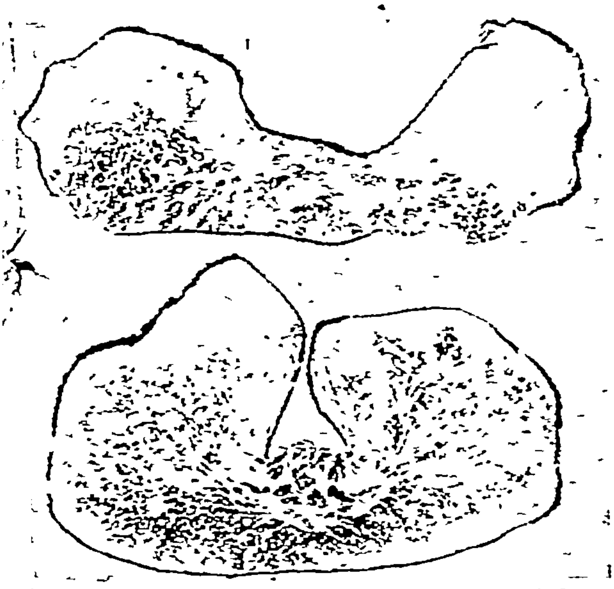


Fig. 4—Transverse sections of adult benign prostates, at level of verumontanum, stained to show acid phosphatase. Notice increased amount of enzyme in posterior part of gland.

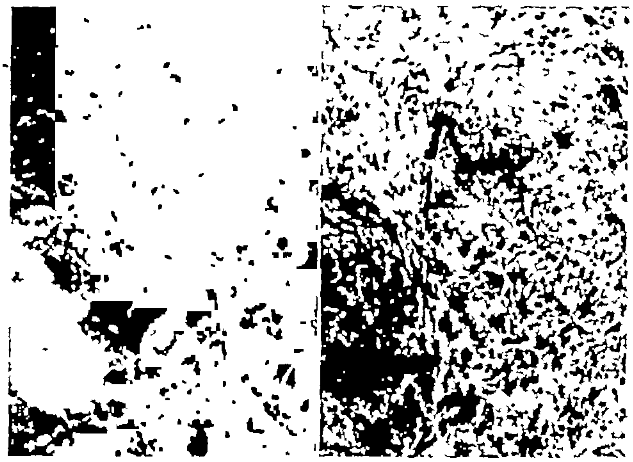

(a) (b)

Fig. 5—Serial biopsy specimens of prostatic carcinoma during œstrogen treatment, stained to show decrease in amount of acid phosphatase: (a) initial; (b) after 8 months.

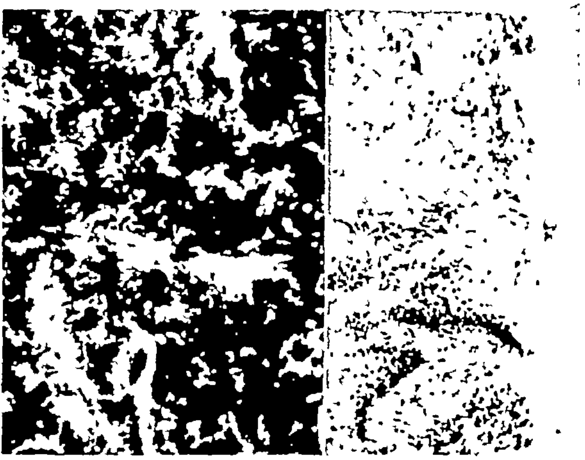

(a) (b)

Fig. 6—Serial biopsy specimens of prostatic carcinoma during œstrogen treatment, stained to show decrease in amount of acid (a) initial; (b) after a year.

These investigations indicate that, in some cases of prostatic carcinoma showing a good clinical response to œstrogens, there is a well-defined improvement in the condition of the primary growth, as shown by the histological changes and corresponding reduction of tissue acid phosphatase. This accords with the clinical finding that the prostate appears, on rectal examination, to lose some of its malignant characteristics. I hasten to add that some cases of prostatic carcinoma do not seem to respond to œstrogens, and that, apart from anaplastic forms as noted by Sullivan et al. (1942), I have been unable to correlate this failure with any particular histological picture.

Another point of importance is that there is no intimate connexion between the concentration of acid phosphatase in the affected prostate and the amount in the blood-serum. The serum value undoubtedly derives from the quantity elaborated by metastases as well as by the primary growth. Out of 50 cases of prostatic carcinoma treated since 1940, the serum value exceeded 3 units per c.cm. in 90% of 39 patients with radiological metastases.

BEHAVIOUR OF METASTASES

Though most metastases from prostatic carcinoma are not readily accessible for histobiochemical investigation, superficial lymph-nodes are not uncommonly involved. The opportunity, however, seldom presents for comparative study of these affected tissues, since this would presuppose identical malignant involvement of at least two glands at the outset.

So far as clinical evidence is allowable, one of my did comply with this condition. The patient had affected glands in the right axilla, similar in size and consistence, and showing equal clinical evidence of carcinomatous involvement. One gland was removed at the start of œstrogen treatment, and the other, which became noticeably smaller and softer, 24 days later. The microscopical findings are depicted in figs. 7 and 8, which show that the second gland exhibits less malignancy and contains a much smaller concentration of acid phosphatase. Normal lymph-glands show no acid-phosphatase staining reaction. This comparison is undoubtedly open to criticism, but, taken in conjunction with clinical evidence in other cases, gives reason for the belief that œstrogens may produce a beneficial, if temporary, effect on metastases.

No further opportunity for comparison has yet arisen, but in several other cases I have carried out phosphatase staining on solitary lymph-glands affected with prostatic cancer. In every case where the primary growth showed a positive staining reaction the gland did likewise.

I then tried to discover whether secondary involvement from other types of primary growth was accompanied by acid-phosphatase production, and to decide whether glandular biopsy with phosphatase assay would be of any value in diagnosis. Many lymph-glands affected by various pathological processes, including malignant disease, were examined, but acid phosphatase was rare except in secondary prostatic carcinoma. It was noteworthy that several tuberculous glands gave a

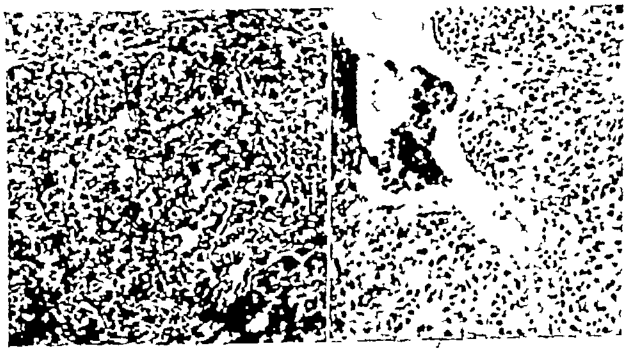

(a) (b)

Fig. 7—Sections from two similar axillary lymph-glands, affected by metastases from prostatic carcinoma, during œstrogen treatment. Gland (b) was removed 24 days after gland (a) and appears less malignant.

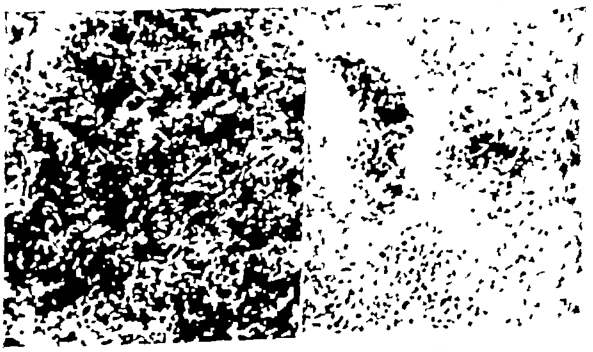

(a) (b)

Fig. 8—Same sections as in fig. 7, stained to show acid phosphatase. Gland (b) has le[illegible] than gland (a).

cate staining reaction, and I suspect this may be cted with subsequent calcification (fig. 9). Of nalignant glands examined, only two, apart from . affected by prostatic carcinoma, gave a positive ion. These were glands secondarily affected by noma originating in the stomach in one case, and in penis in the other.

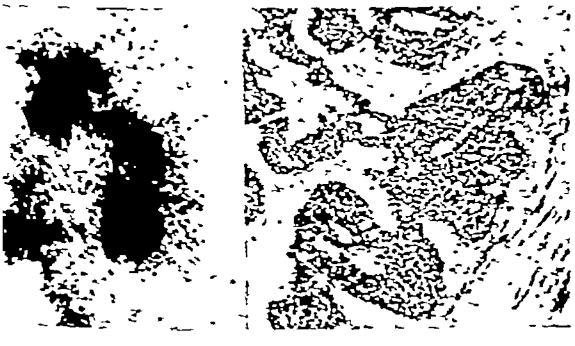
seems therefore that the presence of much acid -phatase in a secondarily affected gland strongly gests a primary growth in the prostate, but does not ve it.

SIDE-EFFECTS OF ŒSTROGEN THERAPY

Iost of the side-effects of œstrogens, particularly in ge doses and over long periods, are relatively harmless, l in several instances I have used dienœstrol 40–50 mg. ly without adverse results other than occasional miting.

Changes in the male breast appear in about two-thirds the cases. There may be tenderness of the nipple a, diffuse mammary swelling, and pigmentation. mentation is usually confined to the areola but may ely involve the surrounding skin (fig. 10). The breast anges do not seem to bear any constant relation to the ostatic response.

Shrinkage of the testes and *diminution of sexual feeling* ve taken place in about a quarter of my patients but ve been accepted with equanimity. Microscopy of ch testes shows no special changes beyond those sociated with senile atrophy. (I have incidentally und œstrogen therapy of considerable value in cases benign so-called prostatism associated with sexual errations.)


(a) (b)

g. 9—Sections of (a) tuberculous lymph-gland and (b) lymph-gland affected by metastasis from prostatic carcinoma, both stained to show acid phosphatase. Note amount of enzyme in (a).

Change in Complexion.—Though I have been unable detect any conspicuous loss of hair in my patients, it as been pointed out to me that many who have received rolonged treatment develop a choir-boy countenance.

Vertigo.—Apart from these minor side-effects and oradic mild skin rashes and œdema, the only thera-eutic complication which I thoroughly respect is vertigo. everal cases have been recorded in which patients died f a cerebral castastrophe, and I have had one such case. t is difficult to ascribe such an event to the giving of strogens, particularly in elderly patients, but I have the mpression that vertigo may be the precursor of this isaster. How far it is vascular in origin, and thus ossibly akin to the spasmodic vascular affections of emales, is a matter for speculation.

On the whole it may be said that, compared with many ther methods of treatment for prostatic cancer, œstro-en therapy seldom has disturbing sequelæ.

RESULTS OF TREATMENT

Of 50 cases of prostatic cancer which I have treated uring the last six years, 27 were treated on standard lines without œstrogen, and the remaining 23 received, in addition, continuous œstrogen therapy. I have excluded any cases of more recent date than December, 1945. From this small series, observed over a relatively short period, no conclusions are justifiable in respect of cure, but the survival-periods are interesting (fig. 11). Many of the surviving patients are in good health and appear likely to remain so for some time to come.

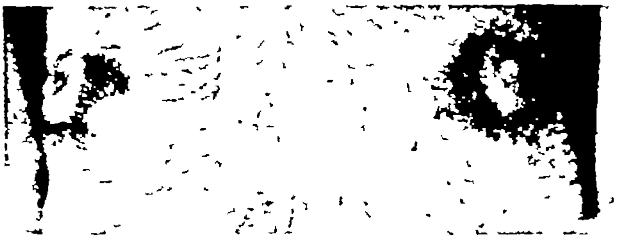


Fig. 10—Circumareolar pigmentation of male breast in patient receiving œstrogen treatment.

DISCUSSION

Roughly speaking, patients dying during œstrogen treatment can be divided into three classes:

(1) Patients who are moribund or in an advanced stage of renal failure when treatment is begun.

(2) Those who, though otherwise apparently eligible, show no reaction to œstrogens, and in whom the natural course of the disease proceeds unchecked. Probably many such patients have anaplastic tumours, possibly of a type that does not produce acid phosphatase.

(3) Patients who show a satisfactory initial response, as judged clinically, biochemically, and histologically, in whom a delayed and often sudden relapse takes place, as if all sensitivity to œstrogen was abruptly lost.

About half the deaths in the group receiving œstrogens fall into this last category of delayed reactivation of the growth. At necropsy in three of such cases almost complete regression of the primary prostatic growth was found, despite the coëxistence elsewhere of widespread metastases, many of which, from clinical evidence, were of recent origin. In all these cases prostatic biopsy at the start of treatment had shown a highly active primary growth. A similar finding after castration has been reported in the United States by Huggins (1942) and by Gilbert and Margolis (1943). One is reminded forcibly of the observations of Prym (1925) on the spontaneous inactivation of primary chorionepithelioma of the testis in conjunction with spreading metastases, and of the sporadic success of oöphorectomy performed for mammary cancer.

Two questions arise:

(1) Is this peculiar behaviour limited to neoplasms of the sexual apparatus? If so, may it not be possible that the action of œstrogen is physiological, primarily affecting the organ in which the growth arises?

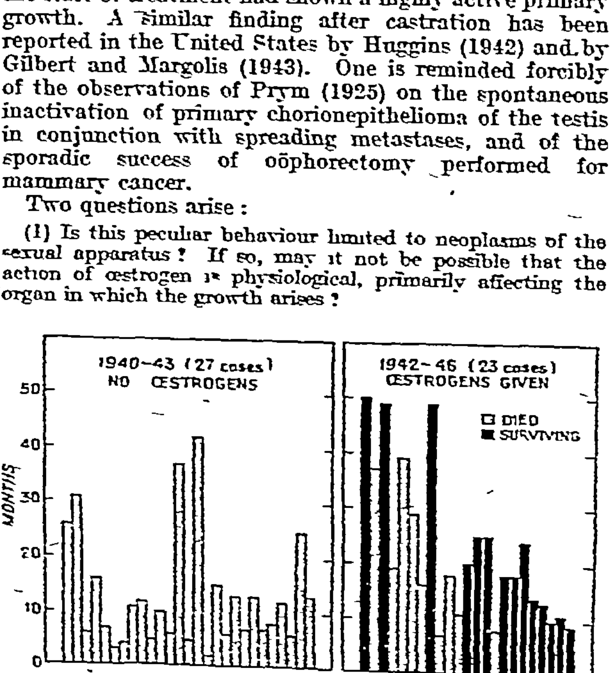


Fig. 11—Survival periods of patients with carcinoma of prostate, with and without œstrogen treatment.

vaccine bottles. So far no loss of potency has been demonstrable, even in antigen kept at room temperature for six months. Before general use each batch of antigen is tested on a known positive subject and a known negative subject.

Since human-type cercariæ from physopsis have been used exclusively, it is probable that the antigen is composed largely of *S. hæmatobium* products; but we feel, on epidemiological grounds, that these snails must be acting as intermediate hosts of *S. mansoni*, and we intend to investigate this question later. For the purposes of the skin-test the question is of academic interest only, since all workers agree that there is a common antigenic factor in the schistosomes.

PERFORMANCE OF TEST

We use the ordinary intradermal technique, with a tuberculin-type syringe and a fine-bore short bevelled needle. Influenced by Coca (1931), we inject as little of the antigen as possible, the aim being to use a dose of 0·01 c.cm., which usually raises a weal 3–5 mm. in diameter. The injection is made into the skin of the flexor surface of the forearm, choosing if possible an uninjured hair-free area. The importance of securing a true intradermal injection cannot be over-emphasised. If a small intradermal bleb is not obvious when the needle is withdrawn, the injection should be repeated at once in another place.

In view of suggestions that phenol per se may produce non-specific positive reactions in intradermal tests for trichiniasis (Spaeth 1942), we made control injections of carbol-saline in 200 of our cases. They included both positive and negative reactors to the antigen, but no positive reactions to the carbol-saline injection were seen.

We have been careful not to use ice-cold antigen direct from the refrigerator, since it is believed that false positives due to cold allergy may be encountered.

READING OF TEST

The reaction of the skin to the intradermal injection of the antigen is observed at 10, 15, and 20 min. In the *negative reactors* the original weal may disappear so completely that only the injection prick enables the site to be located. In other negative reactors the weal has not entirely disappeared at the end of this period but is certainly no larger than the original weal. Erythema is of no significance and is often seen in young children and women.

The commonest type of *positive reaction* is the formation of a disk-like button-weal which appears to be raised above the level of the normal skin. The elevation of this weal is often more apparent to touch than to sight. The increase in size of the weal varies enormously, and a weal 25 mm. across has been observed. In many positive reactors a ninefold increase in weal area is seen. Another type of weal commonly seen is characterised by an irregular outline and the pushing out of "pseudopodia" into the surrounding skin. In white-skinned positive reactors erythema round the weal can also be seen. In the flat type of weal it is often necessary to grasp the dorsum of the forearm and stretch the skin of the flexor aspect to blanch the erythema which may mask the outline of the weal.

LATE REACTIONS

We have no first-hand information about late reactions as described by Risquez and Boza (1941)—in fact, we have not had described to us any reaction at the site of injection. One patient described a transient œdema of the fingers of the arm into which the injection was made; he was a negative reactor, and the alleged œdema occurred six hours after the test. Another patient, a boy who was a positive reactor and in whom eggs of *S. hæmatobium* were subsequently found in the urine, developed, mainly on the trunk, ten days after injection, a scarlatiniform rash sufficiently sever cause his parents to call their doctor. The rash in twenty-four hours.

MATERIAL AND RESULTS

We performed skin-tests on three population grou European schoolboys aged 12–17 years, Eurafr schoolboys aged 7–17 years, and African young males enlisted in the S. Rhodesian native regiment, total of 592 subjects. Urine and stool specimens obtained from each subject at the time of testing, instructions having been issued on the best method collection. Further stool and urine specimens examined from all skin-test positive cases until sets of specimens had been obtained, or until eggs demonstrated. Some of the subjects defaulted in submission of specimens. The results are summarised tables I and II.

It is difficult to obtain reliable histories of previo treatment from Africans and the Eurafrican children These children particularly were so unreliable that no attempt has been made to classify treated and untreated The African treated group, however, had all receive treatment in the Army in 1943–45. The treated group of European boys had been treated by private practitioners in 1940–45. All the cases shown as positive were passing at least a proportion of viable eggs

There appears to be a significantly higher percentage of active infections in the treated than in the untreated European schoolboys. Whether this is due to insufficient

TABLE I—COMPARISON OF RESULTS OF SKIN-TESTS AND OF EXAMINATIONS OF SPECIMENS, AND ANALYSIS OF INFECTIONS

	197 European schoolboys	150 Eurafrican schoolboys	215 African men
Skin-test −ve Specimens −ve	93	57	47
Skin-test −ve Specimens +ve	0	0	0
Skin-test +ve 1st specimen +ve	23	41	87
Skin-test +ve 2nd specimen +ve	4	3	15
Skin-test +ve 3rd specimen +ve	6	5	17
Skin test +ve 4th specimen +ve	4	1	8
Skin-test infection-rate %	*52·5*	*62·0*	*58·5*
Infection-rate % of egg passers found on a single specimen	*11·7*	*27·3*	*35·5*
Infection-rate % of egg passers found on examination of 4 specimens	*18·7*	*33·3*	*61·3*
HELMINTH INFECTIONS			
S. hæmatobium	26	37 (*a*)	103
S. mansoni	12	19	29
Double infections—urine and stool	1	7	5
S. mansoni in urine	..	1	1
S. hæmatobium in stool	..	1 (*b*)	1
Hookworm	3	6	27
Strongyloides stercoralis	..	1	4
Trichuris trichiura	1	8	..
Tænia spp.	..	..	1
Ascaris lumbricoides	3	2	..
Enterobius vermicularis	4	2	..
Hymenolepis nana	..	..	1

(*a*) Includes two infections with eggs passed of *S. bovis* (*S. matthei*) type.

(*b*) An infection with eggs passed of *S. bovis* (*S. matthei*) type.

atment or to liability to reinfection on returning to eir usual environment, we do not know. One boy, ed 16 years, gave a history of no fewer than seven urses of antimony in the past eight years, and is still ssing viable eggs of *S. mansoni*.

DISCUSSION

Value of Negative Result of Test.—The tables show that e have not encountered a negative skin reaction in a atient who passes schistosome eggs. It must be admitted at many of the negative skin reactors have only been xamined once, and by our own showing single examiations of excreta for eggs are unsatisfactory. Nevereless we feel that in the many hundreds of controlled xaminations we would have at some time encountered uch a phenomenon if the test were not sufficiently ensitive. We therefore think it justifiable to assume reedom from infection in patients who have no skin eaction. In a country where schistosomiasis must be onsidered in all obscure and indefinite illnesses such an xclusion test as this will be of great value to clinicians and laboratory workers alike. In mass-treatment campaigns it can reliably be used to weed out the non-infected. We have already discussed the varying district incidence of schistosomiasis in Southern Rhodesia, and such a rapid "screening" will be of the utmost importance in saving drugs, material, staff, and time.

Value of Positive Result of Test.—In the earlier work carried out by one of us, the antigen could be used only on a small scale, and it was decided to attempt to assess the antigen by skin-testing hospital patients passing eggs. These patients, 90 in all, had positive skin reactions.

Table I shows that we have not succeeded in completely correlating positive skin-tests with the passage of eggs in the excreta. Nevertheless, the follow-up data indicate that the gap lessens as the number of repeat examinations is increased. We have not been able to do as many repeat examinations as are desirable; patients are lost sight of or may become reinfected. In any case we believe that there must always remain a hard core of infected persons whose infections will never be diagnosed by microscopical methods and in whom proof will be forthcoming only at operation or necropsy.

We would, however, cite our experience in examining a group of 50 children as opposed to adults. These children were Eurafricans in an orphanage. Of the 50 children examined, 25 were skin-test positive, and on the first examination of their excreta 16 infections were diagnosed. On the first re-examination of the remaining 9, 2 more infections were discovered; on the second re-examination of the remaining 7, 2 more were found; and on the third re-examination of the remaining 5, 1 more infection was diagnosed. A fourth re-examination did not reveal any further infections, but blood-counts revealed eosinophilia in all of the 4 remaining cases.

In our opinion the patient who presents a suggestive history and has a positive skin reaction, and in many cases an eosinophilia, should be given specific treatment. Positive reactors seen in mass investigations should also receive treatment. Some of these patients may not be infectious in that they are not passing eggs, but the debilitating and damaging effect of this disease would justify their treatment on public-health and economic grounds.

Value of Skin-test in Treated Cases.—Treated cases may be placed in one of several categories:

(1) Patients who can be shown to be passing viable eggs soon after a course of treatment, when sufficient time for reinfection has not elapsed. We have seen several such cases; they are all skin-test positive.

(2) Patients who cease to pass viable eggs but whose clinical condition shows only a transient improvement. This failure to maintain improvement may be due to two factors: tissue damage may have been so extensive that it cannot be ameliorated by drug therapy alone; or all the worms in the body have not been killed.

TABLE II—ANALYSIS OF RESULTS OF SKIN-TESTS

—	197 European schoolboys		150 Eurafrican schoolboys	245 African men	
	Tr.	Untr.	Total	Tr.	Untr.
No. in group	35	162	150	50	195
Skin-test −ve Specimen −ve	9	85	57	13	34
Skin-test +ve	26	77	93	37	161
1st examination +	8	15	41	11	76
1st examination −	18	62	52	26	85
2nd examination +	3	1	3	7	8
2nd examination −	15	60	46	11	71
3rd examination +	2	4	5	2	15
3rd examination −	12	52	38	7	55
4th examination +	1	3	1	2	6
4th examination −	10	47	34	4	40
Skin-test infection-rate %	*74·3*	*47·5*	*62·0*	*74·0*	*82·5*
Infection-rate % of egg-passers found on examination of four sets of specimens	*40·0*	*14·2*	*33·3*	*44·0*	*53·5*

Fairley et al. (1930) present evidence that, in experimental infections, male worms are more resistant than females to treatment with tartar emetic. Fairley (1924) records positive complement-fixation tests in patients who have been treated with tartar emetic and are passing no eggs, and he later (1926) postulated the survival of the more resistant male worms.

Many of our patients who have received by ordinary standards an adequate course of treatment fall into the second group; their skin-tests are positive. On the other hand, patients are met whose skin-tests are negative but whose clinical condition remains unsatisfactory.

(3) Patients who cease to pass eggs and whose clinical improvement is maintained and whose skin reaction becomes negative. In our series of 100 cases treated with intensive antimony (Alves and Blair 1946) many such cures were obtained. It was possible to demonstrate in some of these a negative skin reaction two months after the cessation of treatment, whereas others showed negative reactions after three months. This reversion to negative after two months probably represents too rigorous a standard for clinical application, but we have no reason to believe that in a cured case the skin reaction will remain positive after a period much in excess of this.

We therefore suggest that further treatment is needed in cases showing positive skin reactions six months after treatment. We have been much impressed with the apparent failure of the ordinary course of antimony and sodium tartrate to cure even those subjects who coöperate completely in adhering to the prescribed routine.

The several groups of treated cases may therefore be summarised as follows:

(1) *Complete Failures.*—Passage of viable eggs, no improvement in clinical condition, positive skin-test. Further treatment indicated.

2. "*Public-health*" *Cures.*—No eggs passed, possible clinical improvement, positive skin-test. In mass campaigns no further treatment.

3. *Partial Failures.*—(*a*) No eggs passed, possible clinical improvement, positive skin-test; further treatment indicated for the individual patient. (*b*) No eggs passed, little or no clinical improvement, negative skin-test; further drug treatment useless.

4. *Perfect Cure.*—(*a*) No eggs passed, clinical improvement manifest, negative skin-test. (*b*) Passage of dead eggs,

possibly for considerable periods after cessation of treatment; clinical improvement and negative skin-test.

SUMMARY

Routine microscopy in the diagnosis of schistosomiasis is inaccurate and expensive.

The preparation and use of a cercarial antigen for intradermal testing is described.

A higher proportion of cases of schistosomiasis is revealed by this antigen than can be detected even by repeated microscopical examinations.

The efficiency of treatment of this disease can be measured more accurately with the skin-test.

Since no negative skin reactors have been found to be passing eggs, the test can be used as a rapid and accurate "screen" in mass-treatment campaigns.

Its use in indicating the need for further treatment is also outlined.

Our thanks are due to Dr. A. P. Martin, O.B.E., medical director, Southern Rhodesia, for permission to make this communication.

REFERENCES

Alves, W., Blair, D. M. (1946) *Lancet*, i, 9.
Begg, R. C. (1944) *S. Afr. med. J.* 18, 239.
Coca, A. F. (1931) Asthma and Hay Fever, Baltimore, p. 316.
Culbertson, J. T., Rose, H. M. (1942) *Amer. J. Hyg.* 36, 311.
Fairley, N. H. (1924) *Indian med. Gaz.* 59, 377.
— (1926) *Trans. R. Soc. trop. Med. Hyg.* 20, 236.
— Mackie, F. P., Jasudasan, F. (1930) *Indian J. med. Res.* memoir no. 17, p. 67.
— Williams, F. E. (1927) *Med. J. Aust.* ii, 811.
Girges, R. (1934) Schistosomiasis, London, p. 313.
Kan, H. C. (1936) *Chin. med. J.* suppl. p. 387.
Mayer, M., Pifano, C. F. (1942) *Rev. Sanid. Asist. social*, 7, 397.
Orpen, L. J. J. (1916) *Rep. publ. Hlth S. Rhodesia.*
Ottolina, C., Atencio, M. H. (1943) *Rev. policlin. Caracas*, 12, 348.
Risquez, J. R., Boza, F. V. (1941) *Gac. med. Caracas*, 48, 289.
Scott, J. A. (1942) *Amer. J. Hyg.* 35, 337.
Senra, J. de M. (1942) *Brasil-med.* 56, 107.
Spaeth, H. (1942) *Dtsch. med. Wschr.* 68, 935.
Taliaferro, W. H., Taliaferro, L. G. (1931) *P.R. Rev. (J.) publ. Hlth*, 7, 23.

PENICILLIN IN INFANCY AND CHILDHOOD *

JEAN L. BUCHANAN
M.B. Glasg.

From the Royal Hospital for Sick Children, Glasgow

PENICILLIN can be given to infants and young children (1) by continuous intramedullary, intramuscular, or intravenous drip; (2) by intermittent intramuscular injection; or (3) by mouth.

Injection into the bone-marrow near the lesion has been successfully used in acute osteomyelitis (Aird 1945). Alternatively, the sternal marrow may be used. But intramedullary injection or infusion carries a risk of infecting the marrow with penicillin-insensitive organisms and ought not to be undertaken without skilled supervision.

Intravenous injection presents special difficulties in young patients because their veins are small and readily thrombosed; and since the veins may later be required for blood-transfusion it is inadvisable to cut down on more than one. Also children need frequent nursing attention which tends to displace the needles, with added risk of infection.

Despite nursing difficulties, continuous intramuscular injection by drip is the method preferred in the surgical wards of the Royal Hospital for Sick Children, Glasgow, for patients over the age of 2 years. Since children's small muscles have a limited power of absorption and less resistance to infection than adult tissues, particular care must be taken not to distend them and to avoid infection at the site of the needle-punctures.

The standard dose for the intramuscular drip in this hospital is 100,000 units per 24 hours, and the apparatus used is the 'Eudrip' no. 3 (McAdam et al. 1944). With this dose the blood-penicillin level is usually adequate, but occasionally, when the infecting organism is penicillin-resistant, dosage is doubled, and in ex cases it may even be increased to 500,000 units hours. Table I shows the maximum dilutions of producing complete inhibition in eleven cases from various age-groups and receiving penicillin 100 units per 24 hours by continuous intramuscular drip. The slide-cell method of estimating the level of serum inhibition was used (Bigger et al. 1944), and the test organism was the Oxford staphylococcus. Complete inhibition in a serum dilution of 1 in 32 was accepted as equivalent to 1 unit of penicillin per c.cm. of the patient's serum.

TABLE I—MAXIMAL DILUTIONS OF SERUM PRODUCING CO INHIBITION IN CASES RECEIVING PENICILLIN 100,000 U PER 24 HR. BY CONTINUOUS INTRAMUSCULAR DRIP

Case	Age (yr.)	Dilution of serum*
1	1½	Undiluted
2	3	1 in 4
3	5½	1 in 8
4	6	Undiluted
5	7	1 in 16
6	7½	1 in 32
7	8	1 in 4
8	8	1 in 16
9	9	1 in 4
10	9½	Undiluted
11	10	1 in 2

* Serum diluted with broth.

In the medical wards of this hospital intermittent intramuscular injection and oral administration are employed for infants and young children. Bodian (1945) advocated injection into muscle of 1000 units per lb of expected body-weight per 24 hours in divided doses at 3-hourly or 4-hourly intervals, and obtained complete bacteriostasis in undiluted serum up to 4 hours after injection in only 60% of children. It is generally accepted that the basic principle of penicillin therapy is to maintain a minimum therapeutic level constantly in the blood, and Garrod (1944) and Kolmer (1945) consider inhibition in undiluted serum adequate. Our experience showed that penicillin 1000 units per lb. of body-weight per 24 hours was often insufficient to attain this, even in young infants in whom, presumably owing to inefficient excretion by kidneys not yet fully functioning, the blood-penicillin level tends to be higher than in other age-groups. Accordingly the dose was doubled, and further blood tests were performed. Fig. 1 shows that 2000 units per lb. per 24 hours maintains inhibition in undiluted serum. Since, however, occasions might arise where higher levels would be desirable—e.g., in infections with less sensitive organisms—experiments were undertaken with 4000 units per lb. of expected body-weight per

TABLE II—BLOOD-PENICILLIN LEVELS WITH INTRAMUSCULAR PENICILLIN 5000 UNITS (APPROX.) PER LB. OF EXPECTED BODY-WEIGHT PER 24 HR. (6-HOURLY INJECTIONS OF 25,000 UNITS FOR CHILDREN UNDER 2 YEARS OF AGE, AND OF 50,000 UNITS FOR THOSE AGED 2–5 YEARS)

Case	Blood-penicillin level	
	½ hr. after injection	5½ hr. after injection
1	Inhibition— complete at 1 in 64 partial at 1 in 128	Inhibition— complete in undiluted serum
2	complete at 1 in 64 partial at 1 in 128	partial in undiluted serum
3	complete at 1 in 128 partial at 1 in 256	partial in undiluted serum
4	complete at 1 in 32	complete in undiluted serum
5	" " 1 in 64	" " " "
6	" " 1 in 64	" at 1 in 2

---

* Work done during the tenure of a McCunn scholarship.

ours. Fig. 2 shows results resembling those in fig. 1, with the blood-penicillin level better maintained. ordingly, we regard 4000 units per lb. of expected ly-weight per 24 hours given intramuscularly at ourly intervals as the optimum dose. This view forms to the latest recommendation on adult dosage udson et al. 1946, Agerholm and Trueta 1946) and persedes the 1000 units per lb. originally suggested the standard adult dose by Florey (1944).

Since penicillin is relatively non-toxic, the optimum se may be exceeded for ease in dispensing. For ample, in this hospital the practice is to maintain in e ward refrigerators solutions of penicillin in strengths 5000, 10,000, and 15,000 units per c.cm., and of 25,000 d 50,000 per 2 c.cm., prepared in phials or ampoules the laboratories with pyrogen-free sterile saline. For ildren under the age of 3 months 5000 units is given ght times a day by injection or by mouth, and for ildren aged 3–6 months 10,000 units eight times a day injection. These doses correspond approximately to 4000 units per lb. of normal body-weight per 24 hours. Though an adequate serum-penicillin level can be reached by 3-hourly intramuscular injections, the repeated punctures, with risk of infection, are a disadvantage, especially in infants and young children, and it seemed advisable to reduce the frequency of injection if this could be done without therapeutic loss. Accordingly 6-hourly injections of 25,000 units were given to children under the age of 2 years, and 50,000 units to those aged 2–5 years. This dosage approximates to 5000 units per lb. of expected body-weight per 24 hours and maintains a constant therapeutic blood-penicillin level. Turner (1944) also found 6-hourly injections satisfactory in infants and children, and Fleming et al. (1944) recommend 6-hourly injections of large doses. Table II shows the blood-penicillin levels obtained by this method.

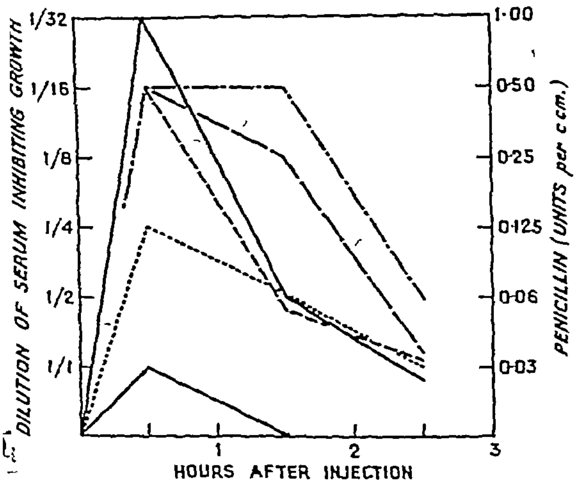


Fig. 1—Blood-penicillin levels of children having 2000 units per lb. of expected body-weight per 24 hours by intramuscular injection at 3-hourly intervals.

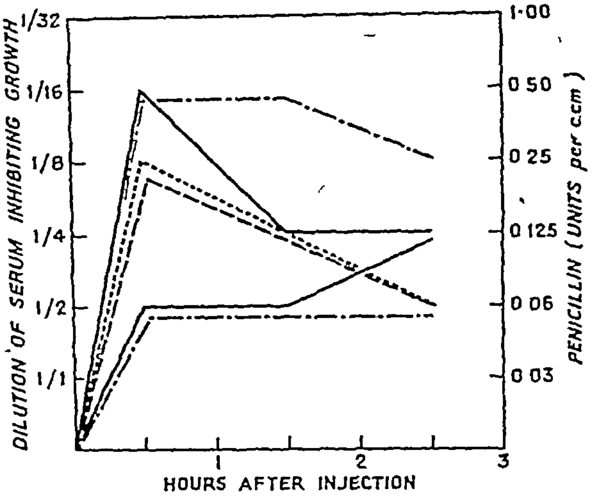


Fig. 2—Blood-penicillin levels of children having 4000 units per lb. of expected body-weight per 24 hours by intramuscular injection at 3-hourly intervals.

ORAL PENICILLIN

Administration by mouth, if proved as effective as intramuscular injection, would make penicillin therapy simpler for the doctor and the nurse and less trying for the patient. In adults it has been demonstrated that oral administration is practicable, at least in infections with the most sensitive organisms, but only by expenditure of four or five times the amount of penicillin needed systemically.

Since Rammelkamp and Helm (1943) have noted that saliva, succus entericus, and bile do not exert a destructive effect, the main inactivating factor is the acid of the stomach (Abraham et al. 1941, Rammelkamp and Keefer 1943). Levinson and MacFate (1937) and Miller (1941, 1942) investigated the gastric juice in infancy and found low acidity, both total and free, except in the first few days after birth. Acidity, which then approximated to the adult level, did not again reach that level until the age of 3 years. The degree of free acidity appears to be correlated with the birth-weight, and a large proportion of the premature infants investigated had achlorhydria. It has been found in this hospital (F. M. Earle, personal communication) that, as a general rule, infections materially reduce the amount of free hydrochloric acid in the gastric juice. In view of these facts, it was considered feasible to explore the possibilities of oral administration to babies under the age of 6 months—the age-group in which a method other than intramuscular injection is most desirable.

A series of 25 babies was investigated, some in the sick nursery of the Royal Maternity Hospital, and others in

TABLE III—LEVELS OF SERUM INHIBITION AFTER ORAL PENICILLIN

(*a*) ½ hr. after penicillin; (*b*) 2½ hr. after penicillin; (*c*) 3½–4 hr. after penicillin

Case	Serum inhibition
1.	(*a*) Partial at 1 in 2; complete in undiluted serum (*b*) Complete in undiluted serum (*c*) Partial in undiluted serum
2	(*a*) Partial at 1 in 16, complete at 1 in 8 (*b*) (*c*) Complete at 1 in 2
3.	(*a*) Complete at 1 in 16 (*b*) Complete at 1 in 2 (*c*) Complete in undiluted serum
4.	(*a*) No inhibition in undiluted serum (*b*) Inhibition in undiluted serum (*c*) Complete at 1 in 2
5.	(*a*) (*b*) Complete at 1 in 4
6.	(*a*) (*b*) Complete at 1 in 4
7.	(*a*) (*b*) Complete at 1 in 8
8.	(*a*) Complete at 1 in 2; partial at 1 in 4 (*b*) Complete at 1 in 4
9.	(*a*) Complete at 1 in 4; partial at 1 in 8 (*b*) Complete at 1 in 8
10.	(*a*) (*b*) Complete at 1 in 8
11.	(*a*) Complete in undiluted serum; partial at 1 in 2 (*b*) Complete at 1 in 2
12.	(*a*) Complete at 1 in 2 (*b*) Complete in undiluted serum
13.	(i) (*a*) Complete at 1 in 4 (*b*) Complete at 1 in 2 (ii) (*a*) Complete in undiluted serum; partial at 1 in 2 (*b*) Complete in undiluted serum
14.	(*a*) Complete at 1 in 16 (*b*) Complete at 1 in 8
15	(*a*) Complete at 1 in 16 (*b*) Complete at 1 in 8
16.	(*a*) Complete at 1 in 2 and at 1 in 8 (*b*) Complete at 1 in 2
17.	(*a*) (*b*) Complete at 1 in 4
18.	(*a*) Complete in undiluted serum; partial at 1 in 2 (*b*) Complete at 1 in 2
19.	(*a*) Complete at 1 in 2 (*b*) Complete in undiluted serum
20.	(*a*) Complete at 1 in 4 (*c*) Complete at 1 in 2
21.	(*a*) (*c*) Complete at 1 in 8
22.	(*a*) Complete in undiluted serum; partial at 1 in 2 (*c*) Complete in undiluted serum
23.	(*a*) Complete at 1 in 8
24.	(*a*) (*c*) Complete at 1 in 8
25.	(*a*) Complete at 1 in 2 (*c*) Complete in undiluted serum

the Royal Hospital for Sick Children, most of the infants being in the first month of life. The penicillin was given in the first $^1/_2$ oz. of the 3-hourly or 4-hourly feed, in the dosage of 4000 units per lb. of expected body-weight per 24 hours. The first 4 babies were healthy, and the penicillin by mouth was experimental. In the other 21 babies penicillin was given therapeutically for various neonatal infections. The immediate clinical results of oral administration were on the whole striking, though there were a few relapses which responded to prolonged treatment. Two cases of clinical jaundice with liver enlargement did not respond to oral penicillin but improved on changing to parenteral penicillin. The blood-penicillin levels after oral administration in this group of infants are recorded in table III.

These results show serum-penicillin levels at least as good as those obtained by intramuscular injection—in fact in many cases inhibition is maintained longer. This, as has been mentioned, is due mainly to the fact that the kidney of the very young infant, especially the premature infant, is relatively inefficient (McCance and Young 1941). Probably the adult type of function is not acquired until the end of the first year of life.

It may therefore be said that administration of penicillin in feeds to infants, especially to premature babies, gave results both clinically and serologically comparable with those following intramuscular administration.

The number of babies and premature infants is too small to warrant detailed analysis, but there is no doubt of the striking clinical improvement in the children to whom penicillin was given by mouth. Most of the infections were respiratory and, though the causal organisms, owing to the difficulty of obtaining material, were not identified, the exhibition of penicillin was followed immediately by a fall in temperature, an increase in weight, and improvement in general nutrition. Ross Couper (1945) has already published equally favourable clinical findings.

Oral administration to older children, in whom free hydrochloric acid is present in the gastric contents, is a problem similar to that of its administration to adults. Many vehicles have been used for this purpose (*Lancet* 1945). Experience in this hospital has been limited to penicillin-in-egg mixture (Little and Lumb 1945) and to penicillin combined with aluminium hydroxide (Welch et al. 1945). The former proved nauseating; and, though it was possible to achieve adequate serum-penicillin levels with repeated loading doses of the aluminium-hydroxide mixture, the results on the whole were inconsistent.

SUMMARY

Using intramuscular injections of penicillin, 2000 units per lb. of expected body-weight per 24 hours is required to maintain constant bacteriostasis, with the standard Oxford staphylococcus as the test organism.

It is recommended, however, since infecting organisms vary in their penicillin sensitivity, and to leave a margin of safety, that for general therapy this dose should be doubled.

In infants under 6 months, owing to the low hydrochloric acid content of the gastric juice, penicillin can be administered satisfactorily by mouth in feeds.

Penicillin 4000 units per lb. of expected body-weight per 24 hours given orally to infants has yielded results clinically and serologically comparable to those obtained by injection and should be the method of choice.

I wish to thank Dr. G. L. Montgomery and Dr. K. J. Guthrie for their help both in the work involved and in the preparation of this paper; Dr. Stanley Graham for his valued advice and criticism; and Dr. F. M. Earle for permission to quote some results of her work.

References at foot of next column

OBSERVATIONS ON FIBRINOLYSIS

PLASMINOGEN, PLASMIN, AND ANTIPLAS CONTENT OF HUMAN BLOOD

R. G. MACFARLANE
M.D. Lond.
RADCLIFFE LECTURER IN HÆMATOLOGY, OXFORD UNIVE
CLINICAL PATHOLOGIST, RADCLIFFE INFIRMAR

J. PILLING
B.Sc. Manc.
RESEARCH ASSISTANT, DEPARTMENT OF PATHOLOG
RADCLIFFE INFIRMARY

THE clots formed by normal whole blood, or recalcified citrated or oxalated plasma, will re intact in their own serum for days, or even week bacterial growth is prevented. In certain circumsta however, this stability is lost, so that soon after coag tion they break up and disappear. This phenomen called by Dastre (1893) "fibrinolysis," was until re mainly of academic interest; now there are indicatio that it may prove to be a manifestation of a fundamental physiological process.

Nolf (1905, 1908), one of the principal workers on th subject, produced fibrinolysis experimentally in by complex procedures involving hepatectomy a peptone shock. Later (1921, 1922) he studied th fibrinolytic activity that can be produced in plasma b treatment with chloroform "in vitro." He conclud that the fibrin was digested by the proteolytic actio of thrombin, an agent considered by him to consist o two factors ("thrombozyme and thrombogen") who proportions determined proteolysis. Part of this co clusion is supported by the work of Tagnon et al. (194 who confirmed the early observation of Delezene an Pozerski (1903) that chloroform-treated plasma becom capable of digesting casein and gelatin, and related th proteolytic activity to the destruction of fibrin an fibrinogen by such plasma. They considered that a enzyme resembling trypsin is liberated in some way b chloroform, but *that it is not thrombin.*

Recently a new aspect of the process has been reveal by Kaplan (1944), Christensen (1944, 1945), and Christensen and MacLeod (1945). They have shown that the familiar fibrinolytic power ascribed to cultur filtrates of certain strains of β-hæmolytic streptoco is actually due, not to direct action of the filtrate on th fibrin, but to its activation of an enzyme precur present in normal plasma and likely to contaminate th usual preparations of fibrin. Christensen and MacLe (1945) have found that the enzyme so activated, thou proteolytic, is not trypsin. It is associated with th

---

DR. JEAN BUCHANAN: REFERENCES

Abraham, E. P., Florey, H. W., Chain, E., Fletcher, C. M., Garde A. D., Heatley, N. G., Jennings, M. A. (1941) *Lancet*, ii, 177.
Agerholm, M., Trueta, J. (1946) *Ibid*, i, 877.
Aird, I. (1945) *Proc. R. Soc. Med.* 38, 569.
Bigger, J. W., Thomas, G. E., Caldwell, W. G. D. (1944) J. P *Bact.* 56, 260.
Bodian, M. (1946) *Proc. R. Soc. Med.* 38, 572.
Fleming, A., Young, M. Y., Suchet, J., Rowe, A. J. E. (1944) *Lan* ii, 621.
Florey, M. E. (1944) *Brit. med. Bull.* 2, 9.
Garrod, L. P. (1944) *Brit. med. J.* i, 528.
Hudson, R. V., Meanock, R. I., McIntosh, J., Selbie, F. R. (194 *Lancet*, i, 409.
Kolmer, J. A. (1945) Penicillin Therapy. New York and Lond
Lancet (1945) ii, 746.
Levinson, S. A., MacFate, R. P. (1937) Clinical Laborator Diagnosis, Philadelphia, p. 616.
Little, C. J. H., Lumb, G. (1945) *Lancet*, i, 203.
McAdam, I. W. J., Duguid, J. P., Challinor, S. N. (1944) *Ibid*, ii, 336
McCance, R. A., Young, W. F. (1941) *J. Physiol.* 99, 265.
Miller, R. A. (1941) *Arch. Dis. Childh.* 16, 22.
— (1942) *Ibid*, 17, 198.
Rammelkamp, C. H., Helm, J. D. jun. (1943) *Proc. Soc. exp. Biol. N.Y.* 54, 324.
— Keefer, C. S. (1943) *J. clin. Invest.* 22, 425.
Ross Couper, E. C. (1945) *Arch. Dis. Childh.* 20, 117.
Turner, E. K. (1944) *Med. J. Aust.* ii, 205.
Welch, H., Price, C. W., Chandler, V. L. (1945) *J. Amer. med. As* 128, 846.

ulin of the plasma, and is apparently identical with enzyme activated by chloroform. They suggest name "plasmin" for the enzyme, "plasminogen" its inactive precursor, and "streptokinase" for the terial activator. A fourth component must be added these. It has long been recognised that normal sma or serum contains an antiproteolytic factor lezene and Pozerski 1903) associated with the albumin ction (Opie and Barker 1907). This factor is probably cerned with the absence of fibrinolysis in normal ood, and may be called, for convenience, "antiasmin."

The recognition of these components of a proteolytic stem existing in normal blood greatly facilitates an proach to the problem of spontaneous fibrinolysis in an. It is most probable that the disappearance of brin in blood taken after sudden death (Yudin 1936), auma (Macfarlane 1937), or burns and hæmorrhage agnon et al. 1946) is due to the activation of this stem. The possible significance of such a process ecomes the more apparent when it is realised that the lasminogen of normal blood is of a potential activity ufficient to destroy the total fibrinogen of the body in a w minutes, and the more interesting since it is pparently associated with the problematical condition f "shock." Further investigation is desirable, and ight be divided into studies of three aspects of the roblem—first, the interaction of the plasma factors ulminating in fibrinolysis; secondly, the nature of the hysiological process that activates the proteolytic ystem; and thirdly, the effect on the living subject f the proteolytic enzyme when present in the bloodtream. The present paper describes some observations n the first of these. Later publications will be concerned ith the other aspects.

EXPERIMENTAL TECHNIQUE

A first necessity in the study of the inter-relations of lasminogen, antiplasmin, and plasmin is a method for the quantitative assay of plasmin. Since this is a proteolytic enzyme, it would have been desirable to measure its activity by determining the rate of digestion of a pure substrate such as gelatin or casein. Fibrinolysis, indicated by the disappearance of a fine clot formed by the action of thrombin on dilute fibrinogen, has proved, however, to be a far more sensitive index of plasmin activity than protein degradation. In human material, activity, though present, may be so low that fibrinolysis is the only demonstrable effect, and in consequence it has been adopted as the indicator in these experiments. It has the disadvantage that only the presence or absence of the clot can be determined; the extent of partial lysis cannot easily be measured with any reliability. Plasmin activity could therefore be assessed either in terms of the time required for the lysis of a certain amount of fibrin, which is inconvenient, or by determining the greatest dilution of the sample that will lyse an amount of fibrin in a given time. The latter has been adopted here, though it was realised that other reactants besides plasmin would be involved in the dilution, which might lead to complications. As will be seen, complications did arise but were themselves of interest.

The basic technique was as follows. Blood obtained by venepuncture was mixed with 1/9th of its volume of 3·8% sodium citrate solution and spun in the centrifuge at 2500 r.p.m. for 10 minutes; the plasma was then separated. The plasma was diluted with twice its volume of buffer-merthiolate-saline* containing any agent required. After any other necessary treatment 9 serial twofold dilutions of the mixture were made using a 0·1% solution of fibrinogen prepared by the method of Milstone (1941) in the buffer mixture. Three volumes of each dilution were placed in a Wassermann tube and one volume of thrombin solution† added to each tube of the series. Clotting took place in about 30 seconds, and was firm enough to allow the tubes to be inverted without spilling. The final dilutions of the plasma were 1 in 4, 1 in 8, 1 in 16, and so on, to 1 in 2048 in the 10th tube of the series. Assuming that the fibrinogen content of the original plasma was about 300 mg. per 100 c.cm., the fibrinogen concentration in each tube was approximately constant at 75 mg. per 100 c.cm.

After 24 hours' incubation at 37° C. the contents of the tubes were examined for lysis of the fibrin. The end-point was usually sharp, one tube containing an intact clot, the next in the series nothing but clear fluid and a slight amorphous precipitate.

"Chloroform plasma" was prepared by the method of Tagnon et al. (1942) and then treated as described. "Active plasma"—that is, plasma showing spontaneous fibrinolytic activity—was obtained from suitable subjects.‡ The "globulin" fraction was separated by dialysing plasma against moving distilled water in the cold for 24 hours, bringing its pH to 5·5 (estimated by the glass electrode) with $N/10$ acetic acid, and separating the precipitate. The precipitate was then washed with distilled water saturated with CO_2, and finally dissolved in a volume of buffer mixture equal to the original volume of plasma. The "albumin" fraction remained in the supernatant fluid after separation of the globulin precipitate at pH 5·5. The last traces of the latter were removed by spinning at 4000 r.p.m. for 15 minutes, and the pH was then brought to 7·2 with $N/10$ caustic soda. These fractions were treated in the way described for plasma, except that fibrinogen was added to the albumin solution to a final concentration of 300 mg. per 100 c.cm. The globulin contained the fibrinogen of the original plasma.

Dry streptokinase was prepared by the method of Christensen (1945) by Dr. E. S. Duthie and used in a final concentration of 0·1%. It had no action alone on the fibrin prepared in these experiments, but, as a precaution, after 30 minutes' incubation with the plasma or plasma fraction to be studied, it was inactivated by the addition of a predetermined amount of antiserum also prepared by Dr. Duthie.

EXPERIMENTAL RESULTS

The results of the experiments (*A–R*) are shown in the table, each horizontal row indicating the presence (+) or absence (0) of fibrinolysis at a particular dilution. They are representative of a number of repetitions.

A—Dilutions of normal plasma show no lysis in 24 hours.

B—Incubation of normal plasma with streptokinase before dilution results in lysis in tubes 4 to 9, this last dilution (1 in 1024) representing the titre of the activated plasmin. The surprising absence of lysis in the first three tubes is important. It is probably due to the presence of an inhibitor which loses its effect on dilution.

C—"Chloroform plasma" destroys fibrin to a dilution of 1 in 256 (tube 7), but without any initial inhibition.

D—Streptokinase added to chloroform plasma increases the plasmin titre to 1 in 2048 (tube 10), suggesting that chloroform alone does not activate all the enzyme precursor.

E—Spontaneously active plasma lyses fibrin to tube 6, with inhibition in the first tube.

F—Streptokinase added to "active plasma" extends lysis to tube 8, without inhibition, suggesting that there is a reduction of inhibitor but incomplete activation of the enzyme precursor in "active plasma."

---

* The buffer is made as follows: 1·72 g. glyoxaline and 90 c.cm. of $N/10$ HCl are made up to 100 c.cm. with water; 5 c.cm. of this is added to 245 c.cm. of 0·9% saline containing 0·001% merthiolate.

† A 1/250 dilution in buffer mixture of "clotting globulin" prepared by Lederle Laboratories Inc., New York. This thrombin preparation has no fibrinolytic activity. Preparations of human thrombin have been used but are sometimes spontaneously fibrinolytic.

‡ The methods by which spontaneous fibrinolytic activity can be produced in human subjects will be described in a later publication.

G—Normal globulin is spontaneously active to tube 5, without inhibition in the first tubes.

H—The activity of normal globulin is increased to tube 8 by streptokinase. It contains, therefore, both active enzyme and its precursor.

I and J—Albumin has no activity, even when treated with streptokinase.

K—The spontaneous activity of globulin is lost when it is re-combined with albumin in the normal proportions.

L—The albumin from chloroform plasma has no inhibitory power on normal globulin.

M and N—The globulin fraction from chloroform plasma is more active than normal globulin, but is completely inhibited by normal albumin.

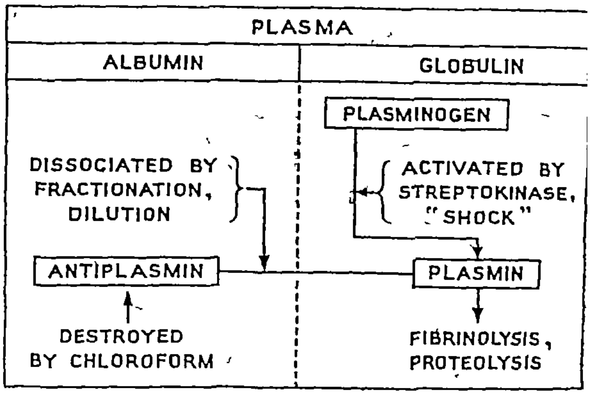
O—The albumin fraction from plasma treated with streptokinase inhibits normal globulin in the first three tubes, but there is lysis in tubes 4 and 5. This may suggest that there is some reduction of the potency of the inhibitor after treatment with streptokinase, *but it is possible that some of the* kinase was carried over with the albumin fraction to activate the globulin.

P and Q—The globulin fraction of spontaneously active plasma is more lytic than normal globulin, but, in this experiment, is completely inhibited by normal albumin. In other experiments, however, with more active globulin, normal albumin may not completely inhibit lysis.

R—The albumin from "active plasma" does not completely inhibit normal globulin.

DISCUSSION AND CONCLUSIONS

From these experiments it appears that normal plasma contains at least three factors concerned in fibrinolysis. In the "globulin fraction" is a certain amount of active plasmin, and a further quantity of its precursor, plasminogen. It might be argued that the activity observed in this fraction was induced by the technique of separation, but, since it is lost on re-combination with albumin, it is reasonable to suppose that this proportion of plasmin exists in normal blood in combination with the antiplasmin of the albumin fraction. If this is so, the combination is a loose one, being broken by fractionation. Moreover, if the plasmin content of plasma is for any reason increased, fibrinolytic activity firs becomes apparent in the higher dilutions of the plasma suggesting that dilution favours dissociation of th plasmin-antiplasmin complex, though in normal plasm there is a sufficient excess of inhibitor to prevent activation. This dissociation explains the results of Macfarlan (1937), who found diluted plasma a more sensitive inde of fibrinolysis than whole blood. A similar effect o dilution has been observed on trypsin-antitrypsin mixtures (Hussey and Northrop 1923) and on toxin-antitoxin mixtures (Glenny and Barr 1932).


PLASMA
ALBUMIN
GLOBULIN
PLASMINOGEN
DISSOCIATED BY FRACTIONATION, DILUTION
ACTIVATED BY STREPTOKINASE, "SHOCK"
ANTIPLASMIN
PLASMIN
DESTROYED BY CHLOROFORM
FIBRINOLYSIS, PROTEOLYSIS

It is alteration of the plasmin-antiplasmin balance, therefore, that determines the presence or absence of fibrinolytic activity in blood. Alterations resulting in an increased activity have been observed as follows:

(1) Streptokinase increases the plasmin content of the plasma by activating available plasminogen, but does not appear greatly to affect the antiplasmin, a conclusion in conformity with that derived by Christensen and MacLeod (1945) by other methods.

(2) Chloroform destroys antiplasmin, thus releasing the plasmin normally in combination with it. It has been previously observed that the antiproteolytic action of serum is destroyed by chloroform (Jobling and Peterson 1914, Dale and Walpole 1916, Teale and Bach 1919).

PRESENCE OR ABSENCE OF FIBRINOLYSIS IN DILUTIONS OF PLASMA OR PLASMA FRACTIONS WITH VARIOUS REAGENTS, AND CONSTANT FIBRINOGEN

Exp	Reagents	Tube number and dilution of plasma or plasma fraction									
		1	2	3	4	5	6	7	8	9	10
		1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	1/1024	1/2048
A	Normal plasma	0	0	0	0	0	0	0	0	0	0
B	Normal plasma + streptokinase	0	0	0	+	+	+	+	+	+	0
C	"Chloroform plasma"	+	+	+	+	+	+	+	0	0	0
D	"Chloroform plasma" + streptokinase	+	+	+	+	+	+	+	+	+	
E	"Active plasma"	0	+	+	+	+	+	0	0	0	0
F	"Active plasma" + streptokinase	+	+	+	+	+	+	+	+	0	0
G	Normal globulin	+	+	+	+	+	0	0	0	0	0
H	Normal globulin + streptokinase	+	+	+	+	+	+	+	+	0	0
I	Normal albumin	0	0	0	0	0	0	0	0	0	0
J	Normal albumin + streptokinase	0	0	0	0	0	0	0	0	0	0
K	Normal albumin + normal globulin	0	0	0	0	0	0	0	0	0	0
L	"Chloroform" albumin + normal globulin	+	+	+	+	+	+	0	0	0	0
M	"Chloroform" globulin	+	+	+	+	+	+	+	+	0	0
N	Normal albumin + "chloroform" globulin	0	0	0	0	0	0	0	0	0	0
O	"Kinase" albumin + normal globulin	0	0	0	+	+	0	0	0	0	0
P	"Active" globulin	+	+	+	+	+	+	+	+	0	0
Q	Normal albumin + "active" globulin	0	0	0	0	0	0	0	0	0	0
R	"Active" albumin + normal globulin	0	+	+	+	+	0	0	0	0	0

uch an action was considered but rejected by Christensen and MacLeod (1945), who did not suppose that plasmin was normally present in the blood.

(3) The spontaneous fibrinolytic activity observed in our subjects is due to an increase in plasmin; and also, apparently, to a decrease in antiplasmin, an observation that requires further confirmation and investigation. The mechanism by which plasminogen is activated in these subjects is at present unknown.

The foregoing conclusions can be illustrated diagrammatically (see figure). Such a scheme, it is realised, is hypothetical, and further work may require fundamental alterations.

Our thanks are due to Dr. E. S. Duthie, of the Lister Institute, Elstree, for much advice and practical help, and to Dr. A. H. T. Robb-Smith for his encouragement and criticism. The general investigation of fibrinolysis is financed by the Medical Research Council.

REFERENCES

Christensen, L. R. (1944) *J. Bact.* 47, 65.
— (1945) *J. gen. Physiol.* 28, 363.
— MacLeod, C. M. (1945) *Ibid*, p. 559.
Dale, H. H., Walpole, G. S. (1916) *Biochem. J.* 10, 331.
Dastre, A. (1893) *Arch. Physiol.* 5, 661.
Delezenne, C., Pozerski, E. (1903) *C.R. Soc. Biol. Paris*, 55, 327, 690, 693.
Glenny, A. T., Barr, M. (1932) *J. Path. Bact.* 35, 91.
Hussey, R. G., Northrop, J. H. (1923) *J. gen. Physiol.* 5, 335.
Jobling, J. W., Peterson, W. (1914) *J. exp. Med.* 19, 459, 481.
Kaplan, M. H. (1944) *Proc. Soc. exp. Biol., N.Y.* 57, 40.
Macfarlane, R. G. (1937) *Lancet*, 1, 10.
Milstone, H. (1941) *J. Immunol.* 42, 109.
Nolf, P. (1905) *Arch. int. Physiol.* 3, 1.
— (1908) *Ibid*, 6, 306.
— (1921) *Ibid*, 16, 374; 18, 549.
— (1922) *Ibid*, 19, 227.
Opie, E. L., Barker, B. I. (1907) *J. exp. Med.* 9, 207.
Tagnon, H. J., Davidson, C. S., Taylor, F. H. L. (1942) *J. clin. Invest.* 21, 525, 533.
— Levenson, S. M., Davidson, C. S., Taylor, F. H. L. (1946) *Amer. J. med. Sci.* 211, 88.
Teale, F. H., Bach, E. (1919) *Proc. R. Soc. Med.* 13 (path.), 4, 43.
Yudin, S. S. (1936) *Pr. méd.* 44, 68.

EXERCISE AND CARDIAC HYPERTROPHY *

Sir ADOLPHE ABRAHAMS
O.B.E., M.D. Camb., F.R.C.P.
PHYSICIAN TO WESTMINSTER HOSPITAL AND TO THE INTERNATIONAL ATHLETIC BOARD; HONORARY MEDICAL OFFICER TO THE BRITISH OLYMPIC ATHLETIC TEAM

PHYSICIANS and physiologists differ in opinion on the subject of cardiac hypertrophy in response to exertion. On the one hand, there is the à priori expectation, the analogy of the musculature of the blacksmith's arm. On the other hand, there is the pronouncement of cardiologists that, provided the cardiac muscle is healthy and there is no valvular disease, hypertrophy does not develop even after the most severe physical exertion of which a human being is capable, whether that exertion be a repetition of occasions of supreme intensity or a long-continued submaximal effort: hypertrophy is regarded as evidence or proof of some pathological condition in the cardiovascular system or in some other system with cardiovascular repercussions. Though the present communication is intended as a criticism which may be at variance with previous experience and admit some vacillation in the retention of a long-established opinion, I have on clinical and radiographical grounds never found occasion to doubt that the healthy heart never hypertrophies, and this belief is founded on very considerable experience of athletes of every variety: of oarsmen; of runners at all distances, from sprinters to Marathon performers; of cyclists engaged in such feats as twenty-four hours' continuous pedalling; and of Channel swimmers.

Analogy with the blacksmith's arm may well be fallacious; cardiac muscle is not the same thing as voluntary skeletal muscle. Moreover, I have always felt that undue emphasis is laid on the function of the heart in considering the capacity for athletic distinction and regarding it as the limiting factor for endurance. Admittedly the work done by the heart in extreme exertion is of a very high order: each ventricle at maximal pressure delivers thirty-four litres of blood a minute. But, though the argument is specious, it seems to me a gratuitous assumption that, granted a peculiarly superlative circulation ensuring an unlimited provision of blood, a corresponding delay or avoidance of fatigue would result. The capacity for physical effort depends on various circumstances. It may well be that the superathlete owes his capability to the quality of his blood; to its viscosity, perhaps, or even to some subtle biochemical factor. It may be that his muscles have exceptional endowments for oxygen utilisation, for tolerance for lactic acid, or for the development of antibodies to ensure its neutralisation. Above all there is the nervous element, not only as a coördinating agent for the most perfect harmonisation of all the factors concerned but also from the psychological aspect.

Comparison with the lower animals is unconvincing. We may measure such details as stroke volume, circulation-rate, vital capacity, and oxygen debt. What are immeasurable and imponderable are such qualities as determination, stoicism, the ability to withstand discomfort and fatigue, or to endure the miseries of heat, cold, hunger, and thirst, and most of all in respect to long-continued exertion, monotony and boredom. The limiting factors of endurance are by no means restricted to the circulation.

AN ILLUSTRATIVE CASE

A man, aged 78, consulted Mr. G. T. Mullally for a swelling of the neck of three months' duration. His previous health had been consistently excellent; his activity until the last few weeks of his life had remained unimpaired. A tumour (probably malignant) of the thyroid gland compressing the œsophagus and invading the right external jugular vein was diagnosed, and deep X-ray therapy was undertaken. Sudden death took place shortly after the start of treatment.

As a necropsy was permitted, I requested particular attention to the heart and blood-vessels. I had not known the deceased in life, but his reputation as an athlete in his youth was of an almost legendary order. In the opinion of authorities he was the greatest long-distance cyclist of any generation. At the age of 18 he broke records for the bicycle and tricycle rides from Land's End to John o'Groats. During eleven years of incessant cycling he created nineteen national records. He had a partiality for the Land's End to John o'Groats achievement, and contemporary members of our profession warned him that every such performance reduced his life expectation by ten years. This effort he accomplished on twenty-four occasions.

After terminating his career as a long-distance cyclist he continued as an outstanding performer at cricket, hockey, swimming, and lawn tennis for the remainder of his life. As a professional soldier he took part in the 1914-18 war (lieut.-colonel and D.S.O.) and in the 1939-45 war with full duties in the Home Guard. I regret that no clinical details—e.g., cardiac rate and blood-pressure—are forthcoming. His height was 5 ft. 11 in., and his weight, which remained substantially unaltered throughout adult life, was just under 11 st. He was a non-smoker and almost a total abstainer from alcohol.

At the necropsy an embolus—the cause of death—was found in the left pulmonary artery.

The lungs were healthy and free from emphysema; there was adherence of the left pleura, with a calcified nodule at the left base. The heart was large, weighing 18 oz., but was "remarkably healthy for a man of his age." The muscle was firm and without fatty changes or infarctions. The coronary vessels were entirely free of atheroma. The aorta was in a remarkable state of health. The valves were normal; the aortic valves appeared larger than normal, measuring 4 cm. × 2 cm.

"The kidneys were quite normal, weight rt. 6 oz., lt. 8 oz. Liver, spleen (weight 4 oz.), and other viscera were quite normal."

DISCUSSION

Here is an example of a man who indulged in the most severe form of violent exercise in his youth for eleven years and in moderately strenuous exertion for the rest of his life; who survived with perfect health to the age of 78 to succumb to malignant growth of the thyroid and a fortuitous pulmonary embolus; at whose death a considerably hypertrophied heart was discovered, with complete absence of any disease in the cardiovascular system and a condition of exceptional healthiness of all viscera for a man of his age.

---

* A communication to the Association of Physicians, April, 1946.

It is generally accepted that species or even breeds of animals distinguished for muscular power have unusually large hearts. The ratio $\frac{\text{heart weight} \times 100}{\text{body-weight}}$ is always greater than 0·6 in those capable of severe continued exercise. The qualification *continued* must be stipulated, since animals with very small hearts are capable of extreme exertion for a short time if no considerable oxygen debt is incurred.

But this is not to presume that hypertrophy of the heart can be induced by severe exercise, and clinical and radiological investigations applied to athletes who indulge in long-distance events have provided little evidence of such effect. Admittedly, these investigations, however skilfully performed, are not conclusive. The only proof is that afforded by necropsy, and appropriate opportunities are exceptionally rare. Necropsies of subjects aged 78 are only too likely to reveal degene tive changes which are the usual consequence of a The factors of inactivity, gluttony, and intemperar all have a bearing; hence the responsibility of physi exertion in earlier life can rarely be incriminated as isolated factor.

I venture to advance two provocative alternativ as a lesson from this example. Either cardiac hyp trophy, analogous to muscular hypertrophy generall *does develop in response to violent exercise*; or sor human beings naturally possess exceptionally large hear and are constitutionally fitted for protracted exertion.

SUMMARY

An example is presented of a phenomenal athlet who died at the age of 78, in whom at necropsy cor siderable hypertrophy of the heart was revealed, bu whose cardiovascular system was in an extremely health state.

The relationship of cardiac hypertrophy to physica exertion is discussed.

I am greatly indebted to Mr. G. T. Mullally for permissio to record this note, and to Prof. R. J. V. Pulvertaft fo his generous coöperation in respect to the necropsy an information relating to the crucial details.

Reviews of Books

Atlas of Surgical Approaches to Bones and Joints

TOUFICK NICOLA, M.D., F.A.C.S., professor of orthopedics, New York Polyclinic. London: Macmillan. Pp. 218. 25*s*.

BY over 200 diagrams and black-and-white drawings, Professor Nicola cleverly and clearly represents the methods of approach to all bones and joints. The chief features are the large scale of the illustrations—almost life size—and the bold delineation of the structures. Here are no detailed anatomical drawings in the da Vinci style, nor loose impressionist effects, but bold, semi-diagrammatic drawings which certainly get their message across. The approaches are those that Nicola has found of value, and as such should be good enough for most of us. The majority are familiar, but some—such as the deltoid-displacing methods for the shoulder-joint—should be used more often. There are definite advantages in exposing the lumbar spinal cord with the patient in the lateral position, as he describes. For the young, this is a simple textbook of the essentials of orthopædic anatomy, for the old a quick reference work for use before a less familiar operation on bone or joint.

Carbohydrate Metabolism

SAMUEL SOSKIN, director of the research institute, Michael Reese Hospital, Chicago; and RACHMIEL LEVINE, director of metabolic and endocrine research at the hospital. London: Cambridge University Press. Pp. 315. 33*s*.

Claude Bernard's genius is emphasised in this book. The authors return again and again to the views of the great pioneer, upon whose work so much of our knowledge of carbohydrate metabolism is based. And in this the authors show their own greatness, for they set out to provide a book to be used for teaching, bringing the subject matter up to date, and presenting it suitably for the scientifically minded physician. Well designed and critically and sympathetically written, the book could only have been put together by men who had themselves thought and worked for many years at the subject. The diagrams and structural formulæ are helpful, and the summary, in the biochemical section, of the enzymatic processes involved in carbohydrate oxidation is very clear. The section criticising the classical criteria of diabetes is interesting, the authors piling up the evidence against the non-utilisation theory in an instructive manner. The rôle of the endocrine glands in carbohydrate metabolism is fully discussed, and with surprising simplicity. Some of the final chapters will appeal most to clinicians. Some aspects of carbohydrate metabolism which have been almost neglecte might with advantage have been included. The reference to, and accounts of, the pentose sugars for instanc are incomplete enough to be misleading, and there i little description of our growing knowledge of the sugar concerned in nucleic acid metabolism; but perhap these subjects hardly came within their terms o reference.

Symptomatic Diagnosis and Treatment of Gynæco logical Disorders

(2nd ed.) MARGARET MOORE WHITE, M.D., F.R.C.S. M.R.C.O.G., surgical specialist, Three Counties Emer gency Hospital. London: H. K. Lewis. Pp. 240 16*s*.

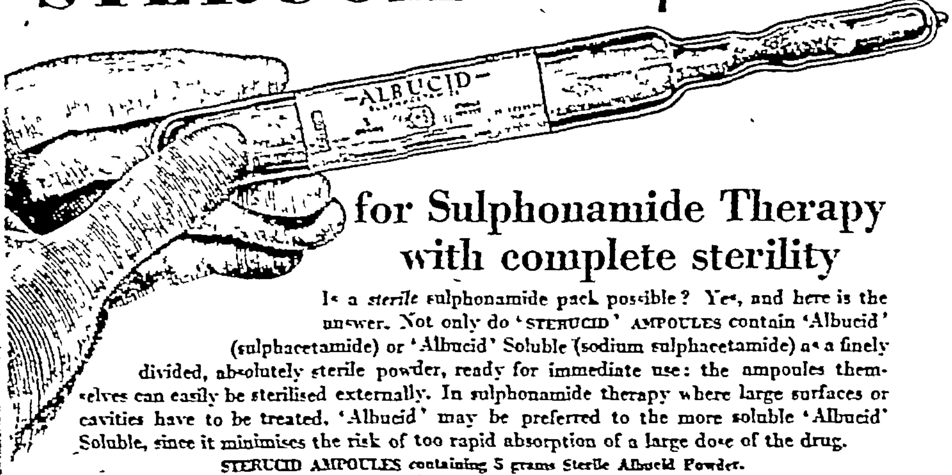
THIS small book, published in the "General Prac titioner" series, covers a wide territory and covers it well. The subject matter is up to date; the diagnosis and treatment are sound, and the illustrations graphic. Miss Moore White counsels expectant treatment in intratubal pregnancy with death of the fœtus, and in abortion of a separated tubal pregnancy. This may be safe for a surgeon of her diagnostic acumen and wide experience, but in writing for general practitioners such advice seems dangerous, since the extra-uterine pregnancy which is likely to bleed and the one which is not may easily be confused, with disastrous results for the patient. The chapter on sterility is among the best in any textbook of gynæcology, and a useful chapter on contraception has been contributed by Dr. Mary Redding. Irradiation therapy is discussed by Mr. I. G. Williams, who adequately covers the needs of general practice.

A Textbook of Surgery

(4th ed.) Editor: FREDERICK CHRISTOPHER, M.D., F.A.C.S., associate professor of surgery, Northwestern Univ sity, Chicago. London: W. B. Saunders. Pp. 1548. 60*s*.

THIS new edition has been revised and reset, and two new sections have been added on chemotherapy and military surgery. New readers may or may not dislike the double-column page; and there is some inevitable unevenness associated with the multiplicity of authors, so that the sections on the operative treatment of trigeminal neuralgia or spina bifida are as long as the whole section on tuberculosis of joints. But these are minor criticisms. The illustrations are everywhere good, particularly those of operative procedures, and the style is generally lucid and fluent. This book has always been among the transatlantic productions which British undergraduates could read with profit and pleasure and they will find it a useful adjunct to our own standard works.

‘STERUCID’ Ampoules

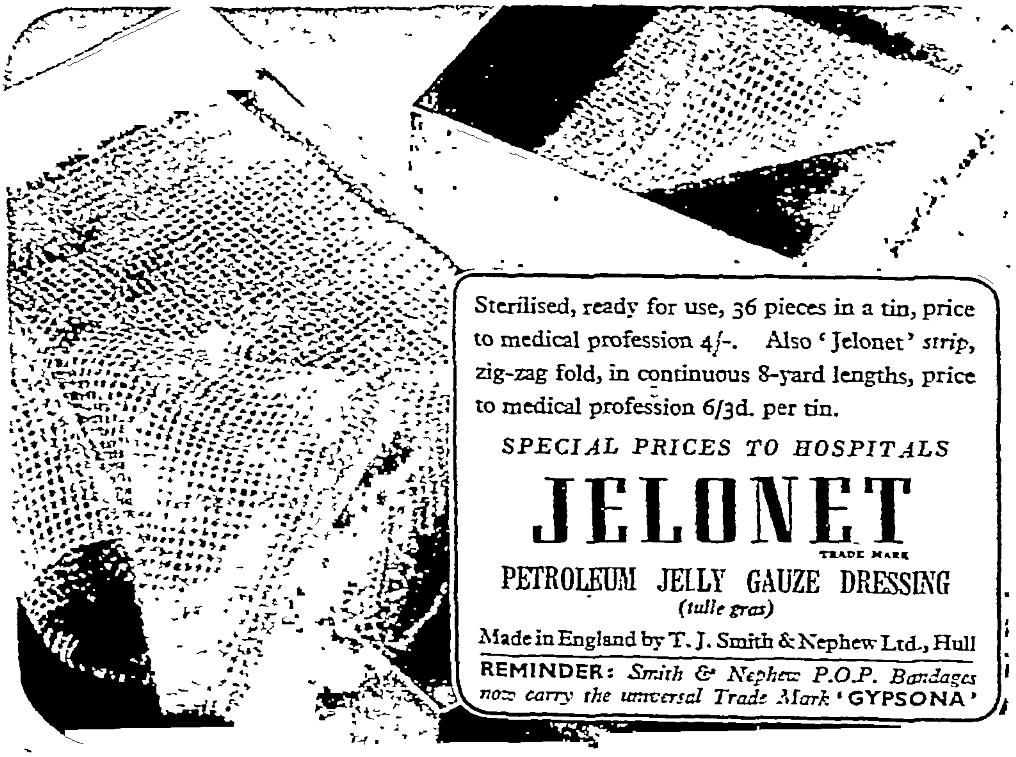


for Sulphonamide Therapy with complete sterility

Is a *sterile* sulphonamide pack possible? Yes, and here is the answer. Not only do ‘STERUCID’ AMPOULES contain ‘Albucid’ (sulphacetamide) or ‘Albucid’ Soluble (sodium sulphacetamide) as a finely divided, absolutely sterile powder, ready for immediate use: the ampoules themselves can easily be sterilised externally. In sulphonamide therapy where large surfaces or cavities have to be treated, ‘Albucid’ may be preferred to the more soluble ‘Albucid’ Soluble, since it minimises the risk of too rapid absorption of a large dose of the drug.

STERUCID AMPOULES containing 5 grams Sterile Albucid Powder.
STERUCID AMPOULES containing 5 grams Sterile Albucid Soluble Powder.
Fully descriptive literature will be sent on request.

BRITISH SCHERING LIMITED BS 167 169 Great Portland St., London, W.1



Sterilised, ready for use, 36 pieces in a tin, price to medical profession 4/-. Also ‘Jelonet’ *strip*, zig-zag fold, in continuous 8-yard lengths, price to medical profession 6/3d. per tin.

SPECIAL PRICES TO HOSPITALS

JELONET

TRADE MARK

PETROLEUM JELLY GAUZE DRESSING
(tulle gras)

Made in England by T. J. Smith & Nephew Ltd., Hull

REMINDER: *Smith & Nephew P.O.P. Bandages now carry the universal Trade Mark* ‘GYPSONA’ for eleven years and in moderately strenuous exertion for the rest of his life; who survived with perfect health to the age of 78 to succumb to malignant growth of the thyroid and a fortuitous pulmonary embolus; at whose death a considerably hypertrophied heart was discovered, with complete absence of any disease in the cardiovascular system and a condition of exceptional healthiness of all viscera for a man of his age.

It is generally accepted that species or even breeds of animals distinguished for muscular power have unusually large hearts. The ratio $\frac{\text{heart weight} \times 100}{\text{body-weight}}$ is always greater than 0·6 in those capable of severe continued exercise. The qualification *continued* must be stipulated, since animals with very small hearts are capable of extreme exertion for a short time if no considerable oxygen debt is incurred.

But this is not to presume that hypertrophy of the heart can be induced by severe exercise, and clinical and radiological investigations applied to athletes who indulge in long-distance events have provided little evidence of such effect. Admittedly, these investigations, however skilfully performed, are not conclusive. The only proof is that afforded by necropsy, and appropriate opportunities are exceptionally rare. Necropsies of subjects aged 78 are only too likely to reveal degenerative changes which are the usual consequence of age. The factors of inactivity, gluttony, and intemperance all have a bearing; hence the responsibility of physical exertion in earlier life can rarely be incriminated as an isolated factor.

I venture to advance two provocative alternatives as a lesson from this example. Either cardiac hypertrophy, analogous to muscular hypertrophy generally, does develop in response to violent exercise; or some human beings naturally possess exceptionally large hearts and are constitutionally fitted for protracted exertion.

SUMMARY

An example is presented of a phenomenal athlete, who died at the age of 78, in whom at necropsy considerable hypertrophy of the heart was revealed, but whose cardiovascular system was in an extremely healthy state.

The relationship of cardiac hypertrophy to physical exertion is discussed.

I am greatly indebted to Mr. G. T. Mullally for permission to record this note, and to Prof. R. J. V. Pulvertaft for his generous coöperation in respect to the necropsy and information relating to the crucial details.

Reviews of Books

Atlas of Surgical Approaches to Bones and Joints

Toufick Nicola, m.d., f.a.c.s., professor of orthopedics, New York Polyclinic. London: Macmillan. Pp. 218. 25*s*.

By over 200 diagrams and black-and-white drawings, Professor Nicola cleverly and clearly represents the methods of approach to all bones and joints. The chief features are the large scale of the illustrations—almost life size—and the bold delineation of the structures. Here are no detailed anatomical drawings in the da Vinci style, nor loose impressionist effects, but bold, semi-diagrammatic drawings which certainly get their message across. The approaches are those that Nicola has found of value, and as such should be good enough for most of us. The majority are familiar, but some—such as the deltoid-displacing methods for the shoulder-joint—should be used more often. There are definite advantages in exposing the lumbar spinal cord with the patient in the lateral position, as he describes. For the young, this is a simple textbook of the essentials of orthopædic anatomy, for the old a quick reference work for use before a less familiar operation on bone or joint.

Carbohydrate Metabolism

Samuel Soskin, director of the research institute, Michael Reese Hospital, Chicago; and Rachmiel Levine, director of metabolic and endocrine research at the hospital. London: Cambridge University Press. Pp. 315. 33*s*.

Claude Bernard's genius is emphasised in this book. The authors return again and again to the views of the great pioneer, upon whose work so much of our knowledge of carbohydrate metabolism is based. And in this the authors show their own greatness, for they set out to provide a book to be used for teaching, bringing the subject matter up to date, and presenting it suitably for the scientifically minded physician. Well designed and critically and sympathetically written, the book could only have been put together by men who had themselves thought and worked for many years at the subject. The diagrams and structural formulæ are helpful, and the summary, in the biochemical section, of the enzymatic processes involved in carbohydrate oxidation is very clear. The section criticising the classical criteria of diabetes is interesting, the authors piling up the evidence against the non-utilisation theory in an instructive manner. The rôle of the endocrine glands in carbohydrate metabolism is fully discussed, and with surprising simplicity. Some of the final chapters will appeal most to clinicians. Some aspects of carbohydrate metabolism which have been almost neglected might with advantage have been included. The references to, and accounts of, the pentose sugars for instance are incomplete enough to be misleading, and there is little description of our growing knowledge of the sugars concerned in nucleic acid metabolism; but perhaps these subjects hardly came within their terms of reference.

Symptomatic Diagnosis and Treatment of Gynæcological Disorders

(2nd ed.) Margaret Moore White, m.d., f.r.c.s., m.r.c.o.g., surgical specialist, Three Counties Emergency Hospital. London: H. K. Lewis. Pp. 246. 16*s*.

This small book, published in the "General Practitioner" series, covers a wide territory and covers it well. The subject matter is up to date; the diagnosis and treatment are sound, and the illustrations graphic. Miss Moore White counsels expectant treatment in intratubal pregnancy with death of the fœtus, and in abortion of a separated tubal pregnancy. This may be safe for a surgeon of her diagnostic acumen and wide experience, but in writing for general practitioners such advice seems dangerous, since the extra-uterine pregnancy which is likely to bleed and the one which is not may easily be confused, with disastrous results for the patient. The chapter on sterility is among the best in any textbook of gynæcology, and a useful chapter on contraception has been contributed by Dr. Mary Redding. Irradiation therapy is discussed by Mr. I. G. Williams, who adequately covers the needs of general practice.

A Textbook of Surgery

(4th ed.) Editor: Frederick Christopher, m.d., f.a.c.s., associate professor of surgery, Northwestern University, Chicago. London: W. B. Saunders. Pp. 1548. 50*s*.

This new edition has been revised and reset, and two new sections have been added on chemotherapy and military surgery. New readers may or may not dislike the double-column page; and there is some inevitable unevenness associated with the multiplicity of authors, so that the sections on the operative treatment of trigeminal neuralgia or spina bifida are as long as the whole section on tuberculosis of joints. But these are minor criticisms. The illustrations are everywhere good, particularly those of operative procedures, and the style is generally lucid and fluent. This book has always been among the transatlantic productions which British undergraduates could read with profit and pleasure, and they will find it a useful adjunct to our own standard works.

THE LANCET

LONDON: SATURDAY, OCT. 19, 1946

The Curtain

It is a great misfortune that so many doctors should dissociated from the Government's effort to create comprehensive medical service. Now that many of e desires and aspirations of the profession stand a hance of fulfilment, a substantial proportion of its embers seem to be chiefly concerned with the inconeniences and risks that are inseparable from any major change These inconveniences and risks are ery far from negligible, but they should not obscure he larger view presented once again in the Lords' ebate last week. In that debate one of our spokesmen ad to admit that in approaching the Bill "too many of the doctors have merely expressed their fears and prejudices" and "it has been left to the Minister to generate the momentum that overcomes obstacles and to enlist the strenuous support of ardent minds" The House of Lords at least showed itself aware of the significance of the project now being undertaken: "I am quite convinced," said the Archbishop of YORK, "that the National Insurance Act . . . and this Bill . . . will prove by far the greatest social reforms which have ever been passed by Parliament." Its evolutionary, rather than revolutionary, character was emphasised by Lord LISTOWEL: there has been, he pointed out, a deplorable hiatus between the progress of medicine and its social application, and "as a citizen of a country which still cares about social justice and the intangibles that really matter" he welcomed a measure which "by its inclusiveness, by its more even distribution of the nation's medical resources, and most of all by breaking the cash nexus between medicine and the individual, will remove the gravest of the present obstacles to one of the most important forms of equality of opportunity." Lord BEVERIDGE approved of the Bill as giving effect to the vital principle that bread and health for everybody should come before cake and circuses for some. It sets up for the first time, he said, a true Ministry of Health ("a national authority with the duty and with the power of attacking disease as a national enemy") and it means that the medical profession will now be a service rather than in any way a business.

So much for intentions. But, as Lord ADDINGTON remarked, under the new régime "the love, care, and consideration which are so essential to healing cannot be exercised if there is friction between the doctors and the Government or between the doctors and the patients"; and the LORD CHANCELLOR agreed that it would be very foolish to construct the scheme on the basis of a disgruntled and dissatisfied profession. Unhappily that is just what a great many doctors are today—distinctly disgruntled. And perhaps the main reason for their state of mind is that they suppose that the Minister of Health, receiving plenary powers from a political majority, is not paying, and need never pay, any attention at all to the views of their representatives. People who have closely followed the development of the plan for a comprehensive medical service know that, as Lord LISTOWEL argued, it is the outcome of a concerted effort, over a long period of years, in which every view of any importance has been given a fair hearing and prolonged and serious consideration. Nevertheless Mr. BEVAN's treatment of the Negotiating Committee has made it just possible for opponents to assert that the scheme in its final form was thrust on the profession "without consultation." Though he listened repeatedly to the committee's views, expressed both collectively and individually, he believed, rightly or wrongly, that the shaping of the main policy was a matter for himself and Parliament, not to be prejudiced by bargaining in advance. Thus, though there were consultations, it is true that there were, strictly speaking, no negotiations.

Mr. BEVAN evidently looks forward to detailed discussions later; which indeed will be essential. Meanwhile, however, the failure to achieve more genuine coöperation—a failure for which both parties bear some responsibility—has proved singularly unfortunate. Its most conspicuous result at the moment is the trouble over the National Health Insurance capitation fee. The Minister, while recognising that in the light of the Spens report the remuneration of panel practitioners must be increased, was naturally unwilling to discuss this subject except in its relation to remuneration in the National Health Service which will supersede National Health Insurance in eighteen months' time. The Insurance Acts Committee, on the other hand, demanding immediate action on the Spens Committee's findings, declined to discuss remuneration in some hypothetical service which may or may not materialise in 1948. On their refusal, the Minister increased the capitation fee by 2s. as a token payment without prejudice—an action which has apparently led countless practitioners to think that such matters will never be decided on their merits, and that, even in a National Health Service, the Ministry will never change its spots. We are thankful to hear of the Minister's new approach; for though both sides have a good case, there is really less need of good cases than of good will.

But mere appeasement between two separate parties—the Ministry and the profession—is not of course enough: we have to construct an organisation whose different parts work harmoniously to a common end. This has to be done, moreover, without dictatorship. Much of the anxiety of the profession arises, as Lord HORDER said, from the centralisation of power in one man, who was compared by several speakers to the commander-in-chief of an army. Lord LISTOWEL gave an assurance that the Minister's duty will be to exercise direction rather than control; and Mr. BEVAN has recognised that every professional member of the new service must remain responsible for his own work. The Archbishop of YORK did well, however, to point out that the staff of the commander-in-chief "will consist largely of those who live and work in Whitehall, and probably the majority of them will be people who have never practised within this profession and fail to understand its spirit" Though the scheme provides mechanisms through which the profession at all stages can profoundly influence the development and administration of the service, "the Minister"—which usually means "the Ministry"—could no doubt by bureaucratic action do much to defeat the object of those who have designed these mechanisms. Against this the best safeguard is that the Minister's staff should include many men who are for part of their

PENICILLIN

AND B.D.H. PREPARATIONS OF PENICILLIN

The B.D.H. range of Penicillin preparations includes:

PENICILLIN

Vial containing 100,000 int. units
Vial containing 200,000 int. units
Vial containing 500,000 int. units
Vial containing 1,000,000 int. units

PENICILLIN (Oil-wax) SUSPENSION B.D.H.
(Oily Injection of Penicillin B.P.)
Vial containing 10 ml.
Vial containing 20 ml.

PENICILLIN EYE OINTMENT B.D.H.
(Penicillin Ointment for the Eye B.P.)
Collapsible tube of 1 drm.

PENICILLIN LOZENGES B.D.H.
(Lozenges of Penicillin B.P.)
Container of 50

PENICILLIN OINTMENT B.D.H.
(Ointment of Penicillin B.P.)
Container of 1 oz.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London

Pen/E/52

HORMONES ORGANON

Physiological Agents for Precision Therapy

HORMONES

Oestrogens
Androgens
Progestogens
Desoxycorticosterone acetate

Gonadotrophins
Thyrotrophin
Corticotrophin
Whole anterior pituitary extract

LIVER EXTRACT and VITAMINS

Also the following antagonistic substances:

METHYL THIOURACIL · DICOUMARIN

For literature, etc., send card to

ORGANON LABORATORIES LIMITED
BRETTENHAM HOUSE, LONDON, W.C.2

TEMPLE BAR 6785 MENFORMON, RAND, LONDON

AGENTS THROUGHOUT THE BRITISH EMPIRE AND MOST OVERSEAS TERRITORIES

Pioneers in Hormone Research

navigation, needlework, or darts. The chief feature that the homes have in common is that patients go there after an illness expecting to get better without further active treatment. Almshouses may therefore be excluded from the definition—whatever that is finally decided to be—and classed among provisions for the old; for no-one expects to get better of old age. And so may the active reablement centres which have developed in the last few years, for in these the patients are as much under treatment as they were in hospital, though at a later stage of recovery.

English convalescent homes range in size from those taking more than 200 to those taking less than 20 people; and though those who are planning our National Health Service are said to prefer large units there is little doubt that patients prefer small homes of 10 to 20 beds, especially when these are run with friendly personal touch. The existing homes vary n this, of course, as in everything else: in one home he children make a friendly rush at the chairman the moment he appears, and the matron speaks of the patients by name; in another the efficient filing system s the keynote of the institution, and the patients are called cases. There is the story of the old lady in a large, clean, airy, perfectly run home in Prague who said with a sigh, "There's nothing left but tidiness." The English may respect institutions but are peculiarly ill-fitted for living in them. The main argument in favour of large hospitals—that only they can afford the special equipment and personnel required for modern diagnosis and treatment—does not apply to the general run of homes for convalescents, who need neither apparatus nor highly skilled care. It does, however, apply to the reablement centres which aim, by active and often complex and expensive methods, to get working men and women back to their jobs. In the no-treatment home large size is a handicap, for it necessitates a medical and nursing staff, whereas the small home can rely on local practitioners to attend to minor ailments and keep an eye open for unexpected complications. The small home where the matron and committee know the patients personally, and where freedom is respected, cups of tea can be had without formality, and no-one is sent packing because he drinks a glass of beer in the local inn, is clearly the right kind for English convalescents.

Variety and small size, then, are qualities in convalescent homes which we should strive to keep. Their weakness lies in their having no connecting link, no central body to which inquiries can be addressed by almoners and others trying to place a patient, or to which the homes themselves can look for advice or help in moments of difficulty. Some degree of central supervision would clearly improve the service that the homes can offer: and most homes would welcome it as relieving them of the responsibility inherent in isolation. A central organisation would simplify the task of almoners: for though there is probably a suitable type of home for anyone who needs it, there is not always a bed waiting for a particular patient at a particular moment; or, if there is, the almoner has no means of knowing it. The central organisation could set up a simple form of admission bureau, on the lines of the bed service run by the King's Fund in London for emergency admissions to hospitals. As a first step the King's Fund and the Institute of Almoners are preparing a detailed list of homes, based on personal inspection. This will meet a real need, and will also show which groups of people are poorly served by the homes already existing, and possibly which have more opportunities for convalescence than they require.

Annotations

WINTER IN EUROPE

IN Europe this winter, and particularly in the occupied zones, hardship is likely to be extreme. The Control Commission recently announced that during the last week of July, in the British zone of Germany, 12 people died of hunger, while 1189 cases of famine œdema were reported in Hamburg alone. During six months the new-case rate of tuberculosis, it was stated, rose by a third. In a pamphlet lately issued,[1] Viennese rations for a day during the past summer are described by Mr. G. E. R. Gedye.[2] They were two rounds of bread (under 9 oz.), a teaspoonful of sugar, a tablespoonful of coffee and coffee substitute, half a square inch of sausage and an equal amount of tinned ham, a tablespoonful each of maize flour, dried peas, oatmeal, and lard, a seventh share in a shell egg, a pinch of egg powder, half a soup cube, a dessertspoonful of salt, and two tablespoonfuls of meat-and-vegetable ration (three-quarters vegetable): the total calorie value being estimated at 1181—about half the figure (2200) regarded as adequate for a non-worker. These embittering privations can only be ended by good harvests and political decisions; but in the meantime there is room and to spare for voluntary effort.

Since 1945 British voluntary societies have been doing welfare work in the British zone of Germany.[3] They are grouped in teams of 12 and represent the British Red Cross and Order of St. John, the Friends Relief Service and Friends Ambulance Unit, the Salvation Army, the Girl Guides, the Save the Children Fund, the Catholic Committee for Relief Abroad, and the International Voluntary Service for Peace. Many of these bodies, of course, are sending help to other distressed countries—to France, Poland, Austria, Italy, Yugoslavia, and Greece. The relief workers in Germany receive their rations, petrol, and other stores through the Army, and use Army vehicles; but they are not paid or regulated by the Army and many of them receive no pay at all. They began by caring for refugees and victims of epidemics and starvation in Normandy, Belgium, Holland, and Rhineland, while the fighting was still going on; later they helped to repatriate displaced persons of Allied nationality in Germany. Later still some of them became free to give help to the German population, and additional teams arrived from England to supplement them. Supplies of course are limited, and are used primarily for children, sick people, and the aged. Wherever possible German organisations which understand local needs are asked to help with distribution.

In towns with a population over 5000 the education branch of Control Commission has arranged for schoolchildren to receive a coupon-free midday meal; and supplementary feeding schemes for children under school age have been arranged by the relief teams. The Swedish Red Cross and the Swiss relief organisation known as Don Suisse are helping with this work. Swedish teams in the Ruhr have provided a daily hot meal for 120,000 children in the past six months, and Don Suisse time actually engaged in the practice of medicine. "It is only in this way," said Lord MORAN, "that you can lift the curtain which in recent years has fallen between the Ministry and the profession, leaving so much want of sympathy and understanding." And in this he was endorsing the far-seeing policy by which Sir WILSON JAMESON has been widening the medical staff of the Ministry and intends to widen it further.[1]

---

[1] Have You Thought What Winter will be Like in Europe this Year? Issued by Save Europe Now, 14, Henrietta Street, London, W.C.2.

[2] Reprinted from the *Tribune* of August 2.

[3] Council of British Societies for Relief Abroad. Leaflet, September, 1946. 75, Victoria Street, London, S.W.1.

The new service will succeed if those who hold office in it, whether medical or lay, prove themselves colleagues and are trusted accordingly. The immediate necessity, however, is effective consultation over the framing of the regulations which will bring the service to life. In these consultations our representatives can certainly wield their proper influence, and they can also prove their readiness for real coöperation. The Government, as Lord ADDINGTON said, has yet to win the confidence of the medical profession and the public; but the profession might itself do more to gain the confidence of its associates in a great, and now inevitable, undertaking.

---

[1] See *Lancet*, 1945, ii, 569.

Circulatory Effects of Osteitis Deformans

WHEN Sir JAMES PAGET[1] described the generalised disease of bone now known by his name he recognised that the bones were hyperæmic, and this led him to think of an inflammatory cause and hence to use the term "osteitis." Orthopædic and cranial surgeons are familiar with the highly vascular state of the affected bones at operation, and CONE,[2] in his studies of the bone pathology, emphasised the importance of this feature. KLIPPEL and WEIL[3] in 1908 observed that the temperature of the skin over an affected bone was higher than normal. For a long time cardiovascular complications of the generalised form of Paget's disease have been recognised. KAY and others[4] were struck by the frequency of high pulse-pressures in a series which they studied. Out of 33 cases, 14 had pulse-pressures over 60 mm. Hg. Cardiac enlargement was often noted, as were systolic murmurs over the precordium. Even in cases in whom the Korotkoff sounds could be heard right down to zero pressure, there was no satisfactory evidence of aortic valvular disease. KAY and his colleagues and also SNAPPER[5] ascribed these findings to arteriosclerosis.

Further light has now been thrown on these phenomena by a detailed study[6] of a case in the British Postgraduate Medical School. A patient with generalised Paget's disease had venous congestion and œdema. Cardiac catheterisation showed that his cardiac output was 13·3 litres per minute, or nearly three times the normal average. This is a state of affairs somewhat similar to that found in arteriovenous aneurysms, and in fact closing the circulation through the legs of this patient produced effects on the general circulation similar to those seen when an arteriovenous aneurysm is partially shut off, including slowing of the pulse and a slight rise in diastolic arterial pressure. This led the investigators to believe that the circulatory phenomena might be explained by a great increase in blood-flow through the affected bones. Direct study of the bone blood-flow was then undertaken. It was shown that when one tibia only is affected by Paget's disease the flow through that leg may be five to seven times as high as that in the normal leg. By an ingenious adaptation of the Grant-Lewis plethysmograph the actual bone blood-flow was estimated in the humerus of a normal person and the patient with Paget's disease. It was found that the normal flow was probably about 1 c.cm. per 100 c.cm. of bone per minute, while that through Paget's bones was about 20 c.cm. Applying these figures to the whole skeleton, the total skeletal blood-flow is normally about 75 c.cm. per minute, while the enlarged skeleton of the case of generalised Paget's disease received a blood-flow of about 3·3 litres per minute.

This work is an important contribution to the living pathology of Paget's disease, but it is also the first time that bone blood-flow has been measured in man. It adds another thought-provoking instance to the group of conditions in which "cardiac failure" is associated with high output, of which severe anæmia constitutes a well-established example.[7] Comprehension of the nature and sequence of events in these cases of apparent heart-failure would shed much light on other ordinary forms of heart-failure, and we may look forward to further results of such research in the next few years.

---

1. Paget, J. *Med.-chir. Trans.* 1876–77, 60, 37.
2. Cone, S. M. *J. Bone Jt Surg.* 1922, 4, 751.
3. Klippel, M., Weil, M. P. *Rev. neurol.* 1908, 16, 1228.
4. Kay, H. D., Simpson, S. L., Riddoch, G., Vilvandré, G. E. *Arch. intern. Med.* 1934, 53, 208.
5. Snapper, I. Medical Clinics on Bone Diseases, New York, 1943.
6. Edholm, O. G., Howarth, S., McMichael, J. *Clin. Sci.* 1945, 5, 249.
7. Sharpey-Schafer, E. P. *Lancet*, 1946, ii, 296.

The Convalescent Home

"LET not thy left hand know what thy right hand doeth," however apt as advice on personal almsgiving, is hardly a suitable maxim for charitable institutions. Yet convalescent homes in England have grown up on this isolationist plan, each pursuing a course of its own, knowing nothing of its neighbour in the next street. No complete list of convalescent homes has ever been compiled; even the Public Health Act of 1936 did not call for a complete survey; and hospital almoners, local health officers, and practitioners must make their own lists of openings available for their patients recovering from illness. Many homes were closed during the war and not all have opened again. Moreover, there is no clear definition of the term "convalescent home." Some offer treatment, others none; some will not take patients for more than a month, others will not take them for less; some insist that patients must be able to look after themselves, others will take the bed-ridden; some of the children's homes are special schools approved by the Ministry of Education, others are not. At many, patients must conform to certain criteria—they must be of a given sex or age-group, or must belong to a given religious sect, fraternity, friendly society, or social class, or must work at or be retired from a given occupation, including the Services, or must live in a given district. The variety of our convalescent homes is an advantage, for the restrictions on the type of patient are designed to make those who are accepted feel more at home, the first essential for pleasant convalescence. A merchant seaman, a distressed gentlewoman, and a resident of West Ham, placed in one home, might be poor company for each other, but they will be at ease among those who share their tastes, whether in

navigation, needlework, or darts. The chief feature that the homes have in common is that patients go there after an illness expecting to get better without further active treatment. Almshouses may therefore be excluded from the definition—whatever that is finally decided to be—and classed among provisions for the old; for no-one expects to get better of old age. And so may the active reablement centres which have developed in the last few years, for in these the patients are as much under treatment as they were in hospital, though at a later stage of recovery.

English convalescent homes range in size from those taking more than 200 to those taking less than 20 people; and though those who are planning our National Health Service are said to prefer large units there is little doubt that patients prefer small homes of 10 to 20 beds, especially when these are run with a friendly personal touch. The existing homes vary in this, of course, as in everything else: in one home the children make a friendly rush at the chairman the moment he appears, and the matron speaks of the patients by name; in another the efficient filing system is the keynote of the institution, and the patients are called cases. There is the story of the old lady in a large, clean, airy, perfectly run home in Prague who said with a sigh, "There's nothing left but tidiness." The English may respect institutions but are peculiarly ill-fitted for living in them. The main argument in favour of large hospitals—that only they can afford the special equipment and personnel required for modern diagnosis and treatment—does not apply to the general run of homes for convalescents, who need neither apparatus nor highly skilled care. It does, however, apply to the reablement centres which aim, by active and often complex and expensive methods, to get working men and women back to their jobs. In the no-treatment home large size is a handicap, for it necessitates a medical and nursing staff, whereas the small home can rely on local practitioners to attend to minor ailments and keep an eye open for unexpected complications. The small home where the matron and committee know the patients personally, and where freedom is respected, cups of tea can be had without formality, and no-one is sent packing because he drinks a glass of beer in the local inn, is clearly the right kind for English convalescents.

Variety and small size, then, are qualities in convalescent homes which we should strive to keep. Their weakness lies in their having no connecting link, no central body to which inquiries can be addressed by almoners and others trying to place a patient, or to which the homes themselves can look for advice or help in moments of difficulty. Some degree of central supervision would clearly improve the service that the homes can offer: and most homes would welcome it as relieving them of the responsibility inherent in isolation. A central organisation would simplify the task of almoners: for though there is probably a suitable type of home for anyone who needs it, there is not always a bed waiting for a particular patient at a particular moment; or, if there is, the almoner has no means of knowing it. The central organisation could set up a simple form of admission bureau, on the lines of the bed service run by the King's Fund in London for emergency admissions to hospitals. As a first step the King's Fund and the Institute of Almoners are preparing a detailed list of homes, based on personal inspection. This will meet a real need, and will also show which groups of people are poorly served by the homes already existing, and possibly which have more opportunities for convalescence than they require.

Annotations

WINTER IN EUROPE

IN Europe this winter, and particularly in the occupied zones, hardship is likely to be extreme. The Control Commission recently announced that during the last week of July, in the British zone of Germany, 12 people died of hunger, while 1180 cases of famine œdema were reported in Hamburg alone. During six months the new-case rate of tuberculosis, it was stated, rose by a third. In a pamphlet lately issued,[1] Viennese rations for a day during the past summer are described by Mr. G. E. R. Gedye.[2] They were two rounds of bread (under 9 oz.), a teaspoonful of sugar, a tablespoonful of coffee and coffee substitute, half a square inch of sausage and an equal amount of tinned ham, a tablespoonful each of maize flour, dried peas, oatmeal, and lard, a seventh share in a shell egg, a pinch of egg powder, half a soup cube, a dessertspoonful of salt, and two tablespoonfuls of meat-and-vegetable ration (three-quarters vegetable): the total calorie value being estimated at 1181—about half the figure (2200) regarded as adequate for a non-worker. These embittering privations can only be ended by good harvests and political decisions; but in the meantime there is room and to spare for voluntary effort.

Since 1945 British voluntary societies have been doing welfare work in the British zone of Germany.[3] They are grouped in teams of 12 and represent the British Red Cross and Order of St. John, the Friends Relief Service and Friends Ambulance Unit, the Salvation Army, the Girl Guides, the Save the Children Fund, the Catholic Committee for Relief Abroad, and the International Voluntary Service for Peace. Many of these bodies, of course, are sending help to other distressed countries—to France, Poland, Austria, Italy, Yugoslavia, and Greece. The relief workers in Germany receive their rations, petrol, and other stores through the Army, and use Army vehicles; but they are not paid or regulated by the Army and many of them receive no pay at all. They began by caring for refugees and victims of epidemics and starvation in Normandy, Belgium, Holland, and Rhineland, while the fighting was still going on; later they helped to repatriate displaced persons of Allied nationality in Germany. Later still some of them became free to give help to the German population, and additional teams arrived from England to supplement them. Supplies of course are limited, and are used primarily for children, sick people, and the aged. Wherever possible German organisations which understand local needs are asked to help with distribution.

In towns with a population over 5000 the education branch of Control Commission has arranged for school-children to receive a coupon-free midday meal; and supplementary feeding schemes for children under school age have been arranged by the relief teams. The Swedish Red Cross and the Swiss relief organisation known as Don Suisse are helping with this work. Swedish teams in the Ruhr have provided a daily hot meal for 120,000 children in the past six months, and Don Suisse time actually engaged in the practice of medicine. "It is only in this way," said Lord **Moran**, "that you can lift the curtain which in recent years has fallen between the Ministry and the profession, leaving so much want of sympathy and understanding." And in this he was endorsing the far-seeing policy by which Sir **Wilson Jameson** has been widening the medical staff of the Ministry and intends to widen it further.[1]

---

[1] Have You Thought What Winter will be Like in Europe this Year? Issued by Save Europe Now, 14, Henrietta Street, London, W.C.2.

[2] Reprinted from the *Tribune* of August 2.

[3] Council of British Societies for Relief Abroad. Leaflet, September, 1946. 75, Victoria Street, London, S.W.1.

The new service will succeed if those who hold office in it, whether medical or lay, prove themselves colleagues and are trusted accordingly. The immediate necessity, however, is effective consultation over the framing of the regulations which will bring the service to life. In these consultations our representatives can certainly wield their proper influence, and they can also prove their readiness for real coöperation. The Government, as Lord **Addington** said, has yet to win the confidence of the medical profession and the public; but the profession might itself do more to gain the confidence of its associates in a great, and now inevitable, undertaking.

Circulatory Effects of Osteitis Deformans

When Sir **James Paget**[1] described the generalised disease of bone now known by his name he recognised that the bones were hyperæmic, and this led him to think of an inflammatory cause and hence to use the term "osteitis." Orthopædic and cranial surgeons are familiar with the highly vascular state of the affected bones at operation, and **Cone**,[2] in his studies of the bone pathology, emphasised the importance of this feature. **Klippel** and **Weil**[3] in 1908 observed that the temperature of the skin over an affected bone was higher than normal For a long time cardiovascular complications of the generalised form of Paget's disease have been recognised. **Kay** and others[4] were struck by the frequency of high pulse-pressures in a series which they studied. Out of 33 cases, 14 had pulse-pressures over 60 mm. Hg. Cardiac enlargement was often noted, as were systolic murmurs over the precordium. Even in cases in whom the Korotkoff sounds could be heard right down to zero pressure, there was no satisfactory evidence of aortic valvular disease. **Kay** and his colleagues and also **Snapper**[5] ascribed these findings to arteriosclerosis.

Further light has now been thrown on these phenomena by a detailed study[6] of a case in the British Postgraduate Medical School. A patient with generalised Paget's disease had venous congestion and œdema. Cardiac catheterisation showed that his cardiac output was 13·3 litres per minute, or nearly three times the normal average. This is a state of affairs somewhat similar to that found in arteriovenous aneurysms, and in fact closing the circulation through the legs of this patient produced effects on the general circulation similar to those seen when an arteriovenous aneurysm is partially shut off, including slowing of the pulse and a slight rise in diastolic arterial pressure. This led the investigators to believe that the circulatory phenomena might be explained by a great increase in blood-flow through the affected bones Direct study of the bone blood-flow was then undertaken. It was shown that when one tibia only is affected by Paget's disease the flow through that leg may be five to seven times as high as that in the normal leg. By an ingenious adaptation of the Grant-Lewis plethysmograph the actual bone blood-flow was estimated in the humerus of a normal person and the patient with Paget's disease. It was found that the normal flow was probably about 1 c.cm. per 100 c.cm. of bone per minute, while that through Paget's bones was about 20 c.cm. Applying these figures to the whole skeleton, the total skeletal blood-flow is normally about 75 c.cm. per minute, while the enlarged skeleton of the case of generalised Paget's disease received a blood-flow of about 3·3 litres per minute.

This work is an important contribution to the living pathology of Paget's disease, but it is also the first time that bone blood-flow has been measured in man. It adds another thought-provoking instance to the group of conditions in which "cardiac failure" is associated with high output, of which severe anæmia constitutes a well-established example.[7] Comprehension of the nature and sequence of events in these cases of apparent heart-failure would shed much light on other ordinary forms of heart-failure, and we may look forward to further results of such research in the next few years.

The Convalescent Home

"Let not thy left hand know what thy right hand doeth," however apt as advice on personal almsgiving, is hardly a suitable maxim for charitable institutions Yet convalescent homes in England have grown up on this isolationist plan, each pursuing a course of its own, knowing nothing of its neighbour in the next street. No complete list of convalescent homes has ever been compiled; even the Public Health Act of 1936 did not call for a complete survey; and hospital almoners, local health officers, and practitioners must make their own lists of openings available for their patients recovering from illness. Many homes were closed during the war and not all have opened again. Moreover, there is no clear definition of the term "convalescent home." Some offer treatment, others none; some will not take patients for more than a month, others will not take them for less; some insist that patients must be able to look after themselves, others will take the bed-ridden; some of the children's homes are special schools approved by the Ministry of Education, others are not. At many, patients must conform to certain criteria—they must be of a given sex or age-group, or must belong to a given religious sect, fraternity, friendly society, or social class, or must work at or be retired from a given occupation, including the Services, or must live in a given district. The variety of our convalescent homes is an advantage, for the restrictions on the type of patient are designed to make those who are accepted feel more at home, the first essential for pleasant convalescence. A merchant seaman, a distressed gentlewoman, and a resident of West Ham, placed in one home, might be poor company for each other, but they will be at ease among those who share their tastes, whether in

navigation, needlework, or darts. The chief feature that the homes have in common is that patients go there after an illness expecting to get better without further active treatment. Almshouses may therefore be excluded from the definition—whatever that is finally decided to be—and classed among provisions for the old; for no-one expects to get better of old age. And so may the active reablement centres which have developed in the last few years, for in these the patients are as much under treatment as they were in hospital, though at a later stage of recovery.

---

[1] See *Lancet*, 1945, ii, 569.

[1] Paget, J. *Med.-chir. Trans.* 1876–77, 60, 37.
[2] Cone, S. M. *J. Bone Jt Surg.* 1922, 4, 751.
[3] Klippel, M., Weil, M. P. *Rev. neurol.* 1908, 16, 1228.
[4] Kay, H. D., Simpson, S. L., Riddoch, G., Vilvandre, G. E. *Arch. intern. Med.* 1934, 53, 208.
[5] Snapper, I. Medical Clinics on Bone Diseases, New York, 1943.
[6] Edholm, O. G., Howarth, S., McMichael, J. *Clin. Sci.* 1945, 5, 249.

[7] Sharpey-Schafer, E. P. *Lancet*, 1945, ii, 296.

English convalescent homes range in size from those taking more than 200 to those taking less than 20 people; and though those who are planning our National Health Service are said to prefer large units there is little doubt that patients prefer small homes of 10 to 20 beds, especially when these are run with a friendly personal touch. The existing homes vary in this, of course, as in everything else: in one home the children make a friendly rush at the chairman the moment he appears, and the matron speaks of the patients by name; in another the efficient filing system is the keynote of the institution, and the patients are called cases. There is the story of the old lady in a large, clean, airy, perfectly run home in Prague who said with a sigh, "There's nothing left but tidiness." The English may respect institutions but are peculiarly ill-fitted for living in them. The main argument in favour of large hospitals—that only they can afford the special equipment and personnel required for modern diagnosis and treatment—does not apply to the general run of homes for convalescents, who need neither apparatus nor highly skilled care. It does, however, apply to the reablement centres which aim, by active and often complex and expensive methods, to get working men and women back to their jobs. In the no-treatment home large size is a handicap, for it necessitates a medical and nursing staff, whereas the small home can rely on local practitioners to attend to minor ailments and keep an eye open for unexpected complications. The small home where the matron and committee know the patients personally, and where freedom is respected, cups of tea can be had without formality, and no-one is sent packing because he drinks a glass of beer in the local inn, is clearly the right kind for English convalescents.

Variety and small size, then, are qualities in convalescent homes which we should strive to keep. Their weakness lies in their having no connecting link, no central body to which inquiries can be addressed by almoners and others trying to place a patient, or to which the homes themselves can look for advice or help in moments of difficulty. Some degree of central supervision would clearly improve the service that the homes can offer: and most homes would welcome it as relieving them of the responsibility inherent in isolation. A central organisation would simplify the task of almoners: for though there is probably a suitable type of home for anyone who needs it, there is not always a bed waiting for a particular patient at a particular moment; or, if there is, the almoner has no means of knowing it. The central organisation could set up a simple form of admission bureau, on the lines of the bed service run by the King's Fund in London for emergency admissions to hospitals. As a first step the King's Fund and the Institute of Almoners are preparing a detailed list of homes, based on personal inspection. This will meet a real need, and will also show which groups of people are poorly served by the homes already existing, and possibly which have more opportunities for convalescence than they require.

Annotations

WINTER IN EUROPE

In Europe this winter, and particularly in the occupied zones, hardship is likely to be extreme. The Control Commission recently announced that during the last week of July, in the British zone of Germany, 12 people died of hunger, while 1180 cases of famine œdema were reported in Hamburg alone. During six months the new-case rate of tuberculosis, it was stated, rose by a third. In a pamphlet lately issued,[1] Viennese rations for a day during the past summer are described by Mr. G. E. R. Gedye.[2] They were two rounds of bread (under 9 oz.), a teaspoonful of sugar, a tablespoonful of coffee and coffee substitute, half a square inch of sausage and an equal amount of tinned ham, a tablespoonful each of maize flour, dried peas, oatmeal, and lard, a seventh share in a shell egg, a pinch of egg powder, half a soup cube, a dessertspoonful of salt, and two tablespoonfuls of meat-and-vegetable ration (three-quarters vegetable): the total calorie value being estimated at 1181—about half the figure (2200) regarded as adequate for a non-worker. These embittering privations can only be ended by good harvests and political decisions; but in the meantime there is room and to spare for voluntary effort.

Since 1945 British voluntary societies have been doing welfare work in the British zone of Germany.[3] They are grouped in teams of 12 and represent the British Red Cross and Order of St. John, the Friends Relief Service and Friends Ambulance Unit, the Salvation Army, the Girl Guides, the Save the Children Fund, the Catholic Committee for Relief Abroad, and the International Voluntary Service for Peace. Many of these bodies, of course, are sending help to other distressed countries—to France, Poland, Austria, Italy, Yugoslavia, and Greece. The relief workers in Germany receive their rations, petrol, and other stores through the Army, and use Army vehicles; but they are not paid or regulated by the Army and many of them receive no pay at all. They began by caring for refugees and victims of epidemics and starvation in Normandy, Belgium, Holland, and Rhineland, while the fighting was still going on; later they helped to repatriate displaced persons of Allied nationality in Germany. Later still some of them became free to give help to the German population, and additional teams arrived from England to supplement them. Supplies of course are limited, and are used primarily for children, sick people, and the aged. Wherever possible German organisations which understand local needs are asked to help with distribution.

In towns with a population over 5000 the education branch of Control Commission has arranged for school-children to receive a coupon-free midday meal; and supplementary feeding schemes for children under school age have been arranged by the relief teams. The Swedish Red Cross and the Swiss relief organisation known as Don Suisse are helping with this work. Swedish teams in the Ruhr have provided a daily hot meal for 120,000 children in the past six months, and Don Suisse

---

1. Have You Thought What Winter will be Like in Europe this Year? Issued by Save Europe Now, 14, Henrietta Street, London, W.C.2.
2. Reprinted from the *Tribune* of August 2.
3. Council of British Societies for Relief Abroad. Leaflet, September, 1946. 75, Victoria Street, London, S.W.1.

are feeding 30,000 children daily in eight towns of North Rhine and Westphalia. Holiday camps have been established for children and young people, and many thousands had a week in the open country or by the sea this summer.

Refugees streaming through the British zone from the east are adding to the heavy burden on the local administration of towns and villages. British and German voluntary societies, working side by side, help with billeting arrangements and personal difficulties, and arrange social and occupational activities for the young people.

Only about 500 British voluntary workers are engaged in these many tasks, a tiny force considering the enormous population needing help. The Council of British Societies for Relief Abroad (COBSRA), however, believe that though they can bring little physical help to those in distress their presence is a token of good will and an example of personal service which will help to restore morale. The COBSRA relief fund has raised £100,000; but the Friends Relief Service, operating not only in Germany but in France, Greece, Poland, and Austria, could use more than that in buying food, medical supplies, clothing, and blankets, over and above the £125,000 required for its regular work in the coming year. The Aid to Austria Appeal Committee needs £20,000 for food, and the Œcumenical Commission for Refugees, under the World Council of Churches, needs £10,000 for the purchase of drugs and medical supplies for Austria and Germany. The Save Europe Now Fund —sponsored by the Bishop of Chichester, Mr. Victor Gollancz (whose pamphlets have done much to make the misery in Europe generally known), Lord Lindsay of Birker, Prof. Gilbert Murray, and the Rev. Henry Carter—is appealing for £150,000 on behalf of these three bodies. The sponsors point out that supplies can be bought immediately, day by day as the money becomes available, so they appeal not only for maximum contributions but for a quick response: a little extra haste in responding may save lives which will otherwise be lost. Cheques should be made out to "Save Europe Now (European Relief Fund)" and sent to 14, Henrietta Street, Covent Garden, London, W.C.2.

FŒTAL RESPIRATION

WHETHER amniotic fluid is inhaled by the fœtus in utero is a controversial question which has been discussed at some length by Windle,[1] who investigated it experimentally in guineapigs. There are two main points at issue—whether the fœtus makes any spontaneous respiratory movements at all, and, if it does, whether these cause the entry of amniotic fluid into the lungs. From general inquiries into fœtal movements there seems no doubt that respiratory movements do occur from time to time in utero, but probably not continuously unless there is some special stimulus. The obvious stimulus is anoxæmia from embarrassment of the placental circulation, and when this is experimentally induced—as by constricting the umbilical cord—most mammalian fœtuses above a certain age respond by respiratory efforts. In investigating the onset and progress of organised movement in the sheep fœtus, Barcroft[2] employed tactile stimuli, the maternal uterus having been opened in a warm bath. The muscular response of the fœtus became more and more brisk and generalised between the 35th and the 50th days of pregnancy, but during the next 10 days inhibition from the higher centres appeared to gain ascendancy, the response becoming less general and the fœtus quiescent. In the phase of rising excitability, the response was more sustained and was rhythmic, being dominated apparently by the respiratory centre. The capacity for respiratory movements, therefore, develops early, but the response to asphyxia does not appear until inhibitory control of the musculature has set in; by this time the likelihood of spontaneous respiratory movements has greatly diminished. Owing to the difficulties of observing the fœtus, demonstrations of the inhalation of amniotic fluid have hitherto not been convincing.

Lately Davis and Potter[3] have introduced thorotrast into the amniotic cavity of human subjects. In twelve therapeutic abortions in which thorotrast was injected 17–48 hours before operation they found that the medium was invariably present in the lungs, while in four where it was administered only $^1/_2$–1 hour before operation it was absent. The X-ray findings were confirmed histologically. The significance of this experiment is increased by the observation that thorotrast failed, or almost failed, to penetrate the alimentary tract of the four control fœtuses, but penetrated that of all the others. In ten babies delivered by cæsarean section, thorotrast placed in the amniotic fluid 16–48 hours previously was definitely present in the lungs of half, and doubtfully present in the remainder. Although the control experiments included the three smallest fœtuses of the series, the results certainly suggest that aspiration of amniotic fluid may normally take place; but the extent and frequency are uncertain, and its physiological significance remains doubtful.

AN AMERICAN VIEW OF RHEUMATISM

ADDRESSING the Empire Rheumatism Council in London on Oct. 11, Dr. Loring T. Swaim (Boston), former president of the American Rheumatism Association, said that extensive surveys in the United States had shown that more than 1 in 6 of the population had some chronic disease. The commonest disorders were rheumatism, heart disease, arteriosclerosis and high blood-pressure, and asthma; and the most potent causes of disability, reckoned by lost work-days, were nervous and mental disorders, rheumatism, and heart disease.

Much has been done to improve the treatment of rheumatism by better teaching and by the activities of the American Rheumatism Association. In 1942 this association, in conjunction with the American Medical Association, produced a primer in which the rheumatic disorders were classified as (1) the frankly infectious, (2) the probably infectious (such as rheumatic fever and Still's disease), (3) degenerative joint disease (osteoarthritis), (4) arthritis due to physical trauma, and (5) disorders associated with disturbed metabolism (gout). The first aim, in Dr. Swaim's opinion, must be to improve general health. The patient should have at least six weeks' complete rest, if possible in hospital, where he is removed from the environment in which he has become ill and can be rested in splints under the care of physician and orthopædist. It is important that the general nutrition should be maintained, with special regard to vitamin deficiency. Small repeated transfusions may help the debilitated, and benefit may be derived from heat and sunlight, and the conservative removal of infective foci. The prevention of deformities is of paramount importance; the deformities of rheumatoid arthritis can, he held, mostly be prevented. Gold therapy, to which the American approach has hitherto been cautious, is now being more widely tried, but not in doses exceeding 50 mg. For Marie-Strümpell disease irradiation and the control of deformities has proved the most reliable treatment.

Dr. Swaim emphasised the importance of psychic factors, and particularly unsettled circumstances at home or at work. In his experience 70% of the onsets and exacerbations of rheumatoid arthritis are traceable to emotional disturbance, of which bad home relations are the commonest cause. Doctors must, he suggested, abandon their preoccupation with the treatment of disease, fascinating as this may be, and, to prevent chronic disease, take a closer interest in the way people live.

---

[1] Windle, W. F. The Physiology of the Fœtus, London, 1940.

[2] Barcroft, J. *Lancet*, 1942, ii, 117.

[3] Davis, M. E., Potter, E. L. *J. Amer. med. Ass.* 1946, 131, 1164.

CONTROL OF ICE-CREAM

MOST ice-cream manufacturers, and certainly those in a big way of business, are eager to satisfy the public-health authorities; and the neglect by others to ensure reasonable purity may often be due to ignorance of elementary hygiene rather than to carelessness of the consumer's fate. Be that as it may, much of the ice-cream sold today is potentially dangerous to the consumer, who is protected by no general sanctions empowering authorities to inspect ingredients and to supervise manufacture, packing, and storage.

Last week the Ministry of Health published new draft regulations for the heat treatment of ice-cream, which go some way towards filling this deficiency. Where a "complete cold-mix powder" is used, with which only water and colouring or flavouring agents have to be added, the powder is taken to be sterile from the heating it received in manufacture, and no further sterilisation is required, but the powder must be converted into ice-cream within an hour of reconstitution. Other mixtures must be heated to 150° F for 30 minutes, or 160° F for 10 minutes; within 1½ hours the temperature must be reduced below 45° F, and it must be kept so until frozen. If, after freezing, the temperature of any mixture should rise above 28° F it must be submitted or resubmitted to heat treatment.

This announcement drew a brisk rejoinder from the Ice Cream Alliance, which, according to the *News Chronicle*,[1] objects that, owing to the difficulty of obtaining suitable machinery, the regulations cannot be met by next May, when they are to come into operation. At a meeting of the Royal Sanitary Institute the view was that the regulations in themselves are admirable, and will eliminate the maker whose factory is the back bedroom and whose showroom is the street. But they do not go far enough. Plant for heat treatment should be fitted with an automatic recording thermometer, which alone can tell the visiting sanitary inspector whether the regulations are being followed. It should, moreover, not be too much to ask that all ice-cream be sold in closed cartons or wrappers. The regulations do nothing to dispose of the carrier, who may infect a mixture made from sterile powder which, under the regulations, is not resterilised. Tragedies such as that at Aberystwyth this summer will recur until there is some control of the personnel engaged in the handling of ice-cream. This can be attained only by rousing the social conscience with or without the support of the law.

ANTI-MIDGE CAMPAIGN

LAST year a subcommittee of eminent entomologists, under the chairmanship of Prof. F. A. E. Crew, F.R.S., set out to find the best way of using dimethyl phthalate (D.M.P.) to ward off the attacks of Scottish midges which were causing serious irritation among tourists and even the Scottish people themselves. An interim report[2] has now been published. Various ointments containing water were discarded as unsuitable owing to a tendency for the D.M.P. or the water, or both, to creep out. A good paste, however, was made (D.M.P. 15 g., kaolin 10 g., zinc oxide 1 g., soft paraffin 5 g.) which could be put up in collapsible tubes and carried in the pocket. But the most suitable preparation proved to be an emulsion (D.M.P. 100 c.cm., water 100 c.cm., 'Lanette wax' 5 g., triethanolamine 9 c.cm., oleic acid 27 c.cm.), which remained reasonably stable for several months. Preparations based on these formulæ have been on sale during the midge season just ended (July-September). Patch tests were performed, mainly on women forestry workers, and in most cases the application of D.M.P. to the skin caused only a slight tingling or burning for a minute or so, which passed off but returned, perhaps a couple of hours later, on washing the face. During washing, care must be taken that no D.M.P. gets into the eyes, and D.M.P. should not be applied to sunburns or soon after shaving; otherwise no adverse effects on the skin were observed. Field tests were made, with controls who did not use the repellent, and were eminently successful with the paste and emulsion already described, one application to exposed parts warding off attack for at least two hours. Preparations with only 35–40% of D.M.P. were not really effective, because the midges were not repelled but merely paralysed after landing and caused annoyance by crawling about on the skin. Experiments also proved that veils impregnated with D.M.P. were completely successful, whereas unimpregnated veils gave no protection.

The opportunity was taken of making a survey of Scottish midges, about which very little has been known hitherto. Fifteen species of culicoides were collected, of which three had not previously been recorded in Scotland. *C. impunctatus* constituted 76% of the midge population of the west of Scotland and was there responsible for 90% of over 800 bites. In nearly all the collections of *C. impunctatus* and of *C. obsoletus* the sex ratio was "very abnormal." For instance, Glasgow records gave only 4% males, and Dundee only 1%. But in a few collections of *C. impunctatus* the sexes were about equal in numbers. The significance of this fact is said to be obscure. In view of the probability that "the female of the species is more deadly than the male," in that she alone bites, the discrepancy may arise from the different methods of collectors, some collecting only from their attackers, others sweeping with nets the natural habitats of the midges.

CÆSAREAN SECTION

IF there is one operation for which by now the indications should be clear and the technique standardised, it must surely be cæsarean section. Yet anyone who cares to compare the figures in different maternity-hospital reports will find that this happy state has not been reached. Cæsarean section can be regarded in two lights according to temperament. The Tory performs the operation only when the indications are so clear as to leave him little choice. The Radical does the bulk of his obstetrical practice by the abdominal route; to him a cæsarean section is the master key to any obstetrical problem, real or imagined.

From the experience of three firms of surgeons over 14 years Waters[1] has tried to assess the indications for the operation. In 75,238 deliveries, cæsarean section was performed 2039 times. Waters objects to the term "elective cæsarean section," and asks who elects and on what foundation. There is, of course, no dispute about the need for the operation in the presence of obvious fœtal-pelvic disproportion, but only a small minority of cases of so-called disproportion fall into this class. Waters frankly admits that in borderline cases he cannot assess the potential capacity for moulding of the fœtal head, the extent of relaxation of the pelvic joints, and the power and efficiency of the uterine contractions. These are imponderables about which no clinician, however experienced, can prognosticate; and patients in the borderline group should be given a short test of labour, when it will be found that very few need a section. Waters finds that of the last 223 cardiac patients only 4·4% were submitted to section; the decision to operate was determined, even with decompensation, solely by strictly coincidental obstetric indications. Among the group loosely classified as antepartum hæmorrhage not due to placenta prævia, Waters maintains that cæsarean section has little place in mild cases but is important in the severe cases; by severe cases he implies extensive hæmorrhage with an undilated cervix and disruption of the myometrium by interstitial bleeding—so-called Couvelaire's uterus. His maternal mortality in 88 severe cases was 4% after cæsarean section and 5% from vaginal delivery. For pre-eclamptic and eclamptic toxæmias he never performs section until the eclampsia is controlled. Among 879 cases of mild pre-eclampsia section was done in 61; and among 117 cases of severe pre-eclampsia section was done in 26—a high proportion, but 11 had antepartum hæmorrhage, 4 had disproportion, and 11 had other complications as coincident indications for operation. There were 341 cases of placenta prævia, and section was performed in 104 with no maternal death; of the 237 patients delivered by the vaginal route, 2 died.

---

[1] Oct. 11, 1946.

[2] Department of Health for Scotland. Control of Midges. An Interim Report of a Subcommittee of the Scientific Advisory Committee. Edinburgh: H.M. Stationery Office. 1946. Pp. 11. 2*d*.

[1] Waters, E. G. *New Engl. J. Med.* 1946, 234, 849.

These indications largely coincide with those accepted in Britain. Some British obstetricians are more conservative and some more radical, but we are tending to become more conservative with the toxæmias and a little more radical with placenta prævia. In this country we do either a classical or a lower-segment operation. Of the 2039 sections in Waters's clinic, 121 were classical, with a mortality of 6·6%; 28 were cæsarean hysterectomy, with a mortality of 10·7%; and 1 was a vaginal hysterectomy. The remainder were some type of lower-segment operation; 1406 were transperitoneal, with a mortality of 0·92%, and 483 extraperitoneal, with a mortality of 1·03%. For these 483 a supravesical operation was employed in 290 and a Latzko operation in 193; mortality from the former was 0·6% and from the latter 1·5%. These are excellent figures, especially for the extraperitoneal methods, which have perhaps not been given a fair trial by British obstetricians. Patients dying after cæsarean section usually die from peritonitis. Waters's contention is that if the peritoneal cavity can be completely avoided these women are being delivered in the safest possible manner, and his figures bear out his contention. The extraperitoneal operation is anatomically fairly difficult but is nevertheless within the powers of any man competent to open the abdomen.

MEDICAL PRACTICE IN NEW ZEALAND

A YEAR or two ago Mr. Douglas Robb, writing as a New Zealand surgeon, suggested[1] that the peculiar scope and discipline of general practice ought to be recognised as a specialty, and receive like rewards and status with other specialties. But he also felt that economic considerations should be secondary: we should be seeking first the *bene esse* of the different branches of medicine. Thinking along the same lines, he has now written on the place of the hospital in medical affairs.[2] The emphasis on organic illness, he says, has attracted much of the total energy of the profession, most of which is released in hospitals; and the hospital is the only professional corporate effort to which a doctor or nurse can belong:

> "A hospital post thus means much more than its face value. It represents social and professional prestige, and constitutes one of the vested interests, struggled for by those who have it not, and clung to by those who have. . . ."

Students grow up with the belief that the hospital teaching staff are the only men worth emulating; and, with notable exceptions, think of general practice either as a necessary evil or merely as a short cut by which they can earn enough to do something more agreeable.

In New Zealand social security legislation has obscured these trends: the large sums to be earned in general practice and midwifery have led to the neglect of specialist practice and salaried posts. But the results, Mr. Robb considers, are not good, in terms of the quality of the service given. The fact that payment is made o the number of acts done has led doctors to do personall "many trivial things which ought to be done by a nurs or a secretary, but are not so done because if the docto does them they are worth 7*s*. 6*d*. each." Easy mone and high taxation tempt doctors to refuse night calls and the genuine medical emergency is often ill served Nor is there evidence, he thinks, that the high reward have encouraged doctors to combine for the benefit o the patient, or even to relieve each other; or that th preventive approach to medicine has been favoured Relative and absolute neglect of the specialist and the salaried officer have brought a retrograde tendency towards the combination of specialism with genera practice, to the detriment of both branches. Established specialists can of course earn a good living in private work, but the young specialist is "haunted by the fleshpots of general practice"; and salaried officers are so poorly paid that it is becoming hard to fill their ranks. Yet "any effort to raise the financial status of, say, an M.O.H. disturbs a swarm of other public officials." Again there are too few men to fill the higher teaching posts and the better rewards of private practice draw many of the abler men away; though, as Mr. Robb says, the professor should be the best man of all.

To restore the balance in the various branches of medicine, and to transfer the emphasis from cure to prevention, he would like to see a unifying plan, managed in each area or region by one authority, the health board, which would control the money available for health services, assign their proper duties to hospitals and health centres, see that they were properly equipped, and ensure that they did their work efficiently. Representatives of technical personnel on the board would be elected by their groups—doctors, nurses, and technicians; and a majority of five seats out of nine, or seven out of thirteen, should be given to representatives of the public. Such an arrangement, he thinks, would be better than a lay board with professional advisory committees, because it would put a direct responsibility on the profession to see that the public are well served. A believer in group practice, he would like to see general practitioners working in health centres under good conditions, with time for leisure and study, and opportunities to take a higher degree in their subject. Specialist practice, on the other hand, would be largely confined to the hospitals, where it can be supported by adequate services and equipment.

SALUTE FROM THE BOWLER

Lieut.-General Sir Alexander Hood, director-general of the Army Medical Services, was last Monday presented by war-time Army consultants, now demobilised, with an album containing the consultants' photographs and records, and a sum of money which is to be used for a prize. Sir Heneage Ogilvie, who as a major-general was consulting surgeon to the Army in Africa, said that the presentation was intended as a reminder of a happy association. The British soldier had received better medical attention from the service directed by General Hood than had any other fighting man in history. Sir Alexander, in expressing his thanks, emphasised the value of the consultants' work, mentioning in particular their help with the *Army Medical Department Bulletin*, the useful meetings between them and consultants of the Allied Armies and representatives of the Emergency Medical Service, the Medical Research Council, and other bodies, and their influence in raising the standard of medical practice overseas.

DR. C. S. MYERS, F.R.S., died at his Somerset home on Oct. 12, at the age of 73. The first president of the British Psychological Society, he was until his retirement director of the psychological laboratory at Cambridge University, and principal of the National Institute of Industrial Psychology.

---

[1] *N.Z. med. J.* 1944, 43, 248; see *Lancet*, 1945, i, 633.

[2] *N.Z. med. J.* 1946, 45, 183.

Parliament

THE BILL IN THE LORDS

Lord **JOWITT**, the Lord Chancellor, in moving the second reading of the National Health Service Bill on Oct. 8, said he was no iconoclast, but he did not doubt that our existing institutions must be modified and expanded to fit the new ideal of an integrated medical service. This was not a Bill to preserve ancient monuments.

Summarising the provisions of the Bill, he admitted that part v, dealing with the mental-health services, was obscure. But it was a temporary job and the Government hoped when time permits to review the legislation dealing with mental health. The language of the first clause, simple and curt as the Commandments, defined the greatest task ever placed upon the shoulders of any one man. If these duties were to be placed upon the Minister of Health he could not be denied the wide powers necessary to carry them out. According to the Bill the Minister would exercise these powers through regulations subject to the approval of Parliament, a method which would allow the administration to profit by experience.

THE MACHINERY

Our hospital system, he suggested, failed because it was not a system at all, and modern developments in medicine and surgery demanded more specialised organisations. Admission to a hospital was not enough; the patient must be admitted to the right hospital. Often where the need was greatest the resources were the least, and at present it was nobody's duty to see that hospital services were fairly distributed among the people. Whether we liked it or not, we could no longer run these services on the principle of "drop a shilling into my little tambourine." The proposals in the Bill for hospital administration, Lord Jowitt claimed, would provide an integrated system. The hospital management committees would act on behalf of the regional hospital boards, he hoped without undue interference from the boards, and, he was quite certain, without undue interference from the Minister. For services provided by local health authorities under the Bill reliance was placed, rightly he thought, on the larger units of local government. But the exact division of functions between the hospital side and the local-authority side obviously gave room for argument. For instance, tuberculosis and V.D. clinics had been placed on the hospital side of the line, though no doubt the hospital boards would make use of the health centres by agreement with the local health authority. The Bill expressly provided that the local authority need not themselves provide all these services. For home nursing or health visiting they could rely on existing voluntary organisations, such as the District Nursing Association.

For the general medical services new machinery had been set up to meet the doctors' unwillingness to be placed under the local authorities. No doctor would be compelled to enter the national scheme, but if he entered the scheme there must be two methods of control—the sale of practices was prohibited, and new entrants could not go to areas already fully covered and neglect areas which were not covered. A tribunal was also to be set up to investigate serious allegations against doctors. This machinery, the Government believed, would give full freedom, scope, and opportunity for the exercise of professional skill free from political factors or lay direction.

In paying the doctors the Government did not wish to rely solely on capitation fees; but while they wanted some element of salary they did not think that that should be the sole, or indeed the main, element. The Government would be foolish if they tried to construct this national health scheme on the basis of a disgruntled and dissatisfied profession, and for that reason they appointed the Spens Committee. They must try to arrange with the members of the profession themselves not only the range but also the method of remuneration, and the Minister, Lord Jowitt announced, was anxious to appoint a similar committee to deal with specialists' remuneration.

At every step the organisations in the scheme were interlocked, and its success would depend on the day-to-day coöperation of all the people working under it. He did not doubt that after this Bill had been threshed out all sections and classes of the community would sink their differences and press forward a great ideal for the betterment of the health of the people.

Party Criticisms

The Earl of **MUNSTER** asked whether it was merely for political and doctrinaire reasons that the whole of the medical profession were to be saddled with a system which they disliked, that institutions which the British people had so generously supported for centuries were to be removed from their control, and that fields in which local authorities had made much progress were to be taken over by the State. He did not believe that a single Government department could run a highly qualified and skilled service such as hospitals. Local administration might well require reform, but to transfer the whole hospital service to a single centre was to ensure that "wisdom at one entrance is quite shut out." For the Lord Chancellor to support such a proposal, he continued, as the confiscation of endowments for specific purposes must be unique in the history of trusteeship. Nothing could give less encouragement to the public to subscribe in future to any charitable enterprise. He did not believe that the Government could have done more to undermine the confidence of the medical practitioners, because the proposals for the general medical services offered no freedom of choice or movement, and little freedom of judgment, and pointed directly to the scheme becoming before long a full-time salaried service.

The Marquess of **READING**, speaking for the Liberal peers, supported the Bill in general terms, for, he pointed out, they had before them only the scenario of the ultimate Bill which would not have grown into its full splendour of technicolor for exhibition to adult and other audiences till 1948. The gaps would be filled by multitudinous regulations which would demand the closest scrutiny of both Houses. Of 74 clauses, 26 prescribed a regulation. He feared that before 1948 dawned not only the printing presses of the Stationery Office but the permanent officials of the Ministry of Health would be chronically overheated. Yet upon the good sense, good English, and foresight of these regulations the efficiency of the scheme would ultimately depend. He agreed that it was an anachronism that the health of the nation should continue to be left in the hands of voluntary organisations dependent upon charity. But he confessed that he found this rapacious engulfing of all the funds of the voluntary hospitals a considerable mouthful to swallow. Professional men were on the whole conservative—he did not mean politically Conservative, indeed from reading the papers lately he doubted whether anyone was politically Conservative any more—and some doctors were no doubt opposed to the scheme; but he hoped that discussions with the Minister would allay the fears raised by incautious utterances of some members of the Socialist party, and that the profession would lend itself with a good grace in the difficult circumstances at the outset to working the scheme, once satisfied that it was in the interests of the nation as a whole. He had a feeling that those who elected to reign in Hell rather than serve with Bevan would be few in number, secure in practice, and advanced in years.

The Archbishop of YORK, though impressed with the need for a national health service, feared that the Bill in its present form might undermine the independence of the medical profession. In these days when the State must own, control, and plan where once it only acted in a negative capacity, he attached great importance to preserving in the nation associations which had independence of their own. No doubt the Government's scheme made for efficiency, but sometimes efficiency could be bought at too great a price when it meant the loss of freedom.

Professional Criticisms

Lord MORAN, P.R.C.P., said that the surveys of the hospital service carried out during the war showed that drastic and expensive reorganisation was necessary. It was agreed that the money could only come from public funds, and that such expenditure must entail some measure of public control which could only be exercised by the Minister or the local authorities. The medical profession was in no doubt that it preferred the control of the Minister, and it was the removal of the dread that the hospitals might come under the control of the local authorities which had reconciled so many doctors to prefer the hospital provisions of the present Minister of Health to those of his predecessor. But there agreement ended. Many of his colleagues could not agree with the transfer of ownership of hospitals. They argued that the Minister should give the regional boards a block grant for distribution to the hospitals of the region, to be withheld from any hospital which did not put its house in order. But Lord Moran did not believe that any board, particularly one recently created, could thus apply sanctions to a powerful local authority, or that sanctions would be enough to bring about the drastic reorganisation which was essential. If, however, the medical profession felt that these hospital provisions were inevitable it did not mean that they were agreed that the particular provisions in this Bill would necessarily work.

The importance of the hospital service being a university service had, Lord Moran thought, received too little notice. Yet that was the original conception underlying the establishment of the regions. During the war specialists of every kind were sent by the teaching hospitals into the important hospitals in the region. They raised these hospitals almost to university standard. When they were called back at the end of the war he thought that doctors would agree that there was a sharp fall in the efficiency of hospitals at the periphery. In the past specialists had tended to congregate in the great centres. By a university service there could be a redistribution of specialists without duress, because men would willingly be seconded, feeling they were part of one great service.

If there was going to be this essential measure of centralisation in a scientific service, it was perhaps a paradox that there must also be a degree of decentralisation. The powers of the regional boards were but vaguely defined in the Bill. Suppose there was a complaint about dieting or nursing in a hospital, if the Ministry sent its own inspectors to investigate the complaint the board would lose authority. The Earl of Donoughmore had raised the point last April when nursing officers had been appointed who were to be the nursing authority in those regions. These officers would have the power to appoint and dismiss nurses. Were these officers going to exercise their powers through the regional boards, or independently of them? There was no guarantee that the Minister of Health would not interfere in clinical matters. That was not a fictitious vague fantasy; it had actually happened under the Emergency Medical Service during the war. The Minister must trust the regional boards, the hospitals, and the doctors to get on with their job.

THE DOCTOR'S LOT

Speaking of the doctors' fear that they would lose tl independence, Lord Moran agreed that if that happe the profession would indeed have received a mortal bl However effective the reformation of the health servi it would be of no avail if the conditions under wh doctors worked did not bring contentment and happin to them. Looking at this Bill, were these conditions s that the good type of man who had come into medic in the past would continue to enter it? In the innum able discussions on the Bill its effect on entry into t profession had hardly been mentioned. It was beca the Minister treated the teaching hospitals so sym thetically, and refused to blunt the growing edge medicine, that in the first instance many doctors examin the provisions of the Bill with sympathy. Those w worked in the academic world in medicine were perturb at present about the powers and composition of the boar that would govern the teaching hospitals. Medici in the past had been able to attract exceptional me Would it continue to do so? How were these gifted fe to be protected, and what did they want? First the B must be scanned to see that there was nothing in which encroached upon the leisure which the man ha given in the past to research. Leisure was going ou of the learned professions, to their detriment. Nowada the spare time of a specialist was taken up by attendan on committees, which were the drowsy syrup of tl democratic State. Many men with the greatest min were indifferent to material rewards, but it would b folly to handicap medicine in its competition with othe professions by a false parsimony. He had given notic to the Lord Chancellor that he would ask the Gover ment to appoint a committee on the lines of the Spe Committee to inquire into the remuneration of consultant and he was glad to hear that the Government had agree to that proposal.

At present the number of people seeking to ente medicine had leapt up, and though this was partly due t the effects of demobilisation Lord Moran thought i would continue, because in the past the entrants ha come from only a narrow section of the community many people being unable to afford the cost of training If the new entrants into medicine were to be subsidise by the State there must be new machinery for selection

Turning to the work of the general practitioner, Lor Moran pointed out that the present-day tendenc of patients who were gravely ill to seek institutiona treatment meant that the general practitioner saw a cas whisked out of his hands just when it became professionally interesting. The consultative service under this Bill would accentuate the difference between the general practitioner and the consultant. There was only one remedy. The general practitioner must be brought into the work of the hospital. Lord Moran confessed that he was less happy about the general-practitioner service planned in the Bill than about the hospital service, and that he was gravely disturbed by the fears of the general practitioners as to the future. They said they were against the abolition of the sale of practices, a measure of direction, and the basic salary. But all these came down to one fear—that there would be a whole-time medical service which would interfere with their liberty. He was certain that unless there was an adequate incentive to keep men on their toes, a whole-time service would be an incalculable disaster. In the unfortunate dispute that had arisen at the eleventh hour between the Ministry of Health and the panel practitioners Lord Moran was convinced that the doctors' claims were fair and just. But the dispute was not about terms but about procedure. The Minister wished to discuss the remuneration of panel practitioners at the same time as the remuneration of men in the future service, but the panel practitioners felt they had no mandate for this. Lord Moran was sure, however, that the Minister would meet the doctors' claims. It would be a disaster if the service were begun with some practitioners feeling that they had had a raw deal.

In medicine, Lord Moran ended, they always made a prognosis in a case feeling that they might be wrong. Men who knew the facts told him that if this service broke down it would be because there were not administrators to run it. If the Bill was to work something unusual must be done. He hoped the Minister would put into the service a small number of experienced men, trusted leaders of the profession, familiar with hospital work, who would give their whole time for about five years, to try to make the regions work. Many doctors working under the Ministry had not practised for 20 years. Men actively engaged in the profession were needed to come into the service. Only thus could the curtain be lifted which had fallen between the Ministry and the profession, leaving so much want of sympathy and understanding. Much of the criticism which the Bill had provoked seemed to him to be tethered to the earth; it had never become airborne, and it had been totally lacking in idealism. The politicians had made debating points and too many of the doctors had merely expressed their fears and prejudices. It had been left to the Minister to generate the momentum that overcame obstacles and to enlist the strenuous support of ardent minds. When it became law Lord Moran believed that despite all past differences the whole medical profession would unite to try to make the service a success.

Lord TEVIOT, speaking as chairman of the interdepartmental committee which had inquired into the condition of the teeth of the nation, described the need of the public for dental improvement as gigantic. The annual intake into the dental profession would have to be increased from 300 to 900.

Lord INMAN pointed out that today the voluntary hospitals were only partially voluntary; last year 45% of the income of Charing Cross Hospital came from public authorities and patients' payments. In a modern community, he believed, the heavy cost of curative and preventive treatment, of buildings and equipment, made financial demands which it was not within the power of voluntary effort to satisfy. This Bill would continue and expand the work of the hospitals, building on their tradition and experience a firm and worthy edifice of which this country would be proud in years to come.

PROPOSED AMENDMENTS

Lord HORDER, F.R.C.P., affirmed that the medical profession were not obstructionists. For the last 20 years they had done their utmost to persuade the powers-that-be to get a move on in integrating the medical services of the country. But the doctors had hoped that it would be through the more natural process of evolution rather than through the present method of revolution. The doctors thought they could have attained more certain benefits with less risk. They believed that they could have rationalised the hospitals without transferring their ownership to the State, covered the health of the dependents of the workers, set up health centres without sacrificing the doctors' liberty, and brought together in a comprehensive whole the industrial medical service and the medical services of the various Government departments. He agreed that this Bill enhanced one desirable thing—the availability of medicine to the citizen. But too much might be paid for that advantage, and it would be a loss to society if through this Bill medicine became stereotyped.

The ideal to be aimed at in framing a national medical service policy was not this terrific centralisation of power in one man, but a maximum of central direction and a minimum of central control. Closer contact with the medical profession during the framing of the Bill would have safeguarded Mr. Bevan and his successors from this danger. The Minister had spoken many times about his "consultation" with the profession, but that had been a euphemism for the most blatant form of *ipse dixit*-ism.

As soon as their Lordships had dealt with the Bill the doctors would be asked by a plebiscite issued by the British Medical Association if they would work the Bill. The answer to the plebiscite might even at this late hour be influenced by what happened during the committee stage in their Lordships' House, because Lord Horder hoped that the Government would sympathetically consider certain amendments to preserve the autonomy of the voluntary hospital, and to safeguard the freedom of the doctors. This Bill went far towards nationalising medicine. Whatever natural talent a doctor had, however ambitious he might be, he was condemned to a dead level of mediocrity. Not only his economic position but also his professional status and prestige had been given a ceiling. Unlike his fellow civil servants of the future, he was to have no chance of promotion. Lord Horder saw no escape from this state of affairs except through the medium of a black-market in doctoring, and his mind boggled at the thought of its probable immensity.

The Minister said it was not possible to insert the terms of remuneration in the Bill, but it should be possible to amend an existing clause so that the method of payment was stated, and this should be the capitation method unless, in the opinion of the executive council in whose area the services were rendered, a different basis was considered necessary. The prohibition placed on the selling of practices, the power of negative direction, and the refusal to allow a doctor charged with some offence under the Bill the right of appeal to the High Court, were surely matters that required amendment. Doctors thought that the standing advisory committees of the Central Health Services Council should be appointed by and take their references from the council, and that they should report through the council to the Minister. They also considered that the Minister should sacrifice his power to vary the proportion of medical and lay representatives on the local executive councils. To retain local interest, hospital management committees, acting for a group of hospitals, should appoint a house-committee in each hospital, subject to the hospital management committee and the regional board. It should also be one of the functions of the hospital management committee, or of the house-committee, to set up a medical staff committee with the right to nominate a reasonable number of its members to the hospital management committee or house-committee. On the side of medical education, the Bill also needed amendment, for it laid on the boards of governors of teaching hospitals no duties to further medical education and research. It was a glaring anomaly that gifts and legacies received by the non-teaching hospitals between the passing of the Act and the appointed day would go direct to the Hospitals Endowment Fund; whereas any gifts and legacies received after the appointed day would be retained by the management committee. We were about to embark on a great experiment, Lord Horder concluded, and it was the doctor's duty to do his utmost to make it succeed. If he could fulfil his paramount duty to his patients through these means he would; if not it would be for the patient to decide how long the sacrifice of efficiency should continue.

CHRONIC DISEASE

In a maiden speech Lord AMULREE, F.R.C.P., spoke of the condition of the chronic sick today. The transfer of the municipal hospitals to the central authority under the Bill would, he thought, benefit these people enormously. In 1944 there were about 60,000 of these patients in the whole country, of whom at least a third were under sixty-five. In some of the smaller institutions conditions were deplorable and no attempt had been made to classify the patients. Yet with a proper approach much could be done for them. In one big institution of which he knew, about 60% of the patients who came into the chronic sick ward were discharged into their own homes or into hostels for old people. When the Bill was passed he hoped the chronic sick would share the same medical staff as the acute sick. It was difficult to separate elderly people into the healthy and the sick, for when people grow old there was a narrow borderline between sickness and health, and there should be a simple and easy flow to and from hospital. Lord Amulree suggested therefore that sick and healthy old people should all come under the same authority.

The Second Day

The Earl of **Listowel** opened the second day of the debate by replying to some of the points raised. It was a misunderstanding, he said, to suggest that the Bill proposed that the Ministry of Health should run the hospitals. The Minister must—not may it should be noted—delegate his powers to the regional hospital boards, and from there to hospital management committees or, in the case of teaching hospitals, to boards of governors. The regional boards would not interfere in the affairs of these committees in the daily routine business of the hospitals. Their job was to supervise and plan for the region as a whole. There would be no financial leading strings, for each hospital committee would be free to decide how its money should be spent within the limits of the annual budget. The investigation of complaints and the engagement or dismissal of nursing staff would be delegated to the regions, and there was no real danger of Whitehall interfering in the domestic affairs of the hospitals.

The size of the regions had not yet been decided, but each would, so far as possible, centre upon a university; and after consultation with the interested parties the Minister would define the regions under regulations to be submitted to Parliament. Lord Listowel categorically denied that the Government policy was to institute a full-time salaried medical service, and he promised that when an allocation was made from the Hospital Endowments Fund the wishes of the donors would not be forgotten.

The Minister was anxious to break the deadlock that had arisen between the Ministry and the panel practitioners, and Lord Listowel announced that a meeting between Mr. Bevan and representatives of the profession would take place on Oct. 10. They were not dispensing, he added, with material or moral incentives to an efficient medical service, and there would continue to be a graduated scale of salaries in the hospital service and progressive remunerations for general practitioners.

By wider education and mass publicity campaigns it was hoped that the rising generation would grow up physically as well as mentally literate, and sufficiently sensible not to regard good health as merely a state of not being ill. The Bill was not the product of any single party or Government. It was the outcome of concerted effort over many years, involving doctors, laymen, and Governments, to improve the efficiency of our medical services and to make them more easily accessible to the public. A typically British scheme, it strove to incorporate in the new structure all the serviceable elements of proved usefulness in the old. If it moved a bit further in the direction of State medicine it still combined freedom, for doctors and patients alike, with overall planning, private with public practice, and unpaid voluntary service with salaried contractual obligations. It was as far from the all-embracing State system of medicine practised in Russia as it was from the commercial medicine favoured by the United States of America. By its inclusiveness, its more even distribution of the nation's medical resources, and most of all by breaking the cash nexus between medicine and the individual, the Bill would remove the gravest obstacle to equality of opportunity.

TO BE CONSIDERED IN COMMITTEE

Lord **Lyle** feared that even with amendments it would be impossible to make what was fundamentally a bad Bill into a good Bill. He regretted that a nation which had vanquished totalitarianism should propose to enslave its medical profession. Under the Bill the Ministry of Health would obtain dictatorial powers affecting the intimate lives and health of every single man and woman in the country. Lord **Beveridge** on the other hand thought it was a good Bill well worth making better by amendment. For the first time it set up a true Ministry of Health with the duty and power of attacking disease as a national enemy. Health as well as bread for everybody, he asserted, should come before cakes and circuses.

Lord **Uvedale**, F.R.C.S., in a maiden speech suggested that in an efficient medical service it was essential that every patient should be free from financial anxiety, and have a free choice of hospital and doctor. Admitted to hospital, he should find himself in pleasant sympathetic surroundings and free from unnecessary and irksome restrictions, for in sickness every man and woman was an individualist. It was also essential that the doctor should have independence in medical treatment, adequate equipment, and ancillary help. Remuneration must be sufficient to attract able men and women, and there must be opportunities for the gifted to attain positions of influence and distinction in the national life. Finally the medical profession must be controlled by the medical profession.

Lord **Luke** was disturbed by the hesitancy people were showing at present in subscribing to hospitals, and appealed to the Minister to evolve a formula for this interim period to prevent generous habits being broken. Lord **Addington**, speaking as a vice-president of the Association of Municipal Corporations, was distressed that the non-county boroughs should lose their maternity, child-welfare, and other health services. He would like provision made enabling the county councils to delegate their public-health functions to the non-county boroughs which had performed them efficiently. He felt that the local health authorities should be able to nominate their own representatives to the regional hospital boards, hospital management committees, boards of governors of teaching hospitals, and the central council. Lord **Llewellin** felt that the equalisation of the voluntary hospital endowments was not worth while in view of the difficulties it would create.

Lord **Jowitt**, in summing up, said he would not go through the detailed points, for they would be dealt with in committee. He promised careful consideration for their Lordships' amendments, but pointed out that great care had been taken in preparing the Bill and that the Minister had already made considerable concessions in another place. He agreed that doctors would much dislike to become salaried civil servants, and he reiterated that the Government had no such intention. If such a thing were done, he pointed out, it would have to be by a regulation which must be submitted to Parliament. In three respects the Government were accused of enslaving the doctors—by payment of part of their remuneration as salary, by negative direction, and by prohibition of the sale of practices. Taking a comparison from his own profession, Lord Jowitt asked if our full-time salaried judges were enslaved. County-court judges were even directed to certain regions. Were they enslaved?

He wished to underline everything that had been said about decentralisation. The nursing inspectors who had been appointed, for instance, were not inspectors in the ordinary sense. Their function was to go round to the matrons of the various hospitals to try to help them to get staff. Turning to hospital endowments he reminded their Lordships that if he were accused of taking sixpence out of the till he was putting a shilling on the counter, for he was giving from public funds far more than he was taking. When the Minister came to reallocate the funds he would consider whether a particular bequest was obviously for some local purpose. If so it might be treated differently from a bequest which was quite general.

The Bill was read a second time and committed to a committee of the whole House.

QUESTION TIME

Family Allowances

Mr. JAMES GRIFFITHS, Minister of National Insurance, in reply to questions, said he recognised that there had been some disappointment among those in receipt of payments under one or other of the existing social services which already include additions for children, because they have not continued to receive those additions over and above the new family allowances. It had, however, throughout been made clear that so far as existing schemes of social provision for risks arising in civil life provided specifically for children, payments under the Family Allowances Act would be in substitution for or would be taken into account in determining the amount of the additions made for children under other schemes. In the present transitional period improvements in one direction had been made in advance of others which would substantially benefit many of those now affected and would be brought in later under legislation already passed or to be passed. It was the Government's aim to build up the various schemes of social provision as a coördinated whole, and the place of family allowances in them must be looked at in relation not only to existing schemes but also to schemes still to be brought into force. The Government are examining the whole position from this point of view.

In answer to a further question, Mr. T. STEELE stated that, in accordance with the provisions of the Family Allowances Act, family allowances of 5s. were being substituted for children's allowances of 3s. for the second and subsequent children of widows under the Contributory Pensions Acts in about 35,000 cases.

Shortage of Medical Textbooks

Sir E. GRAHAM LITTLE asked the President of the Board of Trade if he was aware that the shortage of medical textbooks was a handicap to medical education, that many of the standard books in use by medical students were unprocurable, and that students and practitioners ordering them had been waiting nine months for delivery; and if he would take steps to remedy this position.—Sir STAFFORD CRIPPS replied: The main factors limiting the production of medical and other textbooks, for which there are increasing and accumulated demands, is the shortage of labour and of paper. The numbers employed in the printing and book-binding trades were still well below the pre-war strength, although the labour force increased, in July, 1946, to 74% of its pre-war figure. Publishers' regular paper quotas had been substantially increased over the last 18 months—from $42^1/_2$% to 60% of pre-war usage. In addition, it was open to any publisher who cannot bring out an important textbook merely from lack of paper to apply for a special allocation for that purpose.

Flour Extraction

Sir E. GRAHAM-LITTLE asked the Minister of Food if he would name the medical adviser mentioned in the secret instruction to Controlled Millers, C.M.C. 646, dated Sept. 19, 1946, as advising the reduction of extraction in national flour from the current 90% to 85%; why, in the same instruction, millers were informed that they must maintain the quota of chalk 14 oz. to 280 lb. in view of the explanation offered by his department that the quota had been doubled to meet the increased extraction of 90%; and whether he would decrease this quota of chalk pari passu with the decrease in the rate of extraction.—Mr. JOHN STRACHEY replied: The medical advisers mentioned in the instruction are the members of the Interdepartmental Standing Committee on Medical and Nutritional Problems. The original recommendation was that 14 oz. of creta præparata should be added to each sack of 280 lb. of 85% extraction flour, but in practice only 7 oz. was added. When the extraction-rate was raised to 90% the addition of creta præparata was raised to 14 oz. per 280 lb. on the grounds of the increased amount of phytic acid in the flour. Now the extraction-rate was being lowered to 85% it was considered inadvisable to lower the rate of addition of creta præparata below the original recommendation as alternative sources of calcium in the diet are short at present, but this course was subject to any further recommendation from the medical advisers.

Saving through Bread-rationing

Replying to a question, Mr. STRACHEY said that the saving in flour achieved by bread-rationing appeared to be about 214,000 tons so far, but he hardly thought that saving would continue at so high a rate.

Medicine and the Law

Alleged Cruelty to Cats

Dr. E. G. T. Liddell, Waynflete professor of physiology at Oxford, did not succeed in his appeal against the magistrates' decision convicting him of causing unnecessary suffering to cats kept by him in the animal-house of the university department of physiology. Quarter sessions, however, after a patient re-hearing which lasted nearly three days, reached findings which went far to justify his appeal. The fine of £25, imposed on him in the magistrates' court, was reduced to £5. The appeal of Mrs. Scragg, the woman who had charge of the cats and who had been fined £5, was allowed.

The allegations of cruelty were indicated in our account of the proceedings before the magistrates (*Lancet*, July 13, p. 61). Dr. Liddell, it may be recalled, was conducting research into the treatment of distemper in cats by sulphamethazine. At the recent quarter sessions the learned recorder held that Dr. Liddell had committed an error of judgment in putting too many cats into the enclosure while they were suffering from distemper. Apart from this overcrowding, said the recorder, Dr. Liddell had acted in a humane and proper manner; he had performed no cruel experiments; his treatment of the animals was a non-painful experiment, designed to cure the disease; none of the allegations against him, except the overcrowding, was proved.

The prosecution was undertaken by the Royal Society for the Prevention of Cruelty to Animals, whose inspectors gave evidence of what they saw when they visited the cats' compound. The recorder made the comment that he thought the witnesses for the society were entirely honest, but they were upset by the sight of this very distressing distemper "and failed, in my judgment, to distinguish between the natural symptoms of distemper, which it was impossible to cure while the disease was raging, and the further aspects of the disease."

An accusation of bad faith, made against Dr. Liddell, was satisfactorily disposed of. The prosecuting counsel had declared that Dr. Liddell was not conducting any experiment upon the cats and that his claim to have done so was an afterthought. The recorder said he accepted the evidence of Dr. Liddell and Mrs. Scragg in its entirety; "Dr. Liddell was conducting experiments on these cats and I accept his evidence entirely on that." There seems indeed to have been an element of exaggeration in the allegations. It was put in cross-examination to one of the society's witnesses that, out of eleven cats which, at the hearing before the magistrates, he had said would have to be destroyed, eight had since recovered. Sir Howard Florey, F.R.S., called on behalf of Dr. Liddell, observed at one point of his evidence that a lot of nonsense was talked by people who transferred human feelings to cats—a remark which involved him in an inconclusive argument with the society's counsel. The recorder put the matter more cautiously when, in deciding the case, he began by stating the opinion that charges of offences against animals often led to "public emotion" and to a certain "lack of judgment."

In England Now

A Running Commentary by Peripatetic Correspondents

THE other week I visited a recovery home for boys which was run, for no obvious reason, on ship's routine. Like all such things it was more naval than the Navy. Lads running up to my guide and asking "Permission to go ashore, sir?" took me back to previous years with a jolt. But it was a form of play-acting that appealed greatly to the boys and could be developed into a handy way of getting them to carry out the routine laid down for their recovery. When, however, it came to the doctor's pennant that was hoisted whenever a doctor came aboard I was out of my depth, my naval duties having always been on the dry side of high-water mark. The final ceremony, however, designed to promote His Majesty's good health, was in the true naval style and left all concerned in a happy frame of mind.

Why is it that some convalescent homes manage to make their inmates enjoy their stay while others just fail? At one institution, run by a religious order to provide convalescent women with a month at the seaside, the sister-in-charge seemed to be responsible for the happy atmosphere. Those who have never encountered religious sisterhoods expect a sister to be rather a remote other-worldly sort of being, but this one altered the visitor's ideas literally in the twinkling of an eye, for she certainly had a twinkle in hers. "You see," she explained, "I am lucky. This place was closed during the war, so I could start afresh and forget tradition. I don't have any rules—why should I? The patients are reasonable people who come here to rest. So I let them. I expect them to be in time for meals and not to sit up late talking—that's only normal good manners and they see the reason for it. Reading in bed? Well, I know they ought not to really, but nor ought I for that matter, and I do so like doing it. So I can't very well stop them." For all her light-hearted air she must have had many troubles in managing such a home in these days of rations, controls, and shortage of domestic staff. But she managed to look as though she hadn't a care in the world.

Then there was that other home, spotlessly clean, where a dozen women were taking a much-needed rest. Two elderly ladies were taking their elevenses in a peaceful sunny room. One of them, seeing a man being shown round, suspected (wrongly!) that he might be a prospective donor and took the opportunity to make a little speech, prefaced by a charming formal bob, saying how happy she had been there. She had never been away before and had come in some doubt and apprehension, but she had enjoyed herself immensely and was sorry to be going next day. "It's the Christian atmosphere that counts, sir," and with another bob sat down again. Here there was no question of a religious order and the atmosphere must have been the result of the unselfish labours of a small committee of local people with their hearts in the right place. There could be no question of a M.B.E. arriving, let alone a title. The work was its own reward. This must have a good deal to do with the secret. The weight of the work rests on voluntary workers who, I suppose, can be taken as the spiritual descendants of the religious orders of medieval days, so that we get back to a common ancestry for the inspiration of both institutions.

Since the dissolution of the monasteries such people have always worked in small and highly individualistic units. How will they fit into a large and tidy organisation such as is now projected? True, the religious orders were once the largest administrative units in the civilised world, but can the secret of organising such people in large units be recaptured, or will they always have to work on the fringe of the State's domain? For work they will.

* * *

The deadly nightshade seems to be commoner than usual this year. Have many cases of poisoning been seen? I am always surprised that people do die from eating these berries, for they do not taste at all pleasant, and a careful exploratory lick would reveal this without doing much harm. Unfortunately, some children will devour handfuls of a berry they have discovered in the hedge regardless of how it tastes, though at home the same children may be particularly finicky about their food.

The detective story in which the victim fell dead after one taste of a nightshade berry put among h fruit is as inaccurate as most accounts of sudden deat by poison. Cyanide is no doubt a pretty deadly substance, but in fact it is much slower than in fiction. I some metabolic experiments I had to kill some frog instantaneously to isolate certain normal substance from the tissues. When KON solution was squirted int their mouths they pulled a wry face, spat it out, hoppe off, and survived quite happily. An injection into th peritoneum caused death in about five minutes. The died in under a minute when it was injected intravenously. But it was quite different from the rich uncl who suddenly slumps into his chair in the library, and th detective notices "the pungent smell of bitter almonds."

* * *

A physician to a teaching hospital has only too many opportunities of appreciating the platitudinous observation that an old dog finds it difficult to learn new tricks And, with more or less justified self-pity, I have often when taking stock, considered what proportion of one's knowledge is in fact employed in the actual practice of one's professional life and what proportion represents a concession to the demands of the curriculum and the various examining boards. Such a reflection supplies an easy transition to a comparison between ourselves and the practitioners of our great sister profession. It will be recalled that, after twelve years' retirement from his practice at the Bar to devote himself to national service, Lord Simon returned to preside over a Court of Appeal in his capacity of Lord Chancellor. And, notwithstanding the interval, the great lawyer recommenced his legal activity in full flood. Instantaneously the cogs meshed; the intellectual machine resumed its work without friction. Suppose our profession to possess the analogous office. We are reminded in *Iolanthe* that the Lord Chancellor embodies the law. To suggest that after twelve years' retirement the Lord Physician or Surgeon could embody medicine or surgery would be too ridiculous for even momentary consideration.

The law, I take it, is very nearly static. Its basic principles remain unchanged; any alterations or accretions which result from newly established precedents are in substance comparatively trivial. The possession of judgment; the capacity of persuasive advocacy; the ability to present facts and arguments with clarity and conviction, in part natural talents, in part the result of practice and experience, are not necessarily prejudiced by a period of inactivity even as long as twelve years. But the art of the doctor is one of continuous progress. Admittedly, basic principles remain for all time, but the acceptance of discoveries and innovations is essential in the daily practice of any physician or surgeon. The physician who returned to practice after twelve years' absence would for a time be as puzzled as if he were transported to a strange land of people speaking a foreign tongue. He would be confronted with the names of "new diseases" which, though they must have existed in his day, had never been recognised. He would find that certain conditions which he had accepted as ætiologically obscure and incurable were being rapidly and completely relieved and sometimes even cured. Diabetes by insulin for example; addisonian anæmia by liver; myasthenia gravis by 'Prostigmin.' A vast therapeutic field presents itself under chemotherapy; another by the introduction of sex-hormones. Vitamins which occupied a few lines in the textbooks of his day, have now acquired a vast bibliography. At first he would be more ignorant and feel more helpless than a first-year student; or, to resume analogy with the other profession, a very young gentleman who has started to eat his dinners.

To what extent would adjustment be possible? Would he in time become again the great man of the day? I doubt it. For one thing, the influence of experience would compel a timid if prudent reluctance to accept all these panaceas, since experience recalls the precocious confidence in the value of so many cures which had failed in the test of time. Yes, the old dog learns new tricks with difficulty.

And so I turn with a sigh to master the principles of the rhesus-factor on which I am to lecture tomorrow. For even though by sedulous application I may grasp sufficient for this temporary purpose, I am most unlikely ever to carry its application into practice.

Letters to the Editor

ROYAL COLLEGE OF PHYSICIANS OF LONDON

SIR,—Certain members of the college have written to e medical journals about the representation of members the counsels of the college. They must know that e President took the initiative in calling a meeting of embers of the college in January. This was attended y three hundred members and a committee was ppointed to go into the matter. This committee eported to another meeting in April and their recommendations were accepted practically unanimously. The resident thereupon brought the matter before the ouncil of the college, who made recommendations to the omitia which involved alterations in the by-laws of he college, and this was put in hand at once. There s no reason to believe that the great majority of members re not satisfied with the procedure adopted.

A few members criticised the method of election of ellows but did not receive substantial support.

Royal College of Physicians,
London, S.W.1.

H. E. A. BOLDERO
Registrar.

CHILDREN WHO SPEND TOO LONG IN BED

SIR,—May I thank Dr. J. A. McCluskie for his most helpful article in your issue of August 31? In my three children, ranging in age from 6 years to 2 years, I have noticed many improvements since I cut down their sleep to the times he recommended.

I do not understand the difficulties of Dr. Catherine Storr (Sept. 7, p. 363), as the management of differing hours of sleep is just part of the household routine which must be followed if all the work is to be done; an understanding husband is of the greatest help in this connexion. Admittedly I have no small baby, but I have no help with the housework. I feel that when we have our next baby I shall be very glad of the guidance given by Dr. McCluskie in the difficult matter of infant sleep.

It is small wonder that the child propped in the pram, his toys around him, should go to sleep; he does so from sheer boredom. I have always left my infants (quite happy) in the playpen to play, even when they could only lie and kick.

It seems very surprising that a woman as busy as the one described by Dr. Storr should find time to stay in bed after 6 A.M. or have an afternoon rest. Perhaps Dr. McCluskie could give us some guidance on adult sleep requirements.

Pinner. BETTY AINSWORTH.

BOVINE PLASMA AGAIN

SIR,—There is a tendency to regard experiments done on the production of new blood-plasma substitutes as acts of supererogation, although it is conceded that such substitutes may be means of avoiding hepatitis and, less important, of relieving blood-donors of their heavy responsibility. I have long felt that a more favourable attitude is imperative, and anyone who has worked abroad among people who have an atavistic dislike to giving blood will agree. A dramatic presentation of the exsanguinated air-raid casualty will produce volunteer donors, but the equally pitiful case of a cholera patient raises different emotions. An efficient blood-plasma substitute which could be stored without refrigeration in outstation dispensaries and given with the same technique as a hypertonic saline would be one of the greatest blessings science could confer on doctors called on to deal with epidemic cholera or dysentery. The argument applies with equal force to the treatment of surgical and medical emergencies and the protracted treatment of nutritional hypoproteinæmias, biliary cirrhosis, &c.

Your annotation of Sept. 7, evoked by Dr. Massons's article in the same issue, gives certain criteria for assessing the suitability of plasma substitutes—i.e., non-antigenic, non-toxic, free from agglutinins (and hæmolysins), and of an osmotic pressure comparable with human plasma. To these I would add an extension of the criterion "non-toxic" and one further criterion.

The new criterion (making no claim for originality) is that the substitute is capable of being metabolised with profit by the patient. Obviously gum acacia, cellulose derivatives, and colloidal products of polymerised organic substances are excluded under this additional rule; but so is gelatin, which may still act very efficiently, in producing prolonged hæmodilution, but which is not metabolised (except perhaps when given with a mixture of amino-acids to make up for its constitutional deficiencies) and is in fact excreted in the urine almost cent. per cent. within 24 hours. Dr. Massons does not give data which would enable judgment to be passed from this point of view on his preparation of calf plasma. True he says that the results in the treatment of certain hypoproteinæmic conditions were as good as with human blood plasma, but American investigations have shown that it is extremely difficult to alter the plasma-protein concentration in such states by the administration of human plasma, so the only evidence, apart from the diuretic effects (which could equally well be produced by gum acacia), that true "profitable" metabolisation of the product occurs would be on the basis of nitrogen-balance experiments. This is a request for information and not carping criticism.

The extension of the criterion "non-toxic," possibly implied though not specified in the annotation, is that the substitute should not produce the syndrome which follows the use of macro-molecular substances such as gum acacia or even gelatin, which includes depression of plasma-protein production and prothrombin, an increase in the E.S.R., and a greater or less degree of blocking of the reticulo-endothelial system. Such an effect with colloidal solutions is to be expected unless the substance is metabolised, and each item in the syndrome can be of clinical importance, although these might justifiably be ignored when the infusion is not to be repeated, as in cases of surgical emergency. Cholera in a patient on the verge of, or actually in, a state of nutritional hypoproteinæmia presents such a condition where a further depression of plasma-protein production might just tip the scale between survival with rapid convalescence and death or a protracted convalescence. With salines only, such patients can die with a depressed blood-volume (dehydration) and simultaneous tissue or pulmonary œdema, and only human plasma or serum, or a metabolisable protein substitute, can be useful therapeutically.

Your comment that the osmotic pressure of such a preparation as Dr. Massons has described is probably less than that of human plasma is almost certainly erroneous. The denaturation increases the osmotic tension in this preparation to the extent of about 15% of the *total* osmotic tension of the original plasma, and the increase will be almost entirely due to a rise in the colloid osmotic tension. The probability is that the colloid osmotic tension of the preparation is well above that of human plasma. In any case, within wide limits determined largely by the amount of electrolytes introduced with the colloid, the actual colloid osmotic tension matters little.

Impressed by the great need for an easily available plasma substitute I have made several series of experiments under difficulties. In the first Colonel L. A. P. Anderson, I.M.S., then director of the Pasteur Institute, Shillong, and later director of the transfusion services, G.H.Q., Delhi, prepared bovine serum to which had been added 8·5% glucose and which was then spray-dried. This product was non-antigenic and non-toxic to guinea-pigs and could be sterilised by boiling. However, large-scale spray-drying was then impossible.

Later, after the publication of Edwards's article on "despeciated bovine serum," I started experimenting again and finally decided on egg-white as the protein basis because the whole process could be carried out easily and aseptically, the globulin could be precipitated by dilution with distilled water, and the complications of removing clot and corpuscles did not arise. This preparation was apparently non-antigenic and non-toxic and had quite phenomenal diuretic effects on patients with famine œdema when given as an approximately 5% solution in normal saline 300 c.cm. The criterion I insist on was not then applied for lack of facilities to work out a metabolic balance; neither was any estimate made of the effect of despeciation on the avidin (antibiotin complex).

An egg shortage and more work brought this experiment to an end! Although it sounds more bizarre even than bovine plasma, the application of denaturation to egg-white albumin might well be worth further study—a thing which I will certainly do unless someone better qualified and with better facilities does it first.

I am extremely glad that Dr. Massons has given us the details of his procedure and investigations into the properties of denatured calf plasma, and I hope that he will publish soon the metabolic studies complementary to its use in hypoproteinæmic states.

Brixham, Devon. R. Arthur Hughes.

TUBERCULOUS GLANDS AND CALCIFEROL

Sir,—In his letter of Sept. 28 (p. 473) Dr. Wallace writes that treatment of tuberculous glands with calciferol seems "helpful when sinus formation is present" but that it "has a clinically adverse effect on glands which have not broken down." He admits that this is "little more than an impression." I should like to record that in three cases of tuberculous cervical adenitis of the multiple type, without sinus formation, quite unsuitable for treatment by radical excision, there has been a markedly favourable response to calciferol, resulting in a reduction in size of the masses in the neck sufficient to excite pleased comment from the three patients concerned. It would be ridiculous to draw any conclusions from this. My sole purpose is to register an "impression" quite different from that of Dr. Wallace.

Dr. Wallace is right when he advises that calciferol should be given with caution when pulmonary tuberculosis is present, at any rate until more is known about its effect on this condition. On the theory that the beneficial effect of calciferol on lupus might be due to a specific effect on squamous epithelium I treated four cases of tuberculous laryngitis accompanying pulmonary tuberculosis by the administration of 100,000 to 150,000 units of calciferol daily. This treatment had to be abandoned after 5 days owing to undesirable toxic effects.

Though Dowling and Prosser Thomas[1] declare that the effect of calciferol on lupus does not seem to be related either to symptoms of toxicity or to the serum-calcium level, this point obviously requires further elucidation. Clinically, this might be done by treating a series of cases with parathyroid extract and large doses of calcium or by other measures designed to keep the serum-calcium at an abnormally high level.

Best and Taylor[2] point out that the overdosage effects of parathyroid and irradiated ergosterol are similar. Both cause the same degree of hypercalcæmia, hyperphosphatæmia, and a rise in the non-protein nitrogen of the blood. The symptoms during life and the post-mortem findings after poisoning with either material are identical.

A comparison of series of cases treated by the two methods might shed important light on the mechanism by which calciferol produces its effect on lupus lesions.

Neath, Glamorgan. T. Francis Jarman.

CONTRACEPTION WITH THE SILVER RING

Sir,—The medical committee feels that a warning should be given concerning the sudden revival of a method of contraception called the silver or Grafenberg ring.

This appliance consists of a small ring, composed of silver, platinum, or other metal, which is inserted into the uterine cavity, where its presence, provided it is retained, is intended to prevent the embedding of the fertilised ovum.

The advantages of such an unexacting method are so manifest that the device was fairly widely studied some fifteen years ago, both here and on the Continent. Unfortunately, the risks in its use have proved greater than were at first anticipated. In addition to the fact that, even in cases where the ring is retained, the failure-rate is high (at least 5%, the ring often being born with the baby), the incidence of pain, menorrhagia, and metrorrhagia has been considerable, and subacute infections and acute salpingitis have been caused in healthy nulliparous women. Moreover, the technique entails the utmost danger to women who have previously had, or who contract, gonorrhœa; one such patient required hysterectomy.

Within the last few months this device has achieved an alarming popularity, for certain practitioners claim it to be the method of choice, even for young nulliparous brides. Members of this committee have met with many cases of infective lesions occurring in such patients, which they will be happy to publish if it appears necessary. It is very difficult for the average practitioner to get guidance on such a matter, and, without it, he is at a great disadvantage when his patients claim to have had friends who have been highly delighted with the method.

In point of fact, no progress has recently been made in the essentials of the ordinary contraceptive technique for security, either some type of occlusive rubber ca must be used by the wife, in conjunction with a chemic spermicide; or a sheath, preferably with a spermicid must be used by the husband. Such methods are non injurious, and offer a high degree of safety (at leas 98% used over ten fertile years) provided they ar competently chosen and applied.

My committee would be grateful if you would allo this warning to reach fellow practitioners.

Family Planning Association,
London, S.W.1.

M. A. Pyke
Hon. Secretary.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

Sir,—In reading Mr. Hermon Taylor's article o Sept. 28 and your leader of Oct. 5 I was amazed by th omission of both to refer to previous American article *on conservative treatment. I have a reference date* 1943. A short note on the method describing a smal series was published in this country last year. Th impression given is that this is a new method invente by Hermon Taylor, which is wrong. Hedley Visick, o York, has adopted conservative treatment for all perfora tions as a routine for the last two years with, I believe uniform success. The results of all methods acknowledg the tremendous mortality associated with this catas trophe, a condition of affairs that is regarded wit equanimity by most surgeons in that the condition is as you point out, usually looked upon as only worthy o the attention of a house-surgeon or resident surgica officer. The normal operative mortality is 20%.

You refer to one or two series of operative results in early cases with a small mortality; that this need not be regarded as only to be achieved by a few is shown by my own series of 50 cases with 2 deaths in eight years, cases not selected and including perforations up to three days old. My own routine is to avoid general anæsthesia except in the young and healthy adult, and in all other cases to use spinal or local with morphine; this ensures the absence of those postoperative chest conditions which are so fatal. There is no way in which we can be sure that the perforation is sealed off. My last case was in a girl of 21, severely shocked and with a rigid board-like abdomen. Operation showed a large perforation in the anterior wall of the stomach into which one could put the tip of a finger. In my opinion it would have been criminal not to have operated on this girl. Two days later she was sitting up smiling and on a normal diet. In some cases we can assume from the mildness of the symptoms and the relative well-bei of the patient that it is justifiable not to operate, and following the lead of Visick I have treated 4 cases this year conservatively without a death, each being proved radiologically or at subsequent operation.

All surgeons should know that the use of a drainage-tube in a perforation is dangerous as well as useless. Subphrenic abscess and pelvic abscess occur where tubes are used, and intestinal obstruction frequently follows its use in the pelvis. I have not used a drainage-tube in a perforation for over ten years, and I have not had an intestinal obstruction and only one subphrenic abscess. It is unnecessary to use chemotherapy as a routine; as Patey recently pointed out, cases which have been on prophylactic penicillin and/or sulphathiazole will still develop chest complications, and I have had one postoperative death, following a gastrectomy where a chest complication was anticipated, where penicillin and sulphathiazole were both used from efore the operation and the patient died of a bilateral ronchopneumonia.

---

[1] Lancet, 1946, i, 919.
[2] Physiological Basis of Medical Practice, London, 1943, p. 1159.

After operation many cases develop pyloric obstruction, and the surgeon must be prepared to recognise this early and perform a further operation within a few days when it is clear that the stomach contents will not pass freely through a pylorus narrowed both by the original ulcer and by the sutures used to obliterate it. No-one who reopens an abdomen a few days after a perforation can fail to be struck by the clean appearance of the abdominal contents and the absence of adhesions, or to realise that it is unnecessary to remove the fluid present at the time of operation and to insert a drainage-tube with the object of letting it off. In any case a drainage-tube does not carry out this function since it is rare for more than a few ounces to exude from it.

My experience as R.S.O. in several hospitals taught me that the mortality following perforations was due to carelessness or ignorance on the part of the operator; the use of general anæsthesia in debilitated patients or those with chest or heart lesions; the failure to recognise postoperative intestinal obstruction until it was too late; the failure to appreciate that the pylorus might be mechanically obstructed; the inability to diagnose subphrenic abscess; and the insistence on draining pelvic abscesses when diagnosed suprapubically rather than through the rectum.

In a hospital where the operative mortality is the generally accepted one of 20%, conservative treatment should have no greater risk and may, by the avoidance of an operation, have a lower one. Where, however, the surgeon can be sure of a reasonable mortality of under 5% then it seems to me that conservative treatment should not be the routine but should be used in selected cases where the crisis of the disease is over and the patient is already recovering.

Halifax General Hospital. H. I. DEITCH.

CHILDREN IN DAY NURSERIES

SIR,—The argument in Dr. Hilda Menzies's paper of Oct. 5 is that since a substantial proportion of the children did not make satisfactory progress as judged by weight gains in the first or second 3 months after admission to the nurseries, and since the children had almost double rations compared with those under the care of their mothers, their unsatisfactory progress was more likely to be due to emotional disturbances than to "anything so simple as lack of proper food."

Broadly, Dr. Menzies found that approximately a third or a quarter of the children admitted at ages between 1 and 2 years had unsatisfactory weight gains in the first 3 months, and approximately the same proportion had unsatisfactory weight gains in the second 3 months. There is no information on fluctuations in weight growth of preschool-children in this country, but if the experience for preschool-children in other countries and for older children in this country can be taken as a guide, then the same sort of fluctuations could be expected for children under their mothers' care as were found for children after admission to the day nurseries.

The practical significance to health of short-term fluctuations in weight growth has not so far been satisfactorily explained. From a recent Australian study,[1] no explanation could be given of them in young children living in child centres; Bransby[2] found short-term fluctuations in weight growth in older children with a good health record and living in a good environment. By all accounts the latter children were happy and contented. The short-term fluctuations in weight growth of these two groups of children might, of course, have been due to emotional disturbances, but they might well have been due to some other physiological or environmental factor. Similarly, emotional disturbance or some other factor may have been responsible for the short-term fluctuations found by Dr. Menzies. Her argument concerning emotional disturbances would have been strengthened had data been presented to show that the children who were emotionally disturbed did, in fact, have unsatisfactory weight gains and vice versa.

Ministry of Health. E. R. BRANSBY.

---

[1] Commonwealth of Australia Department of Health (1945): The Lady Gowrie Child Centres. Commonwealth Government Printer, Canberra.

[2] Bransby, E. R. *Med. Offr*, Sept. 22, 1945.

SIR,—I was extremely interested in the article by Dr. Menzies. It gives confirmation to a thesis on the dangers of separation anxiety in young children which I, in common with other psychiatrists, have held for some time now. My own observations were made on hospitalised children and are embodied in a monograph (Separation Anxiety in Young Children. Genetic Psychology Monographs, 1943). Others have written to you at different times, notably in connexion with the evacuation of children during the war, and a letter in the *British Medical Journal* (1939, ii, 1202) from Dr. John Bowlby, Dr. Emanuel Miller, and Dr. D. W. Winnicott is so apposite that I cannot forbear to quote at least part of it here:

> "There are dangers in the interference with the life of a toddler which have but little counterpart in the case of older children. . . . Apart from such a gross abnormality as chronic delinquency, mild behaviour disorders, anxiety and a tendency to vague physical illness can often be traced to such disturbances of the little child's environment [i.e., removal from home] and most mothers of small children recognise this by being unwilling to leave their little children for more than very short periods."

Though the findings of analytic psychiatry on this point have up to now been more or less disregarded, perhaps this corroboration of their views by Dr. Menzies's carefully recorded experience will call more attention to them. To quote again, this time from my own paper:

> "In these days with increasing interference of the State in the handling of even very young children it is as well to be aware of all the pitfalls involved. One cannot know too much of the consequences of interference when dealing with two such fundamental biological urges as the parental instinct and its counterpart . . . [the need for] security and dependence. . . ."

Leeds. H. EDELSTON.

SIR ALMROTH WRIGHT AND ANTI-TYPHOID INOCULATION

SIR,—I am much indebted to Dr. Leonard Colebrook for drawing attention in your issue of Sept. 14 to an apparent mis-statement in my *History of Medicine*. I admit that, on page 348, I have unwittingly conveyed the impression that Sir William Leishman was the originator of anti-typhoid inoculation "along with Sir Almroth Wright," although, on a previous page (288), I describe Sir Almroth Wright as "the pioneer of vaccine therapy and of anti-typhoid inoculation."

Of course the title of "originator," although I did not use that word, belongs to Sir Almroth Wright, whose outstanding achievement in the field of preventive inoculation is certainly a landmark in the history of medicine. Sir William Leishman, it would appear, simply gave his powerful support to the introduction of the method into the British Army. I need scarcely add that the paragraph will be revised in any future edition of my book.

Edinburgh. DOUGLAS GUTHRIE.

SPLANCHNIC BLOCK, ELECTROLYTE BALANCE, AND URÆMIA

SIR,—Recent correspondence on uræmia following trauma or abortion has suggested that this condition can be successfully treated by restoration of the renal circulation, either by splanchnic block or by correction of the electrolyte balance. While I do not propose to question the correctness of both these procedures, I should like to draw attention to their limitations.

Although successful cases of splanchnic block in the human have been reported, Porritt et al.[1] were not impressed by its use in the casualties from B.L.A. The reason for this failure lies in the fact that the kidney will withstand ischæmia for only a limited period,[2] and, should the renal circulation be deranged long enough to even than bovine plasma, the application of denaturation to egg-white albumin might well be worth further study—a thing which I will certainly do unless someone better qualified and with better facilities does it first.

---

[1] Porritt, A. E., Debenham, R. K., Ross, C. C. *Brit. med. J.* 1945, ii, 377.

[2] Allen, F. M. *J. Urol.* 1943, 49, 515. Scarff, R. W., Keele, C. A. *Brit. J. exp. Path.* 1943, 24, 147. van Slyke, D. D., Phillips, R. A., Hamilton, P. B., Archibald, R. M., Dole, V. P., Emerson, K. *Trans. Ass. Amer. Phys.* 1944, 58, 119. Badenoch, A. W., Darmady, E. M. (in the press).

I am extremely glad that Dr. Massons has given us the details of his procedure and investigations into the properties of denatured calf plasma, and I hope that he will publish soon the metabolic studies complementary to its use in hypoproteinæmic states.

Brixham, Devon. R. ARTHUR HUGHES.

TUBERCULOUS GLANDS AND CALCIFEROL

SIR,—In his letter of Sept. 28 (p. 473) Dr. Wallace writes that treatment of tuberculous glands with calciferol seems "helpful when sinus formation is present" but that it "has a clinically adverse effect on glands which have not broken down." He admits that this is "little more than an impression." I should like to record that in three cases of tuberculous cervical adenitis of the multiple type, without sinus formation, quite unsuitable for treatment by radical excision, there has been a markedly favourable response to calciferol, resulting in a reduction in size of the masses in the neck sufficient to excite pleased comment from the three patients concerned. It would be ridiculous to draw any conclusions from this. My sole purpose is to register an "impression" quite different from that of Dr. Wallace.

Dr. Wallace is right when he advises that calciferol should be given with caution when pulmonary tuberculosis is present, at any rate until more is known about its effect on this condition. On the theory that the beneficial effect of calciferol on lupus might be due to a specific effect on squamous epithelium I treated four cases of tuberculous laryngitis accompanying pulmonary tuberculosis by the administration of 100,000 to 150,000 units of calciferol daily. This treatment had to be abandoned after 5 days owing to undesirable toxic effects.

Though Dowling and Prosser Thomas[1] declare that the effect of calciferol on lupus does not seem to be related either to symptoms of toxicity or to the serum-calcium level, this point obviously requires further elucidation. Clinically, this might be done by treating a series of cases with parathyroid extract and large doses of calcium or by other measures designed to keep the serum-calcium at an abnormally high level.

Best and Taylor[2] point out that the overdosage effects of parathyroid and irradiated ergosterol are similar. Both cause the same degree of hypercalcæmia, hyperphosphatæmia, and a rise in the non-protein nitrogen of the blood. The symptoms during life and the post-mortem findings after poisoning with either material are identical.

A comparison of series of cases treated by the two methods might shed important light on the mechanism by which calciferol produces its effect on lupus lesions.

Neath, Glamorgan. T. FRANCIS JARMAN.

CONTRACEPTION WITH THE SILVER RING

SIR,—The medical committee feels that a warning should be given concerning the sudden revival of a method of contraception called the silver or Grafenberg ring.

This appliance consists of a small ring, composed of silver, platinum, or other metal, which is inserted into the uterine cavity, where its presence, provided it is retained, is intended to prevent the embedding of the fertilised ovum.

The advantages of such an unexacting method are so manifest that the device was fairly widely studied some fifteen years ago, both here and on the Continent. Unfortunately, the risks in its use have proved greater than were at first anticipated. In addition to the fact that, even in cases where the ring is retained, the failure-rate is high (at least 5 %, the ring often being born with the baby), the incidence of pain, menorrhagia, and metrorrhagia has been considerable, and subacute infections and acute salpingitis have been caused in healthy nulliparous women. Moreover, the technique entails the utmost danger to women who have previously had, or who contract, gonorrhœa; one such patient required hysterectomy.

Within the last few months this device has achieved an alarming popularity, for certain practitioners claim it to be the method of choice, even for young nulliparous brides. Members of this committee have met with many cases of infective lesions occurring in such patients which they will be happy to publish if it appears necessary. It is very difficult for the average practitioner to get guidance on such a matter, and, without it, he is at a great disadvantage when his patients claim to have had friends who have been highly delighted with the method.

In point of fact, no progress has recently been made in the essentials of the ordinary contraceptive technique: for security, either some type of occlusive rubber cap must be used by the wife, in conjunction with a chemical spermicide; or a sheath, preferably with a spermicide, must be used by the husband. Such methods are non-injurious, and offer a high degree of safety (at least 98 % used over ten fertile years) provided they are competently chosen and applied.

My committee would be grateful if you would allow this warning to reach fellow practitioners.

Family Planning Association,
London, S.W.1.

M. A. PYKE
Hon. Secretary.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—In reading Mr. Hermon Taylor's article of Sept. 28 and your leader of Oct. 5 I was amazed by the omission of both to refer to previous American articles on conservative treatment. I have a reference dated 1943. A short note on the method describing a small series was published in this country last year. The impression given is that this is a new method invented by Hermon Taylor, which is wrong. Hedley Visick, of York, has adopted conservative treatment for all perforations as a routine for the last two years with, I believe, uniform success. The results of all methods acknowledge the tremendous mortality associated with this catastrophe, a condition of affairs that is regarded with equanimity by most surgeons in that the condition is, as you point out, usually looked upon as only worthy of the attention of a house-surgeon or resident surgical officer. The normal operative mortality is 20 %.

You refer to one or two series of operative results in early cases with a small mortality; that this need not be regarded as only to be achieved by a few is shown by my own series of 50 cases with 2 deaths in eight years, cases not selected and including perforations up to three days old. My own routine is to avoid general anæsthesia except in the young and healthy adult, and in all other cases to use spinal or local with morphine; this ensures the absence of those postoperative chest conditions which are so fatal. There is no way in which we can be sure that the perforation is sealed off. My last case was in a girl of 21, severely shocked and with a rigid board-like abdomen. Operation showed a large perforation in the anterior wall of the stomach into which one could put the tip of a finger. In my opinion it would have been criminal not to have operated on this girl. Two days later she was sitting up smiling and on a normal diet. In some cases we can assume from the mildness of the symptoms and the relative well-being of the patient that it is justifiable not to operate, and following the lead of Visick I have treated 4 cases this year conservatively without a death, each being proved radiologically or at subsequent operation.

All surgeons should know that the use of a drainage-tube in a perforation is dangerous as well as useless. Subphrenic abscess and pelvic abscess occur where tubes are used, and intestinal obstruction frequently follows its use in the pelvis. I have not used a drainage-tube in a perforation for over ten years, and I have not had an intestinal obstruction and only one subphrenic abscess. It is unnecessary to use chemotherapy as a routine; as Patey recently pointed out, cases which have been on prophylactic penicillin and/or sulphathiazole will still develop chest complications, and I have had one postoperative death, following a gastrectomy where a chest complication was anticipated, where penicillin and sulphathiazole were both used from

---

[1] *Lancet*, 1946, i, 919.
[2] Physiological Basis of Medical Practice, London, 1943, p. 1189.

Obituary

STANLEY WYARD

M.D. LOND., F.R.C.P.

Dr. Stanley Wyard, physician to the Cancer Hospital and the Princess Beatrice Hospital, London, who died on Sept 29, was a first-class physician whose clinical acumen was founded on experience as a clinical pathologist. The son of the late Rev. G. L. Wyard, of Bournemouth, he was educated privately and at the University Colleges of Cardiff and London. After graduating M.B. Lond. in 1909 he held house-appointments at the West London Hospital before taking up a research assistantship in pathology at Leeds. He returned to London to set up in consulting practice, joining the staff of the Bolingbroke Hospital, the Belgrave Hospital, and the Victoria Hospital, Chelsea. His earliest bent was thus for pædiatrics, but he retained his interest in pathology, and alongside his other work he found time to act as medical registrar at the Cancer Hospital, where he was later appointed to the staff. Besides the well-known *Clinical Atlas of Blood Diseases*, of which he was part author, he also published in 1927 a *Handbook of Diseases of the Stomach* which reflected his wise judgment and wide experience. The first world war interrupted his clinical work, for he served in France with the R.A.M.C. as a pathologist. In the last war he took on additional work as temporary consulting physician to Hounslow Hospital and, under the E.M.S., as physician at the South Middlesex Hospital.

His clinical work was characterised by the great interest he took over every aspect of each case, which won him the confidence of patient and doctor alike. Scrupulously upright and honest in all his dealing, as a colleague writes, "he had no axe to grind but just did a good job of work." With his command over affection and respect he made an excellent chairman of the medical committee at the Princess Beatrice Hospital, and until lately he also served as chairman of the board of management of the Victoria Hospital. Behind his quiet exterior he had tremendous moral courage, and when many months ago he realised that he was suffering from a fatal illness he told no-one inside or outside his family but carried on as long as he could with no change in manner or appearance. His ambition had been to retire when he was 60—just about his age when he died—and go to live in South Africa where he hoped to find leisure and light for his favourite recreations—photography and biology—and to continue his games of golf which the war had interrupted.

ARTHUR NORMAN BOYCOTT

M.D. LOND.

Dr. A. N. Boycott, who died on Sept. 17, was a well-known figure in St. Albans, where he had lived since his appointment as medical superintendent to Hill End Mental Hospital in 1898. The third son of the late Richard Boycott, of Rugeley, he was born in Lucknow in 1866 and was educated at Monmouth School, where he was a brilliant scholar and a good athlete. He qualified at St. Thomas's Hospital in 1888, winning the Cheselden medal in surgery, and in 1893 took his London M.D. After holding a house-appointment at St. Thomas's under Sir William MacCormac he went to Cane Hill Hospital in 1890 as assistant medical officer to start a long and successful career in mental diseases. At the age of 32 he was appointed to Hill End Hospital, where as the first medical superintendent he was responsible for organising and equipping the new hospital. He worked hard to raise the standard of medical and nursing care and to improve the welfare of his patients and his staff, and his kindly administration earned him a lasting reputation and affection. A member for many years of the Royal Medico-Psychological Association, he took a great interest in improving the training of mental nurses. In 1925 he retired from the superintendentship of the hospital, but he continued to work as a consultant to the Hertfordshire county council until the early years of the war.

Apart from his professional work Dr. Boycott had many other activities. As secretary and later treasurer of the St. Albans branch he was intimately connected with the Red Cross in Hertfordshire, and during the second world war he spent much time doing Red Cross work for the relatives of prisoners-of-war. He was also a governor of the St. Albans School and a trustee of the Kentish Educational Foundation. His friends in the profession and in St. Albans will miss him not only for his work but for his kindly quiet manner and his steadfastness.

In 1905 he married Lota, the eldest daughter of the late Edward Griffith Brewer, who survives him with their only daughter.

RICHARD JAMES CAMPBELL THOMPSON

C.M.G., D.S.O., M.D. DURH., M.R.C.P.

Lieut.-Colonel R. J. C. Thompson died on Oct. 2 in St. Thomas's Hospital, London, where he had been secretary to the medical school for over twenty years. Born in 1880, the son of R. P. Thompson, of Stamford, he came to St. Thomas's as a medical student in 1898 from Marlborough, and became a prominent member of one of the great rugby football teams which the hospital produced at that period. He qualified in 1904, and after doing hospital appointments in 1905 he joined the R.A.M.C. Five years later he was seconded to the Egyptian Army to serve on the Sudan Sleeping Sickness Commission where Andrew Balfour was one of his associates. As a result of the investigations of the commission extensive measures were introduced which have proved successful in controlling sleeping sickness in the southern Sudan. Returning to the R.A.M.C. in the first world war he established a reputation as commanding officer of one of the best casualty-clearing stations in France. An injury to his leg led to his being invalided out of the Service. From 1919 to 1922, while acting as physician and surgeon to the Royal Hospital, Chelsea, he took the M.R.C.P. and the M.D. Durh. To this period also belong his papers on the problems of old age. For a short time he practised in Bordighera, but his main life's work began when he returned to St. Thomas's Hospital as secretary to the medical school.

Tommy Thompson, as he was generally called, was a man big in physique and heart, whose charm of manner brought him friends wherever he moved. He had the power of evoking affection, and consequently willing work from all his staff and subordinates, and he filled his post as secretary with energy and success. The death of his only son, whose plane failed to return from an Atlantic patrol, was a crushing blow from which he never entirely recovered, and after he retired a few weeks ago from St. Thomas's he seemed to have little zest left for life.

HENRY BEECHER JACKSON

M.A. CAMB., M.R.C.S.

Dr. Beecher Jackson, who died in the Wilson Hospital, Mitcham, on Oct. 8, succeeded his father as coroner for Croydon, and together they held office for nearly sixty years. From Epsom College he obtained an open exhibition to Clare College, Cambridge, and on leaving the university he was admitted to the roll of solicitors. In 1918 he obtained his medical qualification at St. Bartholomew's Hospital, after serving in the first world war as a temporary surgeon in the Royal Navy. In 1919 he succeeded his father in the office to which he had an obvious vocation, and for which he had assiduously prepared himself by constant attendance at the London coroners' courts. He was noted for his attention to detail, his courtesy, and his consideration. In 1939 he presided over the Coroners' Society. He leaves a widow and one daughter.

". . . Rifle bullets kill men, but atomic bombs kill cities. Our defense is not in armaments, nor in science, nor in going underground. Our defense is in law and order. . . . I do not believe that we can prepare for war and at the same time prepare for a world community. . . . Science has brought forth this danger, but the real problem is in the minds and hearts of men. We will not change the hearts of other men by mechanisms, but by changing *our* hearts and speaking bravely."
—Prof. ALBERT EINSTEIN, *New York Times Magazine.*

cause massive degeneration of the kidney epithelium, death will certainly follow from accumulation of waste products.

I am hoping to show in a paper to be published shortly that in some cases, even if electrolyte-balance is established early, death from uræmia still occurs. Moreover, that when the syndrome is fully developed there is considerable risk in giving fluid intravenously, since not only is the alkali reserve, sodium and chloride, difficult to maintain but there is also danger of overloading the circulation.

The area and extent of the renal necrosis must be the factor which determines unassisted recovery, but if the accumulation of waste products—in particular potassium—can be removed until such time as the kidney regenerates there is greater chance of the patient surviving. An apparatus for such a purpose, consisting of pump and dialysing membrane, has already been put forward by Kolff and Berk[3] and recommended by Bywaters[4] and Snapper.[5]

Simplification and modification of these methods are now under consideration at this laboratory and show promising results.

Pathological Dept., Salisbury Infirmary, Salisbury. E. M. DARMADY.

PILONIDAL SINUS

SIR,—After reading the article on postanal pilonidal sinus by Patey and Scarff in your issue of Oct. 5 I cannot understand their readiness to relegate the developmental theory to a secondary place. They state that an uninfected sequestration dermoid—ought it not to be dermoid fistula or cyst?—is almost never encountered; but does not this depend on whether it is looked for? I have found a few, symptomless, in patients complaining of other conditions. It does not seem to be appreciated by many practitioners that the congenital opening is extremely small and sometimes multiple. I have seen an eminent rectal surgeon demonstrate, to his own satisfaction, that no external opening was present by using a probe with an end as big as a match-head. Another case recurred after a drastic excision which had left the congenital opening intact. To demonstrate this opening I find a fine straight sewing needle, used eye end first, a useful probe.

Patey and Scarff seriously suggest that the fine hairs found in this region are capable of penetrating the skin, but an examination of the hairs in the sinus will show that they are often of considerable length, and must have grown from the wall of the sinus. Their conclusion that the pilonidal sinus in the hand was due to puncture by a hair seems incorrect in view of the histological picture, which showed a hair follicle in the wall of the sinus. The explanation of the recurrent sinus, longer than the original, containing dead hairs may simply be that the upper end of the sinus was not excised; hairs and debris from the remnant continued to collect and formed a sinus in the dead space left by operation.

On the choice of operation your editorial puts the position fairly. If it is undertaken in the "cold" stage, with careful excision of the track and its offshoots and care in suturing to obliterate dead spaces, there should be no need for any of the fanciful operations devised.

Plymouth. EDRIC WILSON.

SIR,—Patey and Scarff state that this condition in the majority of cases is not of congenital origin. They base this dogmatic statement on the slender and inconclusive evidence of being unable to find an epithelial lining in 13 out of 21 cases, and a description of an interdigital sinus in a barber's hand.

In 1933 (*Brit. J. Surg.* 1933, **21**, 219) I fully described the condition under the title of Coccygeal Sinus, and (as I thought) conclusively proved with histological evidence that such sinuses are congenital in origin. They can, of course, be easily confused with other septic conditions. A coccygeal or pilonidal sinus is a definite clinical entity and is always characterised by one or several minute openings situated accurately in the middle line. It requires careful observation to detect these openings. I have seen them many times in the newbo the adult, and elderly, causing no symptoms whatev It is only when they become infected that they give ri to trouble, with the resulting secondary sinus lined wi granulation tissue.

I venture to suggest to the authors that if they we to restrict their observations to the true pilonidal sin and were to take serial microscopic sections of th excised tissue they would in all cases find the epithel lining. Having operated upon a very large series o these cases I am confident that the theory I advance is the true one.

It seems a pity that a paper emanating from th Bland-Sutton Institute of Pathology should make no reference to Sir John Bland-Sutton, that supreme an accurate observer, who in his classic book *Tumou Innocent and Malignant* regarded these sinuses as du to faulty coalescence of the skin. He even suggeste they were comparable to the interdigital pouch of th sheep and stated that similar interdigital pouches occu in connexion with webbed fingers in man.

Manchester. R. L. NEWELL.

DISTRIBUTION OF DISSEMINATED SCLEROSI

SIR,—Disseminated sclerosis is well known to be common in some countries (e.g., Switzerland) and very rare in others (e.g., South Africa). Its incidence varies also in different parts of a country, for it is more common in north than in south Switzerland.

Investigations at present being carried out indicate that disseminated sclerosis is relatively common in England, and that patients suffering from the disease number 2–4 per 10,000 population. There seem, however, to be certain parts of the country where it is much more common than this, and others in which it is rarely, if ever, seen.

Information regarding its geographical distribution is being collected here for research purposes, and if any doctor can give information regarding its local incidence, or has been impressed by its frequency or rarity in his district, we should be grateful if he would communicate with us. Areas of the country where the disease does not occur are just as important as those in which it is frequen

W. RITCHIE RUSSELL.

Radcliffe Infirmary (Neurology), Oxford.

EARLY OVULATION

SIR,—The conclusions that Dr. Sevitt draws in his article of Sept. 28 may be unintentionally misleading. He says: (1) ". . . ovulation can occur on any day of the first half of the cycle"; (2) ". . . it appears therefore that premature ovulation is not uncommon"; and (3) ". . . it follows that there is no safe period in the first half of the cycle."

Of his 10 cases there is not one with a normal menstrual history. All except 2 are menorrhagias, which may be due to an endocrine disturbance, as in fact he seems to prove with the sections. The other 2 were cases of severe leucorrhœa. One of the causes of "functional" menorrhagia is claimed to be an excessive development of the secretory endometrium. Dr. Sevitt seems to confirm this and even shows that ovulation seems to occur early in this type of case—i.e., the luteal phase lasts longer than the normal 14 days and presumably gives rise to an abnormally thick endometrium, though he has no sections to confirm this.

In case 6 he found an early secretory endometrium during the bleeding phase. I cannot see why he postulates a new corpus luteum, since the same findings can surely be expected with a persistent corpus luteum or with an incomplete shedding of the endometrium, imperfectly stimulated to secretion by the corpus luteum of the previous cycle. In case 9, the only evidence he gives for a "very early secretory phase" is vacuolation and basal nuclei with some dilated glands of the endometrium. This change can be produced by a high œstrogen blood-level in the absence of a functioning corpus luteum, and therefore ovulation.

I feel therefore that the conclusions I have quoted can stand only if the words "in some cases of menorrhagia" are added at the end of each.

W. P. HIRSCH.

London, N.W.6.

---

3. Kolff, W. J., Berk, H. T. J. *Acta med. scand.* 1944, 117, 121.
4. Bywaters, E. G. L. *Brit. med. Bull.* 1945, 3, 107.
5. Snapper, I. *J. Amer. med. Ass.* 1946, 131, 251.

Obituary

STANLEY WYARD

M.D. LOND., F.R.C.P.

Dr. Stanley Wyard, physician to the Cancer ospital and the Princess Beatrice Hospital, London. ho died on Sept 29, was a first-class physician whose inical acumen was founded on experience as a clinical pathologist. The son of the late Rev. G. L. Wyard, of ournemouth, he was educated privately and at the niversity Colleges of Cardiff and London. After raduating M.B. Lond. in 1909 he held house-appointments t the West London Hospital before taking up a research ssistantship in pathology at Leeds. He returned to London to set up in consulting practice, joining the staff f the Bolingbroke Hospital, the Belgrave Hospital, and he Victoria Hospital, Chelsea. His earliest bent was hus for pædiatrics, but he retained his interest in pathology, and alongside his other work he found time o act as medical registrar at the Cancer Hospital, where he was later appointed to the staff. Besides the well-known *Clinical Atlas of Blood Diseases*, of which he was part author, he also published in 1927 a *Handbook of Diseases of the Stomach* which reflected his wise judgment and wide experience. The first world war interrupted his clinical work, for he served in France with the R.A.M.C. as a pathologist. In the last war he took on additional work as temporary consulting physician to Hounslow Hospital and, under the E.M.S., as physician at the South Middlesex Hospital.

His clinical work was characterised by the great interest he took over every aspect of each case, which won him the confidence of patient and doctor alike. Scrupulously upright and honest in all his dealing, as a colleague writes, "he had no axe to grind but just did a good job of work." With his command over affection and respect he made an excellent chairman of the medical committee at the Princess Beatrice Hospital, and until lately he also served as chairman of the board of management of the Victoria Hospital. Behind his quiet exterior he had tremendous moral courage, and when many months ago he realised that he was suffering from a fatal illness he told no-one inside or outside his family but carried on as long as he could with no change in manner or appearance. His ambition had been to retire when he was 60—just about his age when he died—and go to live in South Africa where he hoped to find leisure and light for his favourite recreations—photography and biology—and to continue his games of golf which the war had interrupted.

ARTHUR NORMAN BOYCOTT

M.D. LOND.

Dr. A. N. Boycott, who died on Sept. 17, was a well-known figure in St. Albans, where he had lived since his appointment as medical superintendent to Hill End Mental Hospital in 1898. The third son of the late Richard Boycott, of Rugeley, he was born in Lucknow in 1866 and was educated at Monmouth School, where he was a brilliant scholar and a good athlete. He qualified at St. Thomas's Hospital in 1888, winning the Cheselden medal in surgery, and in 1893 took his London M.D. After holding a house-appointment at St. Thomas's under Sir William MacCormac he went to Cane Hill Hospital in 1890 as assistant medical officer to start a long and successful career in mental diseases. At the age of 32 he was appointed to Hill End Hospital, where as the first medical superintendent he was responsible for organising and equipping the new hospital. He worked hard to raise the standard of medical and nursing care and to improve the welfare of his patients and his staff, and his kindly administration earned him a lasting reputation and affection. A member for many years of the Royal Medico-Psychological Association, he took a great interest in improving the training of mental nurses. In 1925 he retired from the superintendentship of the hospital, but he continued to work as a consultant to the Hertfordshire county council until the early years of the war.

Apart from his professional work Dr. Boycott had many other activities. As secretary and later treasurer of the St. Albans branch he was intimately connected with the Red Cross in Hertfordshire, and during the second world war he spent much time doing Red Cross work for the relatives of prisoners-of-war. He was also a governor of the St. Albans School and a trustee of the Kentish Educational Foundation. His friends in the profession and in St. Albans will miss him not only for his work but for his kindly quiet manner and his steadfastness.

In 1905 he married Lota, the eldest daughter of the late Edward Griffith Brewer, who survives him with their only daughter.

RICHARD JAMES CAMPBELL THOMPSON

C.M.G., D.S.O., M.D. DURH., M.R.C.P.

Lieut.-Colonel R. J. C. Thompson died on Oct. 2 in St. Thomas's Hospital, London, where he had been secretary to the medical school for over twenty years. Born in 1880, the son of R. P. Thompson, of Stamford, he came to St. Thomas's as a medical student in 1898 from Marlborough, and became a prominent member of one of the great rugby football teams which the hospital produced at that period. He qualified in 1904, and after doing hospital appointments in 1905 he joined the R.A.M.C. Five years later he was seconded to the Egyptian Army to serve on the Sudan Sleeping Sickness Commission where Andrew Balfour was one of his associates. As a result of the investigations of the commission extensive measures were introduced which have proved successful in controlling sleeping sickness in the southern Sudan. Returning to the R.A.M.C. in the first world war he established a reputation as commanding officer of one of the best casualty-clearing stations in France. An injury to his leg led to his being invalided out of the Service. From 1919 to 1922, while acting as physician and surgeon to the Royal Hospital, Chelsea, he took the M.R.C.P. and the M.D. Durh. To this period also belong his papers on the problems of old age. For a short time he practised in Bordighera, but his main life's work began when he returned to St. Thomas's Hospital as secretary to the medical school.

Tommy Thompson, as he was generally called, was a man big in physique and heart, whose charm of manner brought him friends wherever he moved. He had the power of evoking affection, and consequently willing work from all his staff and subordinates, and he filled his post as secretary with energy and success. The death of his only son, whose plane failed to return from an Atlantic patrol, was a crushing blow from which he never entirely recovered, and after he retired a few weeks ago from St. Thomas's he seemed to have little zest left for life.

HENRY BEECHER JACKSON

M.A. CAMB., M.R.C.S.

Dr. Beecher Jackson, who died in the Wilson Hospital, Mitcham, on Oct. 8, succeeded his father as coroner for Croydon, and together they held office for nearly sixty years. From Epsom College he obtained an open exhibition to Clare College, Cambridge, and on leaving the university he was admitted to the roll of solicitors. In 1918 he obtained his medical qualification at St. Bartholomew's Hospital, after serving in the first world war as a temporary surgeon in the Royal Navy. In 1919 he succeeded his father in the office to which he had an obvious vocation, and for which he had assiduously prepared himself by constant attendance at the London coroners' courts. He was noted for his attention to detail, his courtesy, and his consideration. In 1939 he presided over the Coroners' Society. He leaves a widow and one daughter.

". . . Rifle bullets kill men, but atomic bombs kill cities. Our defense is not in armaments, nor in science, nor in going underground. Our defense is in law and order. . . . I do not believe that we can prepare for war and at the same time prepare for a world community. . . . Science has brought forth this danger, but the real problem is in the minds and hearts of men. We will not change the hearts of other men by mechanisms, but by changing *our* hearts and speaking bravely."
—Prof. ALBERT EINSTEIN, *New York Times Magazine.*

cause massive degeneration of the kidney epithelium, death will certainly follow from accumulation of waste products.

I am hoping to show in a paper to be published shortly that in some cases, even if electrolyte-balance is established early, death from uræmia still occurs. Moreover, that when the syndrome is fully developed there is considerable risk in giving fluid intravenously, since not only is the alkali reserve, sodium and chloride, difficult to maintain but there is also danger of overloading the circulation.

The area and extent of the renal necrosis must be the factor which determines unassisted recovery, but if the accumulation of waste products—in particular potassium—can be removed until such time as the kidney regenerates there is greater chance of the patient surviving. An apparatus for such a purpose, consisting of pump and dialysing membrane, has already been put forward by Kolff and Berk[3] and recommended by Bywaters[4] and Snapper.[5]

Simplification and modification of these methods are now under consideration at this laboratory and show promising results.

Pathological Dept., Salisbury Infirmary, Salisbury. **E. M. DARMADY.**

PILONIDAL SINUS

SIR,—After reading the article on postanal pilonidal sinus by Patey and Scarff in your issue of Oct. 5 I cannot understand their readiness to relegate the developmental theory to a secondary place. They state that an uninfected sequestration dermoid—ought it not to be dermoid fistula or cyst?—is almost never encountered; but does not this depend on whether it is looked for? I have found a few, symptomless, in patients complaining of other conditions. It does not seem to be appreciated by many practitioners that the congenital opening is extremely small and sometimes multiple. I have seen an eminent rectal surgeon demonstrate, to his own satisfaction, that no external opening was present by using a probe with an end as big as a match-head. Another case recurred after a drastic excision which had left the congenital opening intact. To demonstrate this opening I find a fine straight sewing needle, used eye end first, a useful probe.

Patey and Scarff seriously suggest that the fine hairs found in this region are capable of penetrating the skin, but an examination of the hairs in the sinus will show that they are often of considerable length, and must have grown from the wall of the sinus. Their conclusion that the pilonidal sinus in the hand was due to puncture by a hair seems incorrect in view of the histological picture, which showed a hair follicle in the wall of the sinus. The explanation of the recurrent sinus, longer than the original, containing dead hairs may simply be that the upper end of the sinus was not excised; hairs and debris from the remnant continued to collect and formed a sinus in the dead space left by operation.

On the choice of operation your editorial puts the position fairly. If it is undertaken in the "cold" stage, with careful excision of the track and its offshoots and care in suturing to obliterate dead spaces, there should be no need for any of the fanciful operations devised.

Plymouth. **EDRIC WILSON.**

SIR,—Patey and Scarff state that this condition in the majority of cases is not of congenital origin. They base this dogmatic statement on the slender and inconclusive evidence of being unable to find an epithelial lining in 13 out of 21 cases, and a description of an interdigital sinus in a barber's hand.

In 1933 (*Brit. J. Surg.* 1933, 21, 219) I fully described the condition under the title of Coccygeal Sinus, and (as I thought) conclusively proved with histological evidence that such sinuses are congenital in origin. They can, of course, be easily confused with other septic conditions. A coccygeal or pilonidal sinus is a definite clinical entity and is always characterised by one or several minute openings situated accurately in the middle line. It requires careful observation to detect these openings. I have seen them many times in the newbo the adult, and elderly, causing no symptoms whater It is only when they become infected that they give r to trouble, with the resulting secondary sinus lined w granulation tissue.

I venture to suggest to the authors that if they w to restrict their observations to the true pilonidal su and were to take serial microscopic sections of t excised tissue they would in all cases find the epithel lining. Having operated upon a very large series these cases I am confident that the theory I advanc is the true one.

It seems a pity that a paper emanating from t Bland-Sutton Institute of Pathology should make r reference to Sir John Bland-Sutton, that supreme a accurate observer, who in his classic book *Tumo Innocent and Malignant* regarded these sinuses as d to faulty coalescence of the skin. He even suggest they were comparable to the interdigital pouch of t sheep and stated that similar interdigital pouches occ in connexion with webbed fingers in man.

Manchester. **R. L. NEWELL.**

DISTRIBUTION OF DISSEMINATED SCLEROS

SIR,—Disseminated sclerosis is well known to common in some countries (e.g., Switzerland) and ve rare in others (e.g., South Africa). Its incidence var also in different parts of a country, for it is more comm in north than in south Switzerland.

Investigations at present being carried out indica that disseminated sclerosis is relatively common England, and that patients suffering from the disea number 2–4 per 10,000 population. There seem, howeve to be certain parts of the country where it is much mo common than this, and others in which it is rarely, ever, seen.

Information regarding its geographical distribution being collected here for research purposes, and if an doctor can give information regarding its local incidenc or has been impressed by its frequency or rarity in h district, we should be grateful if he would communica with us. Areas of the country where the disease does n occur are just as important as those in which it is frequen

W. RITCHIE RUSSELL.

Radcliffe Infirmary (Neurology), Oxford.

EARLY OVULATION

SIR,—The conclusions that Dr. Sevitt draws in h article of Sept. 28 may be unintentionally misleadin He says: (1) ". . . ovulation can occur on any day the first half of the cycle"; (2) ". . . it appears therefo that premature ovulation is not uncommon"; an (3) ". . . it follows that there is no safe period in th first half of the cycle."

Of his 10 cases there is not one with a normal men strual history. All except 2 are menorrhagias, whic may be due to an endocrine disturbance, as in fact h seems to prove with the sections. The other 2 wer cases of severe leucorrhœa. One of the causes of "func tional" menorrhagia is claimed to be an excessiv development of the secretory endometrium. Dr. Sevi seems to confirm this and even shows that ovulatio seems to occur early in this type of case—i.e., the lute phase lasts longer than the normal 14 days and presu ably gives rise to an abnormally thick endometrium though he has no sections to confirm this.

In case 6 he found an early secretory endometrium during the bleeding phase. I cannot see why he postu lates a new corpus luteum, since the same finding can surely be expected with a persistent corpus luteu or with an incomplete shedding of the endometrium imperfectly stimulated to secretion by the corpus luteu of the previous cycle. In case 9, the only evidence h gives for a "very early secretory phase" is vacuolatio and basal nuclei with some dilated glands of the endo metrium. This change can be produced by a hig œstrogen blood-level in the absence of a functionin corpus luteum, and therefore ovulation.

I feel therefore that the conclusions I have quote can stand only if the words "in some cases of meno rhagia" are added at the end of each.

W. P. HIRSCH.

London, N.W.6.

---

3. Kolff, W. J., Berk, H. T. J. *Acta med. scand.* 1944, 117, 121.
4. Bywaters, E. G. L. *Brit. med. Bull.* 1945, 3, 107.
5. Snapper, I. *J. Amer. med. Ass.* 1946, 131, 251.

Notes and News

NURSERY WORKERS IN SCOTLAND

To ensure a sufficient supply of properly trained workers n nurseries, nursery schools, and children's homes, Mr. Joseph Westwood, Secretary of State for Scotland, has decided to stitute a new course for a nursery nurses' certificate to be warded to girls in nurseries of all types who have followed course of practical and theoretical training and have passed n examination conducted by a Nursery Nurses Examination oard which has just been set up. The course, details of which ill be announced later, will cover two years, and will include ractical work and training in nurseries or nursery schools, nd vocational study and general education. The age-limits ill be 15–25 at the start of training, and candidates will *robably be required to have completed three years in a* econdary school, and to serve for a probationary period efore being accepted. The written part of the first examinaion by the board—to be taken by girls already in training—ill be held on Nov. 16, and the oral and practical part on ec. 3, 1946.

FOR CHILDREN AT TROGEN

The Swiss exhibition of planning and building now open the Royal Institute of British Architects, 66, Portland lace, London, W.1, illustrates a pleasant contribution to nternational understanding in the section of child welfare nd youth service. This is the Pestalozzi children's hamlet t Trogen, Appenzell, where houses have been built on a lovely illside to receive children of various nations. Building is ot yet completed, but in each house 16 homeless children of oth sexes, ranging in age from 3 to 15, will live with foster arents, and some 400 children will be given something like normal home life for several years. Groups of houses will e occupied by children of one nationality, speaking their wn language and keeping their national character, but each group will take part in the central organisation—an international community of children.

The hamlet is voluntarily financed, and school-children and students from Switzerland, France, Holland, and Austria have volunteered to help in building it. The Swiss had much experience during the war in dealing with tens of thousands of refugee children; the hamlet is therefore being founded under happy auspices.

MEDICAL AND DENTAL DEFENCE UNION OF SCOTLAND

The membership of this union has in the past year increased by 279 to a total of 5742. The surplus on the year's working was £727, and the total surplus of assets over liabilities now amounts to £35,048. The union has still further strengthened its position notwithstanding the loss of revenue through the waiving of subscriptions from members in the Forces, who numbered 1883 at the beginning of the financial year. These figures are given in the annual report, which also contains this advice to a member threatened with a claim: (1) to report all the facts to the secretary, and send copies of all records of treatment; (2) to obtain and forward any relevant hospital, X-ray, and other reports; (3) to make no statement which might later be construed as an admission of liability; (4) to send to the secretary, without replying to them, any letters received from patients or their agents in connexion with the case; and (5) not to divulge that he or she is a member of a defence union.

University of Cambridge

Titles of degrees were conferred on the following during the months of August and September:

M.B., B.Chir.—R. S. J. Baker, H. F. Barnes, K. A. C. Bowen, J. E. G. Brieger, F. M. Fountain, J. F. Grant, M. C. Hare, M. Hobson, P. A. Howard, E. G. Howe, G. M. Hunt, H. M. J. Lawn, B. M. Leach, J. Raymond, A. M. Sibly.

University of Sheffield

Dr. R. S. Illingworth has been appointed full-time professor in charge of the new department of child health. It is expected that Dr. Illingworth, who is now assistant to the Nuffield professor of child health in the University of London, will take up his duties in the New Year.

Dr. A. R. Kelsall and Dr. J. Pemberton have been appointed full-time lecturers in medicine.

British Social Hygiene Council

Dr. Fred Grundy, medical officer of health for Luton, has been [illegible] irman of the executive committee in the p[illegible] Otto May.

Royal College of Surgeons of England

A quarterly meeting of the council was held on Oct. 10, with Sir Alfred Webb-Johnson, the president, in the chair. Mr. J. P. H. Davies, of Lewes County School, was admitted as a Macloghlin scholar. Dr. R. J. Last and Mr. H. F. Lunn were appointed anatomical curators.

The council decided to hold an additional primary fellowship examination in January, and an additional final fellowship examination in February, 1947.

Diplomas of membership were granted to P. T. Ballantyne, Hans Dasch, and D. A. Richards.

Diplomas were granted jointly with the Royal College of Physicians to the following candidates:

D.T.M. & H.—C. G. Bree, D. J. Conway, Mudjdeddine Mir-Fakhrai, S. T. Nakib, C. J. A. O'Kelly, A. W. Woodruff.

D.O.M.S.—Solomon Abel, H. Y. Bakro, P. B. Banaji, Edgar Benjacar, W. M. de C. Boxill, Mary Campbell, Prem Chandra, D. G. Cracknell, R. P. Crick, P. R. Day, D. W. Degazon, K. J. L. de Silva, E. F. J. Dunlop, J. D. J. Freeman, A. I. Friedmann, J. G. Gillan, Irene D. R. Gregory, C. D. Gun-Munro, K. J. Higham, J. J. Kennedy, Marian Lones, Edward Lyons, R. L. McKernan, J. M. Mallett, R. M. Mathers, R. C. E. Moffat, Louis Mushin, J. M. G. Nixon, G. N. Pattison, A. J. G. Pullar, K. B. Redmond, H. N. Reed, Edward Riley, C. C. Ring, J. A. Robertson, M. J. Roper-Hall, E. L. N. S. Sack, John Smallpiece, Helen S. C. Smith, A. H. Staples, R. W. Stephenson, Charles Swanston, H. J. R. Thorne, O. R. Todd, H. J. Wales, E. P. Walsh, J. J. Walsh, W. F. Walton.

D.C.H.—Daphne S. A. Anderson, D. C. Arnott, Katharine M. D. Bailey, C. L. Balf, A. C. Blandy, Andrew Bogdanovitch, P. T. Bray, Lorna M. Brierley, Marion Brown, F. R. Buckler, A. E. Buckwold, D. J. Conway, N. J. Cook, Pamela J. Coope, Janet E. W. Copland, P. J. N. Cox, W. H. Craike, Rosemary Davies, Walter Dickson, J. H. Diggle, Margaret D. D. Dudley-Brown, Vera S. Emanuel, G. A. Emmerson, Ethel R. Emslie, Linde E. U. Ewald, Ruth M. Fawcett, A. A. H. Galley, W. H. Galloway, R. E. Glennie, S. G. Hamilton, J. D. L. Hansen, E. W. Hart, Denise O. Henry, Isabella Hood, A. M. Jelliffe, Marion E. Jepson, C. C. Joannides, A. O. John, Cyril Josephs, Nest Kahan, Gwendoline M. E. Keevil, Elizabeth M. Kingsley Pillers, Kathleen M. Lane, Margaret J. Lezema, H. A. Leggett, K. R. Llewellin, Muriel J. Lowe, Patrick Macarthur, Alison D. McDonald, N. R. McEvoy, Mary S. McGladdery, Bessie R. Mackenzie, Douglas McLean, Antoinette M. H. MacMahon, W. J. Matheson, J. B. Mehta, E. W. Miles, Mary Milnthorpe, Enid E. Mitchell, Lucille M. Morgan, J. M. Mounsey, Agnes D. D. Murray, P. J. O'Reilly, B. D. Patel, S. H. Patel, Jean W. Paul, J. D. Pickup, E. M. Poulton, P. J. Preston, Ruth Prothero, L. B. Robinson, Sutcliffe Rattle, Gwladys M. Sewart, Mary D. H. Sheridan, Katherine V. Smith, Helen M. Wagstaffe, H. R. E. Wallis, L. L. R. White, T. K. Whitmore.

D. Phys. Med.—J. H. Crosland, C. R. L. Orme, J. D. Stewart.

Scottish Universities By-election

Colonel Walter Elliot, F.R.C.P., F.R.S., will stand as Unionist candidate in the forthcoming election caused by Sir John Orr's resignation. Colonel Elliot, who is a graduate of Glasgow University, has been Minister of Agriculture (1932–36), Secretary of State for Scotland (1936–38), and Minister of Health (1938–40).

Society for the Relief of Widows and Orphans of Medical Men

At a meeting of the court of directors held on Oct. 9, with Dr. R. A. Young, the president, in the chair, it was stated that in the last half year £1940 had been given to widows in relief. Membership of the society is open to any registered medical man living within twenty miles of Charing Cross. Full particulars may be had from the secretary, 11, Chandos Street, London, W.1.

Empire Rheumatism Council

Mr. Aneurin Bevan and Lord Horder will receive the guests at the reception which is to be held at the Apothecaries' Hall, Black Friars Lane, London, E.C.4, on Monday, Oct. 28, at 4 P.M., to celebrate the tenth anniversary of the foundation of the council. The guests of honour will be Mr. M. G. B. Prytz, the Swedish minister, Prof. J. A. Höjer, chief medical officer of the Royal Swedish health department, and his deputy, Dr. B. Strandell, and Dr. Loring T. Swaim, of the American Rheumatism Association.

Family Allowances

That family allowances are intended to assist in improving the standard of health of the most needy section of the community and must therefore not be reduced for any reason, was the view expressed by the council of the Socialist Medical Association at their recent meeting. At present those receiving special allowances for tuberculosis, workmen's compensation, and other contingencies are liable to have their total income cut by the amount of the family allowance, robbing the latter of all the beneficial effects it was intended to have. The association supports the strong protests being made and asks that family allowances be given as a right and without any reference to the total income.

On Active Service

AWARDS

O.B.E.

Wing-Commander C. W. **COFFEY**, M.R.C.S.
Wing-Commander **DONALD MAGRATH**, M.B. Birm.
Squadron-Leader R. A. **CUMMING**, M.B. Aberd.

M.B.E.

Flight-Lieutenant F. A. **FORBES**, M.B. Aberd.
Flight-Lieutenant **JOHN LILLIE**, M.B. Belf.
Flight-Lieutenant F. W. **PARKE**, B.M. Dubl.
Flight-Lieutenant F. R. **PHILPS**, M.B. Lond.
Flight-Lieutenant W. N. **RILEY**, M.R.C.S.
Flight-Lieutenant W. F. **TIERNEY**, M.B. N.U.I.
Flight-Lieutenant C. B. I. **WILLEY**, M.C., B.M. Oxfd.

The following have been mentioned in despatches:

R.A.M.C.

Brigadiers.—J. P. MacNamara, R. R. Bomford, P. Wiles.

Colonels.—R. A. Anderson, O.B.E., J. D. Driberg, P. J. Stokes, A. B. Dempsey, R. R. Leaning, O.B.E.

Lieut.-Colonels.—P. H. R. Anderson, A. J. Dalzell-Ward, G. T. Ashley, H. L. Ellis, G. J. Evans, P. P. Fox, W. R. N. Friel, W. G. Garrow, W. H. Graham, K. H. Harper, G. C. Hernan, M. S. Holman, C. H. Hoskyn, O.B.E., R. H. Isaac, K. Kumar, D. A. Lowe, G. G. Mer, O.B.E., R. S. Ogborn, R. A. Philp, R. K. Pilcher, M.C., J. R. Squire, H. Stevenson, J. C. Watts, M.C., A. L. Wilson, I. Calvert-Wilson, T. K. Howat, H. L. Wolfe.

Majors.—A. M. Hutton, J. C. Coates, A. Colbert, J. O. Collin, H. W. F. Croft, J. P. Donnel, H. F. Ferguson, A. Gould, E. J. Harrison, R. G. Henderson, J. Hemphill, N. Leitch, P. F. Maguire, A. L. R. Mayer, A. I. McCallum, J. A. McPherson, R. Murray, J. O'Hara, N. C. Porter, J. A. Ritchie, W. T. Walker, M.B.E., G. Wynne-Griffith, K. T. Grey, J. W. Miller, W. G. Mills.

Captains.—R. M. Allan, R. F. Antonio, G. D. G. Barnes, R. H. Bowie, E. G. Dryburgh, R. C. Evans, J. A. S. Forman, C. R. Forrest, P. Fuchs, J. C. Heskith, K. Heslop, L. P. Hodgson, N. B. Jones, S. H. Madden, W. D. Mail, P. L. Masters, S. J. T. Merryfield, C. E. S. Myers, M.B.E., B. A. Protheroe, I. Reubin, A. C. Ritchie, P. R. Robinson, K. R. Urquhart, J. A. K. Wallace, G. L. Whitmore, K. W. Andrews, J. W. Hitchens, F. H. Kelland, G. W. Park, D. H. Rea, A. Smith, R. B. C. Smith, M. W. Stock, W. T. Stone, S. D. Cuthbertson, A. Harrop, A. T. Makin.

Lieutenants.—F. Birch, A. E. Davies, H. Harris, A. I. Hyman, D. I. Jones, J. W. Lewis, G. F. Strickett.

R.A.F.

Squadron-Leader D. A. Duthie.

Flight-Lieutenants.—R. G. Blackledge (deceased), M. H. Kinmonth, L. C. Liddell, J. Simpson, C. B. I. Willey, M.C.

I.A.M.C.

Colonels.—F. R. Cawthorn, O.B.E., B. R. Tandoh, Avyaktanand, M.B.E., D. R. Cattanach, D. K. L. Lindsay, O.B.E.

Lieut.-Colonels.—K. M. Unnikrishnan, G. V. Chaphekar, M.B.E., A. N. De Monte, M.B.E., M.C., G. T. M. Hayes, J. R. Kerr, D.S.O., W. N. Niblock, J. P. O'Riordan, G. A. Ransome, F. W. Snedden, G. B. R. Walkey, J. L. M. Whitbread, B. Bhattacharjya, W. F. J. M. Thom, V. R. Mirajkar.

Majors.—A. H. Vatsyayan, C. R. K. Carroll, A. L. D'Cunha, C. A. Fegredo, F. M. F. Forrest, M. W. Grunstien, F. G. Millar, M. G. Hyder, A. C. Molden, N. U. Khan, Pattanath Shankaran, S. K. Sen, D. S. B. Stephens, U. P. D. Gupta, E. Watson, J. G. Webb, G. S. Dhaliwal, K. L. Chittwal, J. J. D. Lobo, A. S. Reilly, J. H. York.

Captains.—A. K. Bose, B. S. Dhillon, B. N. Chatterjee, B. N. Bali, Brindaban Bakhshi, C. M. Patnaik, C. K. Kurup, C. J. David, C. L. Bahl, V. N. Datar, G. W. D'Sena, D. H. Biswas, G. S. Godiwalla, M. R. G. Aratham, K. Govindarajulu, H. K. Ray, H. B. Parelwali, Husain Reza, J. M. Bose, K. V. G. Kurup, Mohindar Sinjh, Monoranjan Dutt, Mvu Raja, C. P. Nair, M.B.E., N. M. Maitra, Nezamuddin Talukdar, N. S. Ahluwalia, C. M. Patnaik, J. M. Pinto, P. P. Ramadivi, R. N. Dutta, S. P. Ghose, Sarju Prasad, S. K. Mazumdar, Swwan Sinjh, R. M. S. Terry, Thekkepat Karunakaran, P. S. Bhat, B. R. Chaudhuri, D. B. Patnaik, C. R. Peck, Prem Chandra, Rangaraj, N. N. Santhanam, Shrivastava, T. R. Sibramanian, A. K. Mitra.

Lieutenants.—I. A. Khan, J. N. Ghosh, S. J. Mascarenhas.

INFECTIOUS DISEASE IN ENGLAND AND WALE

WEEK ENDED OCT. 5

Notifications.—Smallpox, 0; scarlet fever, 1079; whooping-cough, 1811; diphtheria, 319; paratyphoid, 20; typhoid, 11; measles (excluding rubella), 1781; pneumonia (primary or influenzal), 411; cerebrosp fever, 32; poliomyelitis, 23; polio-encephalitis, 2; encephalitis lethargica, 2; dysentery, 63; puerpera pyrexia, 163; ophthalmia neonatorum, 80. No case o cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Oct. 2 was 839. During the previous week the following cases were admitted: scarlet fever, 56; diphtheria, 28; measles, 17; whooping-cough, 26.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 2 (0) from enteric fevers, 2 (0) from measles, 12 (3) from whooping-cough, 5 (0) from diphtheria, 39 (3) from diarrhœa and enteritis under two years, and 7 (1) from influenza. The figures in parentheses are those for London itself.

Leeds and Oldham each reported 1 death from an enteric fever. Liverpool had 7 fatal cases of diarrhœa and enteritis.

The number of stillbirths notified during the week was 253 (corresponding to a rate of 26 per thousand total births), including 33 in London.

Births, Marriages, and Deaths

BIRTHS

BELL.—On Oct. 11, the wife of Mr. A. C. Bell, F.R.C.S., F.R.C.O.G.—a daughter.

BURKITT.—On Oct. 7, the wife of Dr. Eric Burkitt, of Wimbledon—a son.

DENT.—On Oct. 4, the wife of Dr. Charles Dent—a daughter.

HALLPIKE.—On Oct. 6, in London, the wife of Dr. C. S. Hallpike—a son.

HART.—On Oct. 3, Dr. Bridget Hart (*née* Egan), the wife of Dr J. A. G. Hart, of Londonderry—a son.

HARWARD.—On Oct. 7, at Odiham, Hants, the wife of Dr. R. L Harward—a son.

HICK.—On Oct. 8, at Chippenham, the wife of Dr. A. P. Hick—a son.

LEIGH.—On Oct. 5, at Romsey, the wife of Dr. R. E. Derek Leigh—a son.

MITCHELL.—On Sept. 25, in London, the wife of Dr. Herbert Mitchell—twin sons.

MOLESWORTH.—On Oct. 7, at St. Albans, the wife of Dr. Dav Molesworth—a son.

MORGAN.—On Oct. 6, at Southborough, the wife of Dr. C. R. Morgan—a son.

MOSELHI.—On Oct. 5, at Carlisle, the wife of Dr. A. Moselhi—a daughter.

MOYNAGH.—On Oct. 4, at Bristol, the wife of Dr. Kenneth Moynagh—a son.

NOBLE.—On Oct. 3, the wife of Dr. Andrew Noble, Stonehaven—a son.

REILLY.—On Oct. 9, in London, the wife of Dr. M. C. T. Reilly—a daughter.

SCADDING.—On Oct. 12, in London, the wife of Dr. J. G. Scadding—a daughter.

SCHOFIELD.—On Oct. 4, at Harpenden, the wife of Dr. Theodore T. Schofield—a son.

SMYTH.—On Sept. 28, at Dublin, the wife of Lieut.-Colonel S. Smyth, I.M.S.—a son.

WOOLF.—On Oct. 5, at Edinburgh, Dr. Cecil Mary Drillien, wife of Mr. Barnet Woolf—a daughter.

MARRIAGES

CALDER—HERRIOT.—On Oct. 1, at Glasgow, Francis Robert Murray Calder, M.B., to Janet Whitson Herriot, M.B., captain R.A.M.C.

KONSTAM—RITCHIE.—On Oct. 12, at Alford, Aberdeenshire, Peter G. Konstam, F.R.C.S.E., lieutenant R.A.M.C., to She T. Ritchie, M.B.

O'NEILL—PEARSON.—On Sept. 30, in London, Desmond Fran O'Neill, M.C., M.B., to Ruth Mary Pearson.

ROCHE—HARDY.—On Oct. 4, in London, James Wallace Roche, M.B., to Margaret Joan Hardy.

WALTON—TRUMP.—On Sept. 21, at Salcombe Regis, Richard Walton, surgeon lieut.-commander R.N.Z.N.V.R., to Barbara Trump.

DEATHS

BAKER.—On Oct. 10, Arthur Ernest Baker, M.R.C.S., L.D.S., of Bromley, Kent, aged 83.

BEARD.—On Oct. 12, at Epsom, Frederic Beard, M.B. Camb., aged 84.

BRIGGS.—On Oct. 7, at Wigston, Christopher Duffield Briggs, M.R.C.S.

HARDWICK SMITH.—On Oct. 6, at Wellington, New Zealand, Henry Hardwick Smith, F.R.C.S.

HARVEY.—On Oct. 7, Willoughby Henwood Harvey, M.A. Camb., M.D. Toronto, of Cambridge, aged 65.

JACKSON.—On Oct. 8, Henry Beecher Jackson, M.A. Camb., M.R.C.S., aged 67.

MYERS.—On Oct. 12, Charles Samuel Myers, O.B.E., M.D., SC.D. Camb., F.R.S., of Minehead, aged 73.

RIPPON.—On Oct. 4, in London, Thomas Stanley Rippon, O.B.E., M.R.C.S., late wing-commander R.A.F.

ROYSTON.—On Oct. 6, at Moordown, Bournemouth, Charles James Royston, M.B. Aberd., aged 46.

CORONARY DISEASE

THE HARVEIAN ORATION OF 1946 *

Sir MAURICE CASSIDY
K.C.V.O., C.B., M.D. Camb., F.R.C.P.
PHYSICIAN TO H.M. THE KING; CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL, LONDON

HARVEY was one of the first, and perhaps the most amous, of the experimental physiologists; certainly he s the most venerated. Even after the lapse of three undred years our admiration for his genius is mingled ith affection engendered by the many endearing facets f his character. His operative technique was of necessity omewhat crude. For instance, in the introduction to *De Motu Cordis* he refers to Galen's experiment:

> "An artery having been exposed is opened longitudinally and a reed, or other pervious tube, is inserted into the vessel through the opening, and the wound is closed."

Harvey comments:

> "I have never performed this experiment of Galen, nor do I think it could very well be performed in the living body, on account of the profuse flow of blood that would take place from the vessel which was operated on."

In the second disquisition to Riolan, however, Harvey describes the performance of this operation and notes obscure pulsation of the artery distal to the "pervious tube," and that blood escapes in spurts from this distal portion on section of it. But he goes on to lament that "the effusion of blood from the wound confuses everything, and renders the whole experiment unsatisfactory and nugatory." When watching Dr. Crafoord, of Stockholm, excise an aortic coarctation, and perform the almost incredible feat of effecting an end-to-end anastomosis of the thoracic aorta above and below the coarctation (Crafoord and Nylin 1945), I thought how delighted Harvey would have been with this triumph of modern surgery. He would also have shared with us our admiration of the skill which enables the surgeon of to-day to undertake the ligation of the patent ductus arteriosus with little more trepidation than before appendicectomy. He would have joined with us in congratulating Blalock, who successfully anastomoses the innominate or the subclavian artery with the right or left pulmonary artery (Blalock and Taussig 1945), and thus relieves some of the inconveniences of Fallot's tetralogy.

Harvey would surely have appreciated splanchnic sympathetic resection as an interesting physiological experiment, and would, like us, have been delighted to hear that the extensive lumbodorsal splanchnic resection devised by Smithwick (1944) can rob essential hypertension of much of its terror, for some years at any rate. But perhaps Harvey's admiration would be tinged with a little not unnatural envy were he to witness the work of his successors in the field of experimental animal surgery —the work, for instance, of Murray, Wilkinson, and Macgregor (1938), of Toronto, who excise a portion of the mitral valve and repair it with a strip of external jugular vein, with complete recovery of the animal. What would Harvey have thought of Cutler's cardiovalvulotome, or of cardiac endoscopy as practised by Harken and Glidden (1943)? Who can doubt that before long the surgical treatment of valvular stenosis in man will become a justifiable and successful operation?

I have to confess that I have had neither the opportunity nor the aptitude to obey Harvey's injunction "to search and study out the secrets of nature by way of experiment," except so far as every clinician experiments in a desultory sort of way in respect of treatment. But at last we physicians are beginning to recognise the value of controlled, as opposed to haphazard, experimental treatment. The brilliant results of the treatment of bacterial endocarditis with penicillin under the ægis of Prof. R. V. Christie and his committee would not have been achieved so quickly or so successfully on the old haphazard lines.

PREVALENCE OF CORONARY DISEASE

For many years I have been especially interested in cardiology, and I have been impressed, like many others, by the increasing prevalence of coronary disease. Even during so short a period as the last twenty years this increasing prevalence seems to be beyond question. In the year 1926, 64,465 persons died in this country of all forms of heart disease. Ten years later this number was almost doubled, 126,584 to be exact. The figures for coronary disease are even more startling: 1880 died in 1926; 14,095 in 1936; and 19,496 in 1939. The crude death-rate from all causes per 1000 persons living fell from 22 in the decade 1851–60 to 12 in 1930, and has subsequently remained almost stationary at about that figure. The similar crude death-rate from heart disease, and particularly from coronary disease, has risen in a spectacular fashion during this period, especially during the last twenty years. In the case of coronary disease the figures increase rapidly year by year: 48 per million living in 1926; 148 in 1930; 473 in 1939.

Part of this rapidly increasing death-rate from coronary disease is no doubt attributable to the increasing age of the population. In 1900 there were 1,750,000 persons over 65 years of age in Great Britain; in 1937 there were over 3,750,000 (Dudley Committee 1944). It is true that the standardised death-rate, corrected for ageing, for policy holders of the Metropolitan Life Insurance Company (1946), of New York, shows a 70% decline for diseases of heart, arteries, and kidneys in 1940–45 compared with 1911–15. But this astonishing decline in mortality is for ages 1–74. When the figures for the different age-groups are examined, it is clear that the improved mortality affects chiefly persons up to the age of 25, and is no doubt attributable, in part at least, to more efficient treatment of the acute infections which are largely responsible for cardiovascular and renal deaths in this lower age-group. Between the ages 35 and 64 the standardised mortality among men shows little or no decline in the past two decades, and there is in fact an increased mortality now compared with the level reached in the early nineteen-twenties.

The crude death-rates in America, without correction for increasing age of population, have increased as they have done in this country; thirty-five years ago cardiovascular diseases accounted for less than a quarter of all deaths. Now they account for nearly half.

Part of this mounting coronary mortality has been ascribed by some to increasing accuracy of certification. But I cannot believe that increasing accuracy of certification can play a very important part. The position here is very different from that in such a disease as bronchial carcinoma, for example, where accurate diagnosis largely depends on refinements of investigation, such as are afforded by bronchoscopy and radiography. Angina pectoris is one of the easiest of all diseases to recognise. Its clinical features have been well known to every doctor since Heberden recounted them before this college in 1768. In most cases of angina pectoris electrocardiographic and radiographic investigations are superfluous aids to diagnosis.

Certainly the clinical recognition of coronary thrombosis has till recently been hidden from us. Though first well described clinically by Herrick (1912), its diagnosis did not become widespread in America till about 1920. Curiously enough it was not until 1925 that McNee brought to the notice of physicians in this country the clinical picture of coronary thrombosis as first described by the American cardiologists, and the rapid increase in the certification of deaths from coronary thrombosis since that date must be partly attributable to this. Even so, I have the impression that coronary thrombosis is

---

* Delivered before the Royal College of Physicians of London on Oct. 18.

Biochemical Society

A joint discussion on Quantitative Biochemical Analysis by Microbiological Response will be held by the Biochemical Society and the Society for General Microbiology at the London School of Hygiene, Keppel Street, London, W.C.1, on Saturday, Nov. 2, at 11.15 A.M.

Course on Diseases of the Chest

A course of lectures and demonstrations will be held at the London Chest Hospital, Victoria Park, E.2, on Fridays at 5 P.M., from November till March. Those to be given this year are: Nov. 1, Dr. S. Roodhouse Gloyne, Industrial Diseases of the Lung; Nov. 8, Mr. S. C. Suggit, Carcinoma of the Larynx and Pharynx; Nov. 15, Dr. Shirley Smith, the Heart in Pulmonary Disease; Nov. 22, Mr. Holmes Sellors, Surgery of the Heart; Nov. 29, Dr. J. R. B. Hern, Asthma; Dec. 6, Dr. Browning Alexander, Consideration of Diagnosis and Treatment of Lung Abscess; Dec. 13, Dr. Franklin Wood, Recent Advances in the Radiology of Lungs.

Field Marshal Montgomery on Morale

The Lloyd Roberts lecture will be delivered at the Royal Society of Medicine on Monday, Oct. 28, at 3 P.M., by Field Marshal Viscount Montgomery. His subject is to be Morale, with Particular Reference to the British Soldier.

At a scientific reunion of the Société Internationale de Chirurgie Orthopédique et de Traumatologie in Brussels on Oct. 3 and 4, Prof. Louis Ombrédanne was re-elected president, and Dr. Jean Delchef secretary-general; Prof. Harry Platt and Dr. San Ricart were elected vice-presidents; and Dr. Henry Meyerding, of the Mayo Clinic, was elected president of the next congress, which will be held in Amsterdam in September, 1948.

Medical Diary

OCT. 20 TO 26

Monday, 21st

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. Harry Platt: Localised Cystic Disease of Bone.

Tuesday, 22nd

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. Geoffrey Keynes: Surgery of the Anterior Mediastinum.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Medicine.* Dr. Maurice Davidson: Judgment in Medicine. (Presidential address.)
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. W. J. O'Donovan: Psychosomatic Dermatoses.

Wednesday, 23rd

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. A. C. Palmer: Ætiology, Symptoms, and Treatment of Procidentia.
ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Endocrinology.* Mr. L. R. Broster, Dr. E. F. Scowen, Dr. F. L. Warren: Over-activity of the Adrenal Cortex.
RESEARCH DEFENCE SOCIETY
3.15 P.M. (26, Portland Place, W.1.) Prof. N. Hamilton Fairley, F.R.S.: War-time Research in Malaria and other Tropical Diseases of Military Significance. (Stephen Paget lecture.)

Thursday, 24th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. W. B. Gabriel: Causation and Treatment of Anal Incontinence.
ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Mr. R. H. O. B. Robinson: Problems of Renal Lithiasis. (Presidential address.)
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. G. Duckworth: Virus Diseases of the Skin.
MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Mr. L. Le Marchant Minty, PH.D.: Legal Aid to Assisted Persons.

Friday, 25th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. R. C. Brock: Surgery of Lung Abscess.
ROYAL SOCIETY OF MEDICINE
2.30 P.M. *Epidemiology and State Medicine.* Brigadier Tom Kennedy, Colonel Horsburgh, Colonel H. A. Raeburn: Health Problems in Germany.
5 P.M. *Pædiatrics.* Professor Debono: Kala-azar in Infancy.
ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Major-General P. H. Mitchiner: Aftermath of War in Medicine.

Saturday, 26th

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.1
2.30 P.M. Dr. F. R. Curtis: Venereal Disease in Occupied Germany.

Appointments

GOVAN, A. D. T., M.B. Glasg., PH.D. Birm., F.R.F.P.S.: director of research, Glasgow Royal Maternity and Women's Hospital.
GRIERSON, A. M. M., M.B. Edin., D.P.H.: deputy medical officer of health, City of Manchester.
HARTLEY, J. B., M.D. Durh., F.F.R., D.M.R.E.: radiologist (diagnostic department), Christie Hospital and Holt Radi Institute, Manchester.
LINDAHL, J. W. S. H., M.CHIR. Camb., F.R.C.S.: second laryngologist, King Edward Memorial Hospital, Ealing.
MAIN, T. F., M.D. Durh., D.P.M.: medical director, Cassel Hospital for Functional Nervous Disorders, Stoke-on-Trent.
PERCIVAL, R. C., F.R.C.S., M.R.C.O.G.: gynæcological surgeon, King George Hospital, Ilford.
WARIN, J. F., M.D. Leeds, D.P.H.: deputy medical officer of health, City of Leeds.

Guy's Hospital, London:
BAKER, C. G., O.B.E., M.D. Lond., M.R.C.P.: assistant physician.
BLACKBURN, GUY, M.B.E., M.CHIR. Camb., F.R.C.S.: assistant surgeon.
CRISP, E. J., M.B. Camb.: physician in charge of physiotherapy department.
DREW, A. J., F.R.C.S.: surgical registrar.
EVANS, P. R. C., M.D., M.SC. Lond., F.R.C.P.: director of the department of child health and physician to children's department.
HILLS, T. H., M.B. Lond., D.M.R.E.: director of department of diagnostic radiology.
HORTON, R. E., M.B. Lond.: surgical registrar.
KENSHOLE, H. H., D.S.O., T.D., M.R.C.S., L.D.S.: assistant dental surgeon.
KESSON, C. W., M.R.C.P.: children's registrar.
LILWALL, B. G. A., F.R.C.S.: surgical registrar.
NICHOLAS, C. P., F.R.C.S.: surgical registrar.
PRINGLE, K. E., L.D.S. R.C.S.: assistant dental surgeon in children's department.
RIPMAN, H. A., M.B. Lond., D.R.C.O.G.: obstetric registrar.

Royal Waterloo Hospital for Children and Women:
ANSON, B., M.R.C.S., D.A.: anæsthetist.
ARMSTRONG, J. R., F.R.C.S.: orthopædic surgeon.
BAYNES, T. L. S., M.D. Lond., F.R.C.S.: gynæcological registrar.
BLACKBURN, F. H., M.B. Durh., M.R.C.S., D.A.: anæsthetist.
BLOOM, ROSS, F.R.C.S.: surgical registrar.
BRADDON, I. G., M.R.C.S., D.A.: anæsthetist.
EXNER, G., L.D.S. R.C.S.: dental surgeon.
LANCKENAU, N. I., M.D. Lond.: physician in charge of physical medicine.
MYERS, G., F.R.C.S.: surgical registrar.
SPIERS, B. G., F.R.C.S., M.R.C.O.G.: gynæcological registrar.
WIGODER, L., M.B. Dubl., M.D.S.: dental surgeon.

Royal Sussex County Hospital:
ALLEN, T. S., F.R.C.S.E.: ear, nose, and throat surgeon.
BINNING, REX, M.R.C.S.: anæsthetist.
BOURNE, W. A., M.D. Camb., M.R.C.P.: physician.
CRAWFORD, J. H., M.R.C.S.: anæsthetist.
DOWNER, H. G., M.B. Melb., D.L.O.: ear, nose, and throat surgeon.
FORRESTER-WOOD, W. R., F.R.C.S.: surgeon.
FRASER, G. A., M.B. Edin., D.L.O.: assistant ear, nose, and throat surgeon.
JONES, E. C., M.B. Lond., M.R.C.S.: assistant dermatologist.
MCCURRICH, H. J., M.S. Lond., F.R.C.S., M.R.C.O.G.: surgeon.
MCGREGOR, H. G., M.D. Lond., M.R.C.P.: physician.
MILLINGTON, E., M.R.C.S., D.M.R.: radiotherapist.
PRICE, R. K., M.D. Lond., M.R.C.P.: physician.
WATT, A. W., M.B. Glasg., D.P.M.: psychiatrist.
WAUCHOPE, GLADYS M., M.D. Lond., F.R.C.P.: consulting physician.
WILLIAMSON, J. C. F. L., F.R.C.S., M.D. Camb.: assistant surgeon.

Warwickshire Hospitals Council:
BERRILL, T. H., M.B. Brist., F.R.C.S.: visiting general surgeon.
WATSON, A. J., M.B. Lond., F.R.C.S.: director of accident and fracture services.

Oldham Royal Infirmary:
DAVIES, J. H. T., M.B. Camb.: visiting dermatologist.
HESLOP, J. F., M.B. Manc., F.R.C.S.: visiting genito-urinary surgeon.
JELLY, G. O., B.M. Oxfd, M.R.C.P., F.R.C.S.: visiting surgeon.
KENYON, A. L., B.SC., M.B. Manc., F.R.C.S.: visiting surgeon.
MURRAY, A. R., M.B. Edin., F.R.C.S.: first assistant to orthopædic and accident service.
NICHOLSON, W. F., M.A., M.D., M.CHIR. Camb., F.R.C.S.: visiting thoracic surgeon.
NISH, J. N., M.B. Melb., F.R.C.S.: orthopædic surgeon.
RACKER, D. C., M.B. Manc., M.R.C.O.G., F.R.C.S.E.: visiting gynæcologist.
RICHARDSON, A. H., O.B.E., M.R.C.S., D.M.R.: visiting radiologist.
SMITH, V. T., M.D. Manc., F.R.F.P.S.: visiting ear, nose, and throat surgeon.
SYKES, R., B.SC., M.D. Lond., M.R.C.P.: visiting physician.
TAYLOR, W. V., M.B. Lond., D.M.R.: assistant radiologist.

Swansea General and Eye Hospital:
BOWEN, J. G., M.B. Lond., F.R.C.S.: assistant surgeon.
BOYLE, H. H., H.D.D. & L.D.S. Glasg., H.D.D. Edin.: surgeon dentist.
CELLAN-JONES, C. J., M.D. Durh., F.R.C.S.E.: surgeon.
DAVIES, V. J., M.D. Lond., F.R.C.S.E., D.R.C.O.G.: gynæcologist.
EVANS, I. Q., F.R.C.S.E.: assistant surgeon.
HOWELL, H. W., M.D. Lond., M.R.C.P.: assistant physician.
JONES, D. S., L.M.S.S.A., D.A.: anæsthetist.
JONES, G. W., M.R.C.S.: assistant radiologist.
JONES, W. H., M.B. Wales: anæsthetist.
MACLEAN, W., M.D. Manitoba, F.R.C.S.E.: surgeon.
MORGAN, J. O., L.D.S. R.C.S.: surgeon dentist.
TANNER, C. H., M.B. Lond., F.R.C.S.: assistant surgeon.
THOMAS, I. J., B.S. Lond., F.R.C.S., F.R.C.S.E.: assistant gynæcologist.

today no-one would contend that men work four times as hard as women; in fact some might argue that the reverse is true. I have not been able to satisfy myself that the incidence of angina on women has increased of recent years compared with that on males. If smoking plays an important part in the causation of coronary disease, which I doubt, we should certainly expect a more equal sex-incidence during the next ten years or so.

Nor is there any satisfactory explanation of the unquestionably heavier incidence of coronary disease on the non-hospital as opposed to the hospital population.

Age-incidence.—My figures are much the same as those of the Mayo Clinic:

Age	Under 30	30–40	40–50	50–60	60–70	70–80	80
Females ..	0	1·3%	11·7%	29%	39%	15%	4%
Males ..	0·2%	3·2%	14·0%	33·9%	36%	11·1%	1%

About 70% of all patients were aged between 50 and 70 at the onset; 58% of women and 48% of men were over 60 at onset, which confirms the general impression that coronary disease tends to become manifest at a later age in women than in men. In 26 males the age at onset was under 40, in 2 under 30, the youngest being 26. There were only 3 women under 40 and none under 30.

It has become evident that coronary disease in young subjects is not so rare as used to be thought. French and Dock (1944) have reported 80 cases of coronary disease in American soldiers aged 20–36 during the recent war, and Newman (1946), in this country, 50 cases of coronary occlusion in Service men and women, aged 25 or less. Of Newman's patients 22 were under 30, the youngest aged 20. At autopsy atheromatous changes were found, in several instances accompanied by extensive calcification.

Stolkind (1928) reported 4 personal cases of angina in children and collected a further 25 cases from the literature. Many of these cases were in rheumatic children, and in some the evidence of angina was not very convincing.

Family history plays a notorious part in the ætiology of cardiovascular disease, and it did so in almost exactly half my cases. But this leaves another 50% of patients whose coronary disease cannot be attributed to inheritance.

Stress.—Mental or physical stress is often thought to be responsible for early cardiovascular death, and coronary disease has been brought into the ever-increasing ambit of psychosomatic disease (Halliday 1945). But does the population really work harder or live more strenuous lives than their grandfathers did? I sometimes doubt it. Certainly we eat and drink much less than they did. I have looked carefully through the histories of my patients, and in only 20% of them do I find evidence of subjection to outstanding stresses. Many of them in fact seem to have lived remarkably placid and sheltered lives. Dr. Paul White, of Boston, on a recent visit to this country told us that in the first edition of his book *Heart Disease* a sentence emphasising the relationship between angina and stress was in italics, in the second edition in ordinary print, and in the third deleted.

Nor am I familiar with the "coronary-disease personality," as described at some length by Arlow (1945):

> "A stubborn self-willed child who early entered into competitive relationship with a much feared and envied parent; the conflict is repressed and identification made with the parent. . . . He attempts to equal his superiors, to surpass and dominate others. A masochistic trend may be noted in the manner in which these patients neglect themselves and make themselves martyrs to their own ideals. . . . The compulsive striving for achievement and mastery never seems to end. Success brings no gratification nor release from tension."

Tobacco has long been thought to be a factor in the causation of arterial spasm, and there seems to be convincing experimental evidence of this. Numerous workers—e.g., Stewart et al. (1945), Evans and Stewart (1943), and Roth et al. (1944)—have demonstrated that the smoking of two cigarettes usually lowers the peripheral skin temperature, diminishes the peripheral blood-flow, and raises the systolic, and still more the diastolic, blood-pressure. It is said that these changes may be evident not only during the smoking of the cigarettes but also sometimes for as long as 30 minutes subsequently. This is depressing information to the smoker, but he will be encouraged to hear from Goetz (1942) that very similar results are obtained if the subject is alarmed, or asked to do a difficult sum, or even to take a series of deep breaths. Goetz concludes that the driving of a car in traffic would produce more adverse circulatory effects than the smoking of several cigarettes in an armchair at the club.

I always advise sufferers from intermittent claudication to stop smoking, and usually this brings no amelioration of their symptoms. But very occasionally the results are dramatic, and I have seen a relapse if smoking is resumed. So far as so-called "tobacco angina" is concerned, I have never encountered such a condition, and certainly I have never seen angina cured by stopping smoking. Statistically 17·6% of my coronary patients were non-smokers, 42·6% smoked moderately—i.e., not more than twenty cigarettes a day—and 39·8% were heavy smokers. As a control I investigated the smoking habits of a small series of non-cardiac cases, and found much the same figures.

PROGNOSIS

Coronary disease persisted more than twenty years in 11 of my patients, more than thirty years in 2 of them. The record duration was fifty-two years, in a lady who had her first attack of angina at the age of 30; she was leading a busy life at the age of 80, though still liable to angina whenever she walked. She died suddenly at the age of 82.

It has long been known that quite extensive coronary disease is compatible with an active life and need not necessarily be associated with angina. In fact this used to be put forward as an argument against the view that angina is due to coronary ischæmia. Coronary occlusion often antedates angina. It did so in 225 (22·5%) of my cases. Yet before coronary occlusion can occur there must almost always be coronary disease. Moreover, a remarkably complete functional recovery is possible after a coronary occlusion. One of my patients played vigorous games after a coronary occlusion at the age of 39. He had a second attack at the age of 48, and, against advice, was playing tennis regularly two years later, without any angina. Now at the age of 58 he is at work, plays golf, and mows his lawn without cardiac symptoms.

It is common for coronary disease to be entirely latent till sudden death takes place. Professor Hume, of Newcastle, tells me that since 1911 he has performed or attended post-mortem examinations on 160 miners who had died suddenly and unexpectedly in the pit or in close proximity to it. The cause of death in each instance was coronary atheroma, and most of the men had been working regularly, without complaint, up to the moment of their fatal collapse. Only 40 had premonitory symptoms. In 1 case there was a clear history of an attack of coronary thrombosis two years previously, after which the man had resumed his normal work in the mine and continued it till his sudden death. In about half the 160 cases there were old fibrotic scars in the heart muscle.

The explanation of coronary disease without symptoms is presumably that a wonderfully efficient collateral circulation may be formed if arterial obstruction develops sufficiently slowly. As Lowe and Wartman (1944) point out:

> "Complete obstruction may, gradually produced, effect no disturbance whatever in the blood-supply to the tissue. On the other hand, should the parent vessel supplying the anastomotic circulation become suddenly blocked, the

far more prevalent than it was. Looking through my notes of patients seen twenty or thirty years ago, I come across occasional cases where I failed to recognise the coronary thrombosis, which now, on paper, is the obvious diagnosis. But such cases are surprisingly few. It is interesting to read now James Mackenzie's notes of case 112, one of the 160 case-records in his book on *Angina Pectoris* (1923). He describes this as " one of the most puzzling cases I have met." It is now evident to us that this patient had at least two attacks of coronary infarction, the second associated with pericardial friction, and that six months later the consequent myocardial degeneration brought on three attacks of acute pulmonary œdema, the last fatal.

It is odd, too, that coronary thrombosis figures so seldom in the post-mortem reports of thirty years ago, despite the fact that the very astute morbid anatomists of those days were fully alive to the existence of this condition.

Consider, too, the clinical experience of great physicians of the past. Mackenzie (1923) states that " 380 patients consulted me for angina pectoris." Osler (1910) says:

> " It is a disease for seniors to discuss, since juniors see it but rarely; indeed I had reached the Fellowship before I saw a case in hospital or in private practice. During ten years I did not see a case at the Montreal General Hospital, and only one case at the University Hospital, Philadelphia. . . . A consultant in active practice may see 10, 15, or more cases in the course of a year, and this is about the figure reached in this country by a consultant with recognised cardiovascular leanings."

He goes on to say that he has now seen 268 cases, which included 42 " of the mild neurotic or pseudo form." Contrast these figures with those of the modern cardiologist, who counts his coronary patients by thousands rather than by hundreds, and remember that *there was but one James Mackenzie, and one William* Osler, whereas the modern cardiologist's name is legion! During the ten years 1898–1908 Sir Richard Douglas Powell (1909) saw 96 cases of angina, 26 of which he classified as vasomotor angina. Surely Osler, Mackenzie, and Douglas Powell were at least as competent to diagnose angina pectoris as are physicians of this generation.

DIAGNOSIS

What is the explanation of the increasing prevalence of coronary disease? In an attempt, and I confess at once a vain one, to find some answer to this question I have analysed the notes of 1000 cases of coronary disease, including both coronary occlusion and angina pectoris, seen in consulting practice. I have notes of approximately another 1000 cases which I have not analysed. I was careful to include only those cases where I was reasonably certain that coronary disease was present. And here may I put in a plea for the abandonment of such terms as angina minor, angina innocens, and (worst of all) pseudo-angina? Either the patient has angina—or he has not. If he has, we believe that some portion of his myocardium is ischæmic, usually as a result of coronary atherosclerosis, with or without a coronary thrombosis or a subintimal hæmatoma. Syphilis is a rare cause of true anginal pain, and embolism a rarer cause still. A severe anæmia may play a part, probably in association with some degree of coronary atherosclerosis, for I have never seen a severe anæmia cause angina in a young subject, though this happens commonly in the more elderly. Alastair Hunter (1946), however, has described 12 cases of anæmic angina, of which 10 were in women, and 5 in persons aged 40 or less, the youngest being 31, which certainly suggests that anæmia alone may cause anginal pain.

Anginal pain is sometimes a symptom of rheumatic heart disease, but I have not included such cases in my series, because in my experience they do not conform to the clinical picture of the atherosclerotic type, though we know that rheumatic infection may produce somewhat similar coronary changes (Karsner and Bayless 1934). I have never seen a coronary occlusion complicating rheumatic heart disease, nor do I feel that anginal pain in a young rheumatic subject has the same serious significance as in the atherosclerotic patient.

We can conceive of the possibility of spasm of a healthy coronary artery producing a localised myocardial ischæmia with consequent coronary pain; but we have no proof that this does in fact ever happen, though we may suspect that an unstable vasomotor control may play a part in the clinical picture of the patient, familiar to us all, who suffers, perhaps for years, from anginal paroxysms of great severity, provoked by trivial physical effort, and especially by emotion. Findings on physical examination may be surprisingly negative; and consequently these patients are often regarded as cardiac neuropaths till at last the diagnosis of organic coronary disease becomes only too clear, perhaps as a result of the sudden and unexpected death of the patient.

Some years ago I used to diagnose " vasomotor angina " not infrequently in patients who complained of pain of typical distribution, this pain being provoked y effort, but especially by emotion, without physical of organic cardiovascular disease and with a normal electrocardiogram. Sometimes there was evidence of vasomotor instability, such as easy flushing, or Raynaud-like phenomena, or a history of migraine. But increasing experience has convinced me that sooner or later these patients present undoubted evidence of organic coronary disease. If the same amount of effort constantly provokes substernal pain or even discomfort, however slight, and if this discomfort disappears promptly with rest, I think we may assume with confidence some degree of coronary obstruction, however negative the findings may be.

As for that large heterogeneous group of so-called false angina, we can only speculate as to the explanation of their pain, feeling assured that it is not of coronary origin. Many of them are suffering from a cardiac anxiety state. There is an interesting, and sometimes a diagnostically difficult, group of patients, usually women, who have severe paroxysms of precordial, usually not sternal, pain, which may radiate into the arms, back, or jaws. These paroxysms may be provoked by emotion, or there may be no obvious exciting cause. They come after, rather than during, effort, and they are usually widely spaced, with periods of robust health, without limitation of physical effort, between them. The subjects of these attacks, though sometimes temperamental, are often quite stable psychologically. Their symptoms are very real and severe, and may indeed be alarming. Possibly these paroxysms may be due to spasm of the œsophagus or of the cardiac sphincter. Radiological confirmation of this is obviously difficult to obtain, though I understand that William Evans has made some interesting kymographic observations in this class of case. Diagnosis is made more difficult here by the fact that nitroglycerin gives relief; but perhaps it does so by relaxing gastric or œsophageal and not coronary spasm.

I submit that in the differential diagnosis betwe true angina and these non-coronary pains, careful history-taking is even more important than physical, including instrumental, examination, and that the *characteristic and constant* relationship between anginal pain and effort is fundamental.

ÆTIOLOGY

Sex-incidence.—Turning now to my own statistic out of 1000 patients, 779 were males, 221 females, givi a female-to-male ratio of 1 to 3·5, which seems to be abo the usual ratio found in the literature, though in recent report from the Mayo Clinic on 3440 angin patients the female-to-male ratio was 1 to 4·3 (Parker al. 1940). This far heavier incidence of angina on mal rather than on females has never, so far as I know received a satisfactory explanation. In the past n doubt women led a more sheltered life. But certainl

ABLE I—FREQUENCY DISTRIBUTION OF ELEVATION OF SERUM-PROTEIN LEVEL BY 15 MIN. WALKING, CALCULATED FROM SERUM SP. GR. AT 0 AND 60 MIN. AFTER EXERCISE

Serum-protein (g./100 ml.)	Below	Above resting level								Total cases	Elevation	
	0·18	0	0·18	0·36	0·54	0·72	0·90	1·08	1·26		Mean	S.D.
Recruits	6	12	29	31	23	6	4	—	1	112	0·33	0·2623
Trained soldiers ..	2	3	17	11	4	4	1	—	—	42	0·30	0·2375

The subjects belonged to a Madrasi Pioneer Battalion and were either recruits with less than a month's service or trained soldiers (mostly junior N.C.O.s) with over a year's service. The recruits' mean height was 63 in., S.D. 1·92 in., and mean weight 102 lb., S.D. 8·51 lb. The mean gain in weight of a recruit during six months' training is about 10 lb. All the men were aged 18–30, and most of them about 20.

METHOD OF INVESTIGATION

The men rose at dawn, 7 A.M., had a light breakfast of tea and chapattis (unleavened bread) at 7.30 A.M., walked to the laboratory, and rested until 8.30 A.M., when the experiment began.

Exercise consisted of either marching or pack test. For marching the men wore shirts, shorts, and chaplis (sandals). They marched on flat ground at the normal army pace for 15 min. For the pack test they wore shirts, shorts, and Army boots, and carried a third of their own weight in a pack. They mounted a 15-in. step (both feet up) thirty times a minute for 5 min., or for a shorter time until they were completely exhausted. They then sat down for $4^1/_2$ min. while the pulse-rate was counted. Few men took the full thirty steps a minute, but even so this was a most severe test. As each man completed his prescribed exercise he walked a few yards into the laboratory and squatted on the floor (sepoys are not comfortable on chairs). He remained in the same place until the observations were completed.

Venepuncture.—Blood was taken from an arm vein with a syringe sterilised with hot liquid paraffin. No tourniquet was used, but if necessary the veins were made prominent by the pressure of a hand not exceeding 10 sec. Blood for serum (3 ml.) was allowed to clot in a sloped position; the serum was withdrawn and its sp. gr. determined after 4–6 hours. Blood for hæmoglobin and hæmatocrit determinations (2·5 ml.) was mixed with Wintrobe's dry anticoagulant (Whitby and Britton 1942), and the hæmoglobin pipette and hæmatocrit were immediately filled before sedimentation began.

Specific Gravity of Serum.—This was determined by Van Slyke's copper-sulphate method (Phillips et al. 1945). The stock solution was made by dissolving 170 g. of $CuSO_4.5H_2O$ in 1002·4 g. of water, and the standard solutions were made by dilution of this stock. The sp. gr. of the stock solution and of a standard solution (usually 1028) were checked by weighing.

For the sake of clarity in our calculations and tables we use the notation 1000 (not 1·0) for the sp. gr. of water. Our standard solutions were 1 unit apart in this notation—i.e., 1020, 1021, &c.—and we estimated the sp. gr. of the serum to the nearest 0·5.

We renewed a standard solution when about a fiftieth of its volume of serum had been added. According to Phillips et al. (1945) the sp. gr. of the solution at this time would be decreased by about 0·4; hence the mean sp. gr. of our solutions during their life was about 0·2 below their initial value. We have made no allowance for this rather variable error in the sp. gr. figures given in this paper.

In calculating mean serum-protein levels we have tried to allow for the degradation of our solutions by using a modification of van Slyke's formula:

$$\text{Serum-protein} = (\text{serum sp. gr.} - 1007{\cdot}2) \times 0{\cdot}36.$$

Hæmoglobinometry.—Blood 0·02 ml. was mixed in N/10 HCl 0·4 ml., allowed to stand for 80 min., diluted to 1·59 ml. with distilled water, and matched against the glass wedge of the Zeiss hæmometer. The standardisation of this instrument has been described elsewhere (Hynes et al. 1945, 1946). The standard error of a single reading is ±0·16 g. of hæmoglobin. When two hæmoglobin determinations were made on the same person, the same pipette and dilution tube were used on each occasion, and the same worker matched the colour without reference to the previous reading.

Packed Cell Volume.—The blood was spun for 45 min. at 3000 rev./min. in Wintrobe hæmatocrits. The same tube was used for both determinations on each person.

RESULTS OF EXERCISE

Marching.—Both in recruits and in trained soldiers, marching for 15 min. raised the mean serum-protein level (calculated from the serum sp. gr.) about 0·3 g. above the resting level. The course of the return to normal is shown in fig. 1. The recovery was 75% complete after 15 min. rest and complete after 30 min.

The statistical significance of these findings was tested by analysis of the variance of the serum sp. gr. figures between times and between persons (Fisher 1942, 1944). From the residual mean square we calculated the standard error of the difference between means and then tested the significance of these differences by the t test. Both in recruits and in trained soldiers the mean serum sp. gr. after 0, 15, and 30 min. rest differed very significantly from one another (P less than 0·001), but there was no significant change after 30 min.

There was a wide variation between individuals in the degree of elevation of the serum-protein level after marching (table I). The mean elevation in recruits was not significantly higher than in trained soldiers (t : 0·636, P : 0·5).

Pack Test.—We first determined the serum sp. gr. when the men had sat down for 30 min. before the test, and then after the test at intervals from 5 to 95 min. This violent exertion caused an elevation of the serum-protein level twice as great as did gentle exercise (marching), and the return to normal took twice as long (fig. 1). The recovery curve followed the same pattern both in recruits and in trained soldiers—after 20 min. rest the serum-protein level had fallen half-way towards its resting level; after 35 min. recovery was 85% complete; and the resting level was reached in an hour.

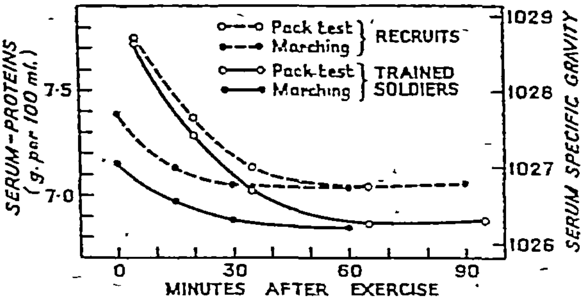


Fig. 1—Return of serum-protein level to normal on rest after exercise.

Statistical analysis showed that the mean serum sp. gr. 5, 20, 35, and 65 min. after the exercise differed very significantly, but there was no significant difference between the means after 65 and 95 min. rest, nor did these differ significantly from the mean resting sp. gr. before the exercise.

There was wide variation between individuals in the degree of elevation of the serum-protein level by the pack test (table II). The mean elevation was 20% greater in trained soldiers than in recruits, and the difference was definitely significant (t : 2·777, P : 0·01, area deprived of blood supply will be much greater than that following blockage of a similar vessel in a normal circulation."

Hence, presumably, the sudden fatal attacks in Hume's coalminers with previously symptomless fibrotic hearts. In this way too we find an explanation for the fact that, on the whole, angina in those aged over 70 runs a more benign course than it does in those aged under 50.

RELATION TO HYPERTENSION

Investigating the relationship between hypertension and coronary disease, I classified my cases as having a normal blood-pressure where the readings were below 160/100, moderate hypertension above these figures but below 200/120, and gross hypertension above 200/120. Throughout the entire series, in 44·6% the pressure was normal, in 33·7% moderately, and in 21·7% grossly increased. Excluding those cases in which an existing or recent coronary occlusion was thought to be responsible for a low blood-pressure, the figures were normal tension 30·6%, moderate hypertension 42·3%, gross hypertension 27·1%. So nearly 70% of my anginal patients without coincident or recent coronary occlusion were hypertensives. These findings surprised me, for I had not realised that the proportion of hypertensives was so high.

Fisher and Zukerman (1946) say that, in the literature, hypertension antedating coronary occlusion has varied between 33% and 73%. Of their own 108 cases of coronary occlusion, hypertension antedated the occlusion in 65% of the women and 39% of the men. They point out that negroes, though more liable than whites to hypertension, show a significantly lower incidence of coronary disease. Nevertheless, one cannot help suspecting that there may be some ætiological factor in common between hypertension and coronary disease. But unhappily, in spite of all the intensive investigation of hypertension during the last decade, fruitful though it has been, we are still abysmally ignorant of its ætiology —in the words of Harvey, "all we know is infinitely less than all that still remains unknown." Is it possible that in the remarkable sex-incidence of coronary disease we may find some clue to ætiology? Can it be that masculinity predisposes one to coronary disease, and that femininity safeguards from it—that perhaps cholesterol metabolism is vitiated by maleness? In this connexion it is interesting to note that some maintain that it is the more masculine type of woman who is prone to develop coronary disease—though I confess that this has not been my experience.

ENVOI

During the past few months I have often asked myself how Harvey would have approached the problem which I have here so lamentably failed to solve. Certainly not by speculations, nor by clinical impressions; and I very much doubt whether the statistical approach would have made much appeal to him. He would have agreed with Fernel that "We cannot be said to know a thing of which we do not know the cause" (Sherrington 1946). When asked *why* the blood circulated, he replied that he could not say. Harvey was interested only in proving by experiment that it did circulate: "it is shown by the application of a ligature that the passage of the blood is from the arteries into the veins" (Harvey 1616). I hope that today he would have accepted coronary arterial disease as the cause of angina, and I believe that he would be one of the many workers who are endeavouring "to search and study out the secrets" of hypertension and of arterial disease by experiment, whether in the laboratory or at the bedside.

In conclusion I recall the indenture of Harvey, dated June 26, 1656, in which he conveyed to the college the gift of his patrimonial estate of Burmarsh, in Kent. He exhorted the fellows and members to search and study out the secrets of nature by way of experiment; and also for the honour of the profession, "to continue mutual love and affection amongst themselves, witho which neither the dignity of the college can be preserv nor yet particular men receive that benefit by th admission into the college which else they might expe ever remembering that *Concordia res parvæ crescu discordia magnæ dilabuntur.*"

Never before was it more vital to the college, to th profession, and to the State, that these exhortations Harvey should be faithfully obeyed.

REFERENCES

Arlow, J. A. (1945) *Psychosom. Med.* **7**, 195.
Blalock, A., Taussig, H. B. (1945) *J. Amer. med. Ass.* **128**, 189.
Crafoord, C., Nylin, G. (1945) *J. thorac. Surg.* **14**, 347.
Dudley Committee Ministry of Health Report (1944) Design Dwellings, London.
Evans, W., personal communication.
Evans, W. F., Stewart, H. J. (1943) *Amer. Heart J.* **26**, 78.
Fisher, R. L., Zukerman, M. (1946) *J. Amer. med. Ass.* **131**, 385
French, A. J., Dock, W. (1944) *Ibid*, **124**, 1233.
Goetz, R. H. (1942) *Clin. Proc.* **1**, 190.
Halliday, J. L. (1945) *Psychosom. Med.* **7**, 135.
Harken, D. E., Glidden, E. M. (1943) *J. thorac. Surg.* **12**, 566.
Harvey, W. (1616) Lecture notes (in British Museum).
Herrick, J. B. (1912) *J. Amer. med. Ass.* **59**, 2015.
Hume, W. E., personal communication.
Hunter, A. (1946) *Quart. J. Med.* **15**, 107.
Karsner, H. T., Bayless, F. (1934) *Amer. Heart J.* **9**, 557.
Lowe, T. E., Wartman, W. B. (1944) *Brit. Heart J.* **6**, 115.
Mackenzie, J. (1923) Angina Pectoris, London.
McNee, J. W. (1925) *Quart. J. Med.* **19**, 44.
Metropolitan Life Insurance Co. of New York (1946) *Stat. Bull.* **27**, 3.
Murray, G., Wilkinson, F. R., Macgregor, R. (1938) *Canad. med Ass. J.* **38**, 317.
Newman, M. (1946) *Lancet*, Sept. 21, p. 409.
Osler, W. (1910) *Ibid*, i, 697, 839, 973.
Parker, R. L., Dry, T. J., Willius, F. A., Gage, R. P. (1946) *J. Amer med. Ass.* **131**, 95.
Powell, R. D. (1909) in Allbutt and Rolleston's System of Medic London, vol. VI, p. 171.
Roth, G. M., McDonald, J. B., Sheard, C. (1944) *J. Amer. med As* **125**, 761.
Sherrington, C. (1946) The Endeavour of Jean Fernel, London.
Smithwick, R. H. (1944) *Arch. Surg.* **49**, 180.
Stewart, H. J., Haskell, H. S., Brown, H. (1945) *Amer. Heart J.* **30**, 6, 541.
Stolkind, E. J. (1928) *Brit. J. Child. Dis.* **25**, 1.

SERUM-PROTEIN LEVEL OF INDIAN SOLDIERS

MARTIN HYNES
M.D. Camb., M.R.C.P.
MAJOR R.A.M.C.

MOHAMMED ISHAQ
L.S.M.F.
CAPTAIN I.A.M.C.

T. L. MORRIS
SERGEANT R.A.M.C.

From the Anæmia Investigation Team, General Headquarters, India

It is now generally accepted that the specific gravity of the serum, estimated by Van Slyke's copper-sulphate method, is a reasonably accurate measure of the serum-protein level. We used the method as part of a nutritional and hæmatological survey of Indian Army recruits (Hynes et al. 1946), but our results were so at variance with expectation that we could not be satisfied of their validity without a more detailed investigation, which is reported here. The work was done deep in the jungle with very limited laboratory facilities, and it is a fair criticism that it raises more problems than it solves.

If it is accepted that the sp. gr. of the serum of our subjects bears the usual relation to the serum-protein level, then we have shown that the recruit, fresh from a life of extreme poverty on a grossly protein-deficient diet, has a serum-protein level higher than that of the trained soldier. We found also that the effect of exercise on the sp. gr. of the serum was considerably greater than we had anticipated from the literature, but we present data to show that this effect can be avoided by simple precautions.

This work was done in Harihar, Mysore State, 1700 ft. above sea-level, during August, September, and October, 1945. The weather was cool but rather humid, with early-morning temperatures of about 75° F, and a maximum not exceeding 90° F.

a substantial volume of red cells were abstracted from the circulation during the hour after the pack test.

THE RESTING SERUM SPECIFIC GRAVITY

Table VI shows the frequency distribution of the resting serum sp. gr. in recruits, trained soldiers, and a few young European men who had been in the station for at least three months. Fig. 2 shows the Indians' distribution in terms of serum-protein. There was no significant difference between the mean serum sp. gr. of the Europeans and the trained Indian soldiers (t : 0·460, P : 0·65), but the recruits' mean was very significantly above that of trained soldiers (t : 3·994) and significantly above that of Europeans (t : 2·348, P : 0·02).

TABLE VI—FREQUENCY DISTRIBUTION OF RESTING SERUM SP. GR. IN INDIAN RECRUITS AND TRAINED SOLDIERS AND IN EUROPEANS

Serum sp. gr.	1023	1023·5	1024	1024·5	1025	1025·5	1026	1026·5	1027	1027·5	1028	1028·5	1029	1029·5	No. of cases	Mean	S.D.
Recruits ..	2	—	1	3	7	14	29	31	29	21	11	9	9	5	171	1026·81	1·2213
Trained soldiers	—	—	—	1	8	10	27	23	14	6	—	1	—	—	90	1026·25	0·7238
Europeans ..	—	—	—	1	1	5	5	4	3	1	1	—	—	—	21	1026·17	0·8416

The mean hæmoglobin in the 171 recruits was 14·67 g., S.D. 1·424, range 9–17 g.; in 90 trained soldiers 16·31 g., S.D. 0·9073, range 13–19 g.; and in 21 Europeans 15·85 g., S.D. 0·7048, range 14–17 g. In none of these groups was there any suggestion of a correlation between the hæmoglobin level and serum sp. gr. If blood is taken from incompletely rested subjects, a spurious correlation between the hæmoglobin and serum-protein levels must be created. Each hæmoglobin group will contain a proportion of men who on further rest would fall back into lower hæmoglobin and serum-protein groups. The highest hæmoglobin group is always numerically the smallest; hence it will contain a high proportion of subjects who, if their hæmoglobin and serum-proteins had reached the resting levels, would be in the larger penultimate hæmoglobin group. The highest hæmoglobin group as observed will therefore have an artificially high serum-protein level. It is easy to see that this will apply to all classes on the descending part of the hæmoglobin frequency distribution curve; and by the reverse process groups on the ascending part of the curve will be given an artificially low serum-protein level.

We have shown elsewhere (Hynes et al. 1946) that in these recruits there was a clear correlation between malnutrition, as assessed clinically, and the hæmoglobin level, but we found no similar correlation between nutrition and serum sp. gr.

DISCUSSION

The Medical Research Council (1945) has emphasised the importance of taking blood for serum-protein estimations after a strictly standardised period of rest. Our figures re-emphasise the necessity of this precaution not only for serum-protein estimations but also for other blood investigations. The very moderate exertion of walking a mile raises the average serum-protein level 0·3 g. per 100 ml., and the increase is often three times as great. When the subject sits down, the protein level falls within 30 min. to a stable resting level; three-quarters of this fall takes place in the first 15 min.

Very violent exertion for 5 min. raises the average serum-protein level 0·75 g., and an increase twice as great is not uncommon. After 20 min. rest the serum-protein level has fallen only half-way towards its resting level, and after 35 min. only 85%. The resting level is reached in an hour.

Vaughan (1945) has suggested that these variations are greater in untrained persons. We found no difference between recruits and trained soldiers in the elevation of the serum-protein level after gentle exercise, and after violent exertion the trained men showed the greater change. They had, however, worked harder.

The raised serum-protein level is largely due to a diminution in the plasma volume on exertion, and the other blood constituents naturally reflect this change. The average hæmoglobin level after walking a mile is 0·4 g. per 100 ml. (3% Haldane) above the resting level, and differences exceeding 1 g. (7% Haldane) are often seen. The average P.C.V. is 1% higher, and in individual cases often 2% higher. After violent exertion the mean increase in the hæmoglobin level is 0·9 g. (6% Haldane), and the increase may exceed 1·5 g. (10% Haldane). The mean rise in the P.C.V. is 4%, and an increase of 6% is not uncommon.

It is recognised (Medical Research Council 1945) that there is an appreciable increase in the volume of the red cell as the blood passes from the arterial to the venous state. Our data show that a person's activity affects the size of his venous red cells, presumably in an analogous fashion. We calculated that the red cell was very slightly smaller after walking a mile than after sitting down for 90 min.—presumably in walking an increased venous return without an appreciable increase in oxygen consumption increases the oxygenation of venous blood. On the other hand, the cells of men still in oxygen debt from violent exertion were some 2·5% larger than in the resting state.

We have shown that our data are compatible with the hypothesis that the increase in plasma volume on rest after gentle exercise is due simply to the addition of protein-free fluid to the circulating blood. After violent exertion, however, a more complex change must take place; besides an increase in plasma volume and a contraction of the red cells, either protein must pass into the circulation or red cells must be abstracted from it.

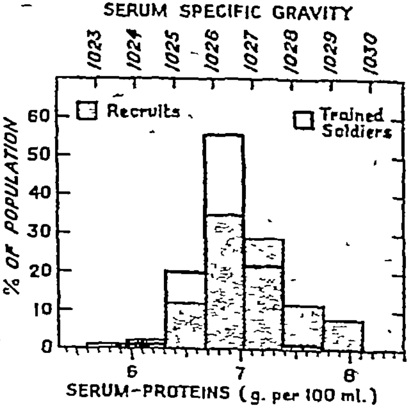


Fig. 2—Frequency distribution of serum-protein level in Indian recruits and trained soldiers.

Since hypoproteinæmia is a feature of famine starvation, it has been supposed that less absolute degrees of dietary protein deficiency will be reflected in the serum-protein level. Verma (1946) has shown that the civilian diet of our recruits was grossly deficient in animal protein and low in vegetable protein, yet we found that their serum sp. gr., and presumably serum-protein level, was definitely higher than that of trained soldiers of the same race. We could correlate anæmia, but not the serum sp. gr., with the degree of malnutrition. It does not necessarily follow that this was true before the recruits left their villages. When we examined them, they had enjoyed the Army ration (animal protein 20 g., vegetable protein 100 g. daily) for 1–4 weeks, and it is possible that this unaccustomed protein richness had raised their serum-protein from an abnormally low to an abnormally high level. Alternatively a change

TABLE II—FREQUENCY DISTRIBUTION OF ELEVATION OF SERUM-PROTEIN LEVEL BY VIOLENT EXERTION, CALCULATED FROM SERUM SP. GR. AT 5 AND 65 MIN. AFTER PACK TEST

Serum-protein (g./100 ml.)	Above resting level										No. of cases	Elevation	
	0·18	0·36	0·54	0·72	0·90	1·08	1·26	1·44	1·62	1·80		Mean	S.D.
Recruits	2	6	12	19	11	2	1	—	—	1	54	0·70	0·2678
Trained soldiers ..	1	2	7	10	14	10	2	2	—	—	48	0·85	0·2640

(In tables I and II, 1 sp. gr. unit is taken as equivalent to 0·36 g. of serum-protein per 100 ml.)

from the serum sp. gr. figures). It is impossible to assess the meaning of this difference, for the trained soldiers were better disciplined than the recruits and undoubtedly worked harder at the pack test.

The change in serum sp. gr. bore no relation to the pack-test score, which is supposed to measure physical efficiency, but our subjects coöperated in the test so badly that we place little reliance on the scores.

Concomitant Measurements.—We measured the serum sp. gr., hæmoglobin, and packed cell volume (P.C.V.) immediately after exercise and 90 min. later after rest in 67 recruits after marching and in 30 trained soldiers after the pack test. The results are shown in table III.

TABLE III—EFFECT OF EXERCISE ON MEAN SERUM SP. GR., SERUM-PROTEIN LEVEL (G./100 ML.), PACKED CELL VOLUME (P.C.V.), HÆMOGLOBIN (G./100 ML.), AND MEAN CORPUSCULAR HÆMOGLOBIN CONCENTRATION (M.C.H.C.)

—		Serum sp. gr.	Serum-protein	P.C.V.	Hæmoglobin	M.C.H.C.
67 recruits	Marching	1027·91	7·46	43·55	14·75	33·98
	At rest ..	1027·12	7·17	42·74	14·39	33·78
30 trained soldiers	Pack test	1028·87	7·80	52·52	17·47	33·28
	At rest ..	1026·57	6·97	48·55	16·58	34·15

Values obtained at 0 and 90 min. after marching and 5 and 95 min. after pack test.

After marching, the hæmoglobin and P.C.V. increases were of the same degree as the elevation of the serum-protein level; *the range of the changes is shown in* tables IV and V. The resting mean corpuscular hæmoglobin concentration (M.C.H.C.) was slightly lower than the working value, and the mean difference, 0·197%, S.D. 0·6764, was significantly different from zero (t : 2·384, P : 0·02). The suggestion is that the red cell is a little larger at rest than during gentle exercise, but so slight a change might well be extraneous rather than physiological.

After violent exercise the changes in hæmoglobin and P.C.V. were much greater (tables II, IV, V). The average increase in hæmoglobin was 0·9 g. (range 0–1·6 g.), and the average P.C.V. increase was 4% (range 2–6%). The working M.C.H.C. was considerably below the resting value, and the mean difference, 0·873%, S.D. 0·7182, differed very significantly from zero. The working mean corpuscular volume must therefore have been about 2·5% above the resting volume.

If we assume that the return of the serum-protein level to the resting level after exercise is effected solely by the addition of protein-free fluid to the circulating plasma, then the resting plasma volume must be:

$$\frac{P}{P'}\ B(100-H) \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad (1)$$

where B, H, and P are the working blood-volume, P.C.V., and serum-protein level respectively, and P′ is the resting serum-protein level. If we neglect the slight expansion of the red cells after gentle exercise demonstrated above and assume the circulating red-cell volume to remain unchanged at B.H, then the new P.C.V., H′, should be given by the equation:

$$H' = \frac{100.\ B.H}{B.H+P(100-H).B/P'} = \frac{100.\ H.P'}{100P-H(P-P')} \quad \cdots (2)$$

Such an equation, containing three estimations subject to experimental error, must be very inaccurate; but, if our hypothesis is true, it should give an equal number *of positive and negative errors.* We calculated the equation for our 67 results after marching and found that the mean difference (observed−calculated value) was +0·124, which was less than its standard error of ±0·1259. Our results are therefore consistent with the hypothesis that the return of the serum-protein level after gentle exercise to the resting level is due simply to the addition of protein-free fluid to the circulating plasma. (It should be noted that we have not proved this hypothesis, we have merely failed to disprove it.)

The pronounced change in mean corpuscular volume after the pack test necessitates a more complicated calculation. If we assume that after the pack test no *red cells went out of circulation, then the resting* blood-volume would be given by $B\ \frac{Hb}{Hb'}$, where B is the working blood-volume, and Hb, Hb′ are the working and resting hæmoglobin levels respectively. The equation (1) derived above for the plasma volume may therefore be equated to:

$$\frac{P}{P'}\ B(100-H) = \frac{Hb}{Hb'}\ B(100-H')$$

or

$$Hb' = \frac{100-H'}{100-H} \cdot \frac{P'}{P}\ Hb \quad \cdots \quad \cdots \quad \cdots \quad (3)$$

This equation contains five estimations subject t experimental error; but again, if our hypothesis i *true, it should give an equal number of* positive an negative errors. We calculated the equation for the 3 results after the pack test and found the mean differenc (calculated−observed value) to be +0·393, S.D. 0·5741 So great a difference from zero would not occur on time in a thousand by chance (t : 3·783), so we mus conclude that our hypothesis is wrong. The discrepanc would be explained either if the new fluid added to th circulating plasma had a small protein content, or i

TABLE IV—FREQUENCY OF DISTRIBUTION OF ELEVATION O HÆMOGLOBIN LEVEL BY EXERCISE

Hæmoglobin (g./100 ml.)	Below	Above resting level				No. of cases	Elevation	
	0·5–	0–	0·5–	1·0–	1·5–		Mean	S.D.
Marching ..	17	25	20	5	—	67	0·36	0·3921
Pack test ..	—	4	14	8	4	30	0·89	0·4185

Calculated from the figures immediately and 90 min. after exercis

TABLE V—FREQUENCY OF DISTRIBUTION OF ELEVATION O PACKED CELL VOLUME BY EXERCISE

P.C.V. (%)	Below	Above resting level							No. of cases	Elevation	
	1–	0–	1–	2–	3–	4–	5–	6–		Mean	S.D.
Marching ..	13	26	19	9	—	—	—	—	67	0·81	0·9573
Pack test ..	—	—	—	7	9	6	6	2	30	3·97	1·2313

Calculated from the figures immediately and 90 min. after exercise f micturition, and thought his urine had been slightly red or two or three days. He noticed puffiness of the eyelids three days before admission.

His past history had been uneventful, except for a slight sore throat after bathing in the Thames twenty-one days before. This cleared up in a few days, and he had again bathed in the Thames twelve days before entering hospital. No-one else in the family had been ill recently.

He was a well-developed intelligent boy, looking acutely but not seriously ill. Temperature 102° F, pulse-rate 108, respirations 22 per min. There was slight but definite puffiness of the eyelids, chiefly of the upper lids, but no peripheral œdema. Skin hot and dry, breath fœtid, tongue furred, and mild marginal gingivitis. Throat slightly injected. No abnormal physical signs in heart and lungs. Liver, spleen, and kidneys not palpable. Except for a suggestion of neck-rigidity, examination of the central nervous system revealed nothing unusual. Urine contained visible blood and much albumin, with numerous cellular and granular casts but no organisms. Blood-urea 37 mg. per 100 c.cm. Blood-pressure 120/60 mm. Hg. A tentative diagnosis of acute glomerulonephritis was made.

Next morning the boy seemed better, and his temperature had fallen to 100° F, but it rose during the night to 104° F and then fell to normal. Throat-swab culture was negative for hæmolytic streptococci, but a white-cell count showed 8900 cells per c.mm. with polymorphs 73%, lymphocytes 20%, and monocytes 7%.

On the 14th his temperature again rose to 101·8° F and he still complained of headache. Photophobia was well marked, but there was no conjunctivitis. Neck-stiffness was more evident, and slight blurring of the optic disk was seen on examination of the fundi. A lumbar puncture was performed, and turbid C.S.F. under raised pressure was obtained; this contained 690 cells per c.mm. (lymphocytes 70%, polymorphs 30%) but was sterile on culture; chlorides were 690 mg. per 100 c.cm., and an excess of globulin was present.

Leptospirosis was suspected by this time, so penicillin therapy was begun the same day, 10,000 units being given intrathecally, followed by the same dose intramuscularly, the latter being repeated every three hours. In twelve hours the boy seemed perfectly well, his temperature was normal, urinary abnormalities had disappeared, and he made a dramatically swift recovery. Penicillin treatment was discontinued on the 17th, after 22 doses (220,000 units) had been given. On that day, however, the C.S.F. was still turbid and contained 300 white cells per c.mm., with lymphocytes predominating but no excess of globulin. Chlorides were 740 mg. per 100 c.cm. Culture was again sterile. Confirmation had been received from the hospital laboratory of the presence of antibodies to *L. icterohæmorrhagiæ* in a specimen of blood taken on Sept. 18, but the peculiar features of the case suggested the desirability of a more extensive investigation than was possible locally. This later investigation is described below.

TABLE I—DIRECT RESULTS OF SEROLOGICAL TESTS

Strain	Type	Titre of serum obtained on		
		Sept. 22	Oct. 15	Nov. 24
Wijnberg ..	*L. ictero-hæmorrhagiæ* AB	300	100	100
McIntyre ..	*L. ictero-hæmorrhagiæ* B	1000	300	300
Utrecht IV	*L. canicola*	10,000	10,000	3000
Berlin 4129	*L. canicola*	10,000	30,000	10,000
L.5260 ..	..	30	30	..
Moscow V. ..	*L. grippo-typhosa*	0	..	..
..	*L. pomona* ..	0	..	..
..	*L. sejroe* ..	100	100	30
..	*L. autumnalis A*	0	..	..
..	*L. autumnalis B*	0	..	..
..	*L. bataviæ* ..	0	..	..

The patient was discharged from hospital on Oct. 1 quite well and remained free from symptoms till Nov. 15, when he was readmitted with a history of slight hæmaturia. His main complaint was headache, but his C.S.F. showed no increase in cells or protein; his urine, however, contained numerous red blood cells. In hospital he had no symptoms, and in two days his urine was normal, his blood-urea 41 mg. per 100 c.cm., and a urea-concentration test gave normal results. Blood-pressure was not raised. Before his discharge on Dec. 1 a further sample of blood was obtained for serological tests.

Serological Investigation.—Serological tests were carried out according to Schüffner's method as described by Davidson et al. (1934). Both living and formolised culture antigens were used in parallel tests, but the results were practically identical. The strains of leptospira used were "Wijnberg," a typical "complete" strain of *L. icterohæmorrhagiæ* (Gispen and Schüffner 1939); "McIntyre," an incomplete strain (proved by reciprocal agglutination to be identical with strains "Hickey" and "Wien I"); "Utrecht IV," a typical strain of *L. canicola* used by Prof. W. Schüffner; and "Berlin 4129," another strain of *L. canicola*, obtained from Professor Schlossberger. "L.5260" was provided by Prof. A. D. Gardner, and most of the other strains by Dr. Lépine, of the Pasteur Institute. Absorption tests were carried out according to the technique followed by Buckland and Stuart (1945). Table I shows the results of the direct tests on the patient's sera, and table II the necessary absorption tests. Titres are given as the reciprocal of the dilutions in each case.

TABLE II—ABSORPTION TESTS ON SERUM TAKEN SEPT. 22

Titre with	Unabsorbed	Absorbed with	
		L. ictero-hæmorrhagiæ B	*L. canicola*
L. ictero. AB ..	300	0	0
L. ictero. B ..	1000	30	30
L. canicola ..	10,000	3000	0
L. sejroe ..	100	..	0

The titres with both strains of *L. canicola* were higher than the corresponding titres with strains of *L. icterohæmorrhagiæ*, and the former tended to rise and the latter to fall as the disease progressed. The *L. canicola* antibodies are shown to be specific by the absorption test, where *L. canicola* removes both homologous and heterologous antibodies from the serum, whereas a *L. icterohæmorrhagiæ* strain leaves the *L. canicola* antibodies practically intact.

DISCUSSION

Since this is claimed to be the first case of *L. canicola* infection discovered in Britain, it is unfortunate that an opportunity did not arise to isolate the organism from the patient, but on serological grounds the evidence is quite definite. Para-specific serum titres to *L. canicola*, sometimes greater than to *L. icterohæmorrhagiæ*, have been encountered occasionally by one of us (R. D. S.) in the early stages of Weil's disease and have been recorded by Gispen and Schüffner (1939). Such reactions are reputedly associated mainly with infections caused by the "incomplete" B type of *L. icterohæmorrhagiæ*, though there is no evidence that this type has any greater antigenic similarity to *L. canicola* than the usual AB type. Petersen (1938) made the observation that within the classical type of *L. icterohæmorrhagiæ* was a subtype which lacked an antigenic factor present in the others. Subsequently this "incomplete" subtype was represented by the letter B, while the "complete" strains were indicated by the letters AB. There is apparently no clinical difference in the diseases caused by these respective strains, but the serological investigation of cases is often helped considerably by an appreciation of these antigenic variations. In Weil's disease the para-specific serum reactions to *L. canicola* invariably decline as the disease progresses, and the specific antibody response becomes dominant; they are also readily removed by absorption with a *L. canicola* culture, which has little or no effect on the specific antibody. Absorption of such a serum, however, with a *L. icterohæmorrhagiæ* culture removes both specific and para-specific antibodies. In the present case the dominance of *L. canicola* antibodies throughout the illness, their resistance to absorption with *L. icterohæmorrhagiæ*, and the almost complete absorption of both *L. icterohæmorrhagiæ* and *L. canicola* antibodies with *L. canicola*, leave no doubt that in this instance *L. canicola* was the infecting strain.

The manner of infection can only be surmised. The boy did not possess a dog, nor did he play with dogs.

in the level of some other blood constituent—e.g., cholesterol—may have been responsible for the increased serum sp. gr. On either hypothesis, with custom would come tolerance to protein and a fall of the serum sp. gr. to normal.

We may conclude by re-emphasising the importance of strictly standardised conditions in any hæmatological survey. The change in the plasma volume after exercise not only depends on the amount of exercise, but also there are wide individual variations in the response to a given amount of exercise. A stable value is only reached after $^{1}/_{2}$–1 hour's rest, and it is essential that the subject should rest for this period before he is bled, and be bled where he has rested. The variations seen after a less complete period of rest may be unimportant in the individual case, but they are large enough to introduce serious errors into the statistical analysis of even moderately large series.

It remains an open question whether the serum-protein level may be taken as an index of the protein adequacy of the diet. Certainly we have shown that the serum sp. gr. is above rather than below the normal level in men who after a lifetime of protein semi-starvation have eaten a good diet for two or three weeks. It is to be hoped that this problem will be further investigated with the aid of the biochemical methods which were not at our disposal in the jungle during this investigation.

SUMMARY

We estimated the serum-protein level of Indian recruits and trained soldiers by the copper-sulphate serum sp. gr. method.

Gentle exercise caused average increases of 0·3 g. per 100 ml. in the serum-protein level, 0·4 g. per 100 ml. in the hæmoglobin level, and 1% in the packed cell volume (P.C.V.). The increases were sometimes three times as great as this.

These blood values returned to their resting level after 30 min. rest. This change may have been due simply to the addition of protein-free fluid to the circulating blood.

Violent exertion caused average increases of 0·75 g. per 100 ml. in the serum-protein level, 0·9 g. per 100 ml. in the hæmoglobin level, and 4% in the P.C.V. The increases were sometimes twice as great as this.

The resting levels were again reached after an hour's rest. This change was largely due to an increase in the plasma volume, but also the red cells contracted, and either protein passed into the circulation or red cells were abstracted from it.

Our findings re-emphasise the importance, in any large-scale hæmatological survey, of taking blood after an adequate and strictly standardised period of rest.

There was no difference between the resting serum sp. gr. of trained Indian soldiers and Europeans, but the resting serum sp. gr. of newly joined Indian recruits was significantly higher than that of either. Possible explanations are briefly discussed.

Our thanks are due to the D.M.S. in India for permission to publish this paper; Prof. E. J. King for his very helpful advice and criticism; Mr. C. K. Dilwali, statistical officer (research), General Headquarters, India, for advice on statistical methods; and Lieut.-Colonel G. M. Holland, commanding no. 3 Training Battalion, I.P.C., and his officers for their help and coöperation.

REFERENCES

Fisher, R. A. (1942) The Design of Experiments, London.
— (1944) Statistical Methods for Research Workers, London.
Hynes, M., Ishaq, M., Morris, T. L. (1945) *Indian J. med. Res.* 33, 271.
— — — Verma, O. P. (1946) *Ibid*, in the press.
Medical Research Council (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 252.
Phillips, R. A., Van Slyke, D. D., Dole, V. P., Emerson, K., Hamilton, P. B., Archibald, R. M. (1945) Copper Sulfate Method for Measuring Specific Gravities of Whole Blood and Plasma, New York.
Vaughan, J. M. (1945) cited by Medical Research Council (1945).
Verma, O. P. (1946) in the press.
Whitby, L. E. H., Britton, C. J. C. (1942) Disorders of the Blood, London.

LEPTOSPIROSIS CANICOLA

A CASE TREATED WITH PENICILLIN

M. D. BABER
M.D. Lond., M.R.C.P.
PHYSICIAN, ST. HELIER HOSPITAL, CARSHALTON, SURREY

R. D. STUART
M.D., D.Sc. Aberd., D.P
CITY BACTERIOLOGIST
GLASGOW

Leptospira canicola is morphologically and cultura similar to *Leptospira icterohæmorrhagiæ*, from which i can be distinguished by serological tests and by t fact that it is carried and transmitted solely by do (Walch-Sorgdrager and Schüffner 1938). In the do *L. canicola* produces a variety of symptoms, from trivial to severe, but generally referable more to kidney damage than to liver involvement (Dhont et al. 1934). The various forms of nephritis, particularly that variety recognised clinically as Stuttgart disease, are common, and jaundice is rare. After recovery the animal is liable to become a carrier, though usually for a few months only (Klarenbeek and Voet 1933). Leptospiræ are then found lying in masses within the lumina of the kidney tubules, in exactly the same situation as *L. icterohæmorrhagiæ* are found in the rat, and are excreted similarly in the urine. *L. canicola* is highly infectious to dogs, but its pathogenicity is much less than that of *L. icterohæmorrhagiæ*, and its invasive power in other animals, such as guineapigs, is very much less. This may explain why the number of human infections recorded has been so small.

The first instance of human disease was identified in Holland by Dhont et al. (1934), and by 1941 Raven noted that 22 such infections had been discovered: 12 in Holland, 1 in Austria, 7 in Denmark, and 2 in California Since that time 2 cases have been claimed by Bruno et al. (1943), and another by Tievsky and Schaefer (1944), all in the U.S.A. The first case in Norway has lately been recorded by Aalvik (1946). Other cases may have been reported in journals inaccessible during the war, but the incidence is unlikely to be high. Tiffany and Martorana (1942) investigated sera from 1351 persons in New York City without finding any positive to *L. canicola*.

In Britain no disease directly ascribable to *L. canicola* has so far been recorded. Stuart (1938) found low-titre agglutinins to this organism (proved to be specific by absorption tests) in the serum of a woman tripe-scraper, aged 43, who gave no history of illness. The dog-transmitted leptospiral disease recorded by Gardner (1943) was ascribed by him to a serologically distinct organism, *L. icterohæmorrhagiæ* 5260.

SYMPTOMS OF LEPTOSPIROSIS CANICOLA IN MAN

Walch-Sorgdrager (1939) discussed the largest series of human cases so far recorded. She pointed out that clinically the disease was very variable in signs and symptoms; jaundice, however, was rare, and mortality nil. The typical syndrome produced by *L. canicola* in the dog—the serious kidney disorder leading to uræmia—was not found in man, though albuminuria, with leucocytes, red blood cells, and casts in the urine, was often present for a few days. On the other hand, the frequency of meningitis or meningismus was notable ("in 4 out of 12 patients"). The cerebrospinal fluid (C.S.F.) was hazy or frankly purulent, usually with polymorphs predominant. In general, patients exhibited symptoms like those of influenza with an acute onset, fever, headache, shivering, and muscular pains. Convalescence was often protracted but occasionally dramatically brief. Our patient showed many of these features.

CASE-RECORD

A boy, aged 11 years, previously healthy, was admitted t hospital on Sept. 10, 1945, with hæmaturia, malaise, headache, and pains in the calves for two days. He felt nauseate but had not vomited. He admitted to moderate frequency

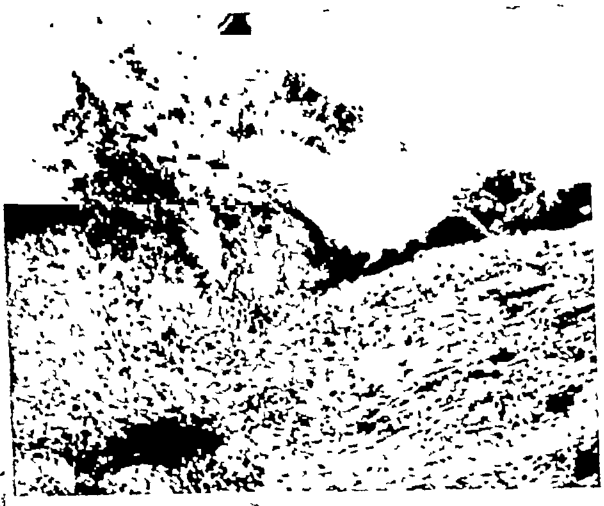


Fig. 2—Photomicrograph of section of ulcerated inferior turbinate bone. Note demarcation between necrosis and slough on the left and myxomatous connective tissue, with its colonies of fibroblasts and capillaries on the right. (×90.)

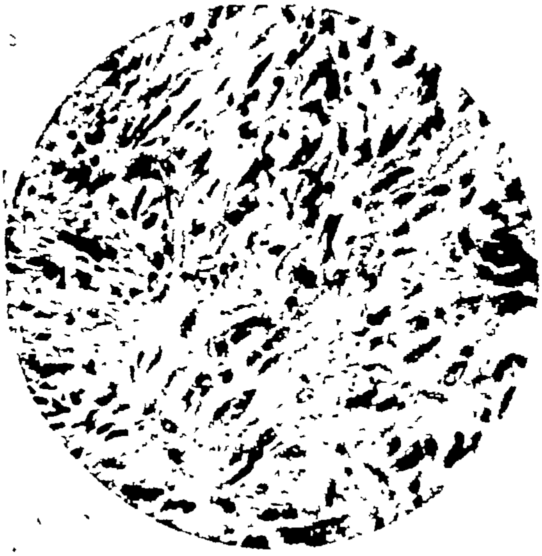


Fig. 4—Photomicrograph of cellular granulation tissue. (×320.)

Opinion seems to be more or less equally divided between describing the condition as an infective granuloma of uncertain ætiology and attributing the changes to a tumour growth.

All forms of treatment have been tried, from chemical cautery and surgical excision to radium implantation and X rays. Woods's (1921) second case was healed by radium needles placed in dental wax upon the ulcer-perforation. McArthur's (1925) case derived no benefit from radium, but showed satisfactory healing after three full doses of X-ray therapy. All other reported cases have been resistant to any form of treatment, and death has usually resulted from a vague cachexia or toxæmia coupled with repeated blood-loss from the lesion.

CASE-RECORD

A farmer, aged 58, was first seen by his doctor in May, 1945, with a history of a neuralgic pain involving the distribution of the second division of the 5th nerve. The teeth were carious, and it was thought that the neuralgia was due to sepsis in the upper jaw. He did not take his doctor's advice to have dental treatment. The first upper right premolar, canine, and lateral incisor teeth fell out during the next four weeks, followed by ulceration and necrosis of the adjacent alveolar margin. The ulceration spread along the premaxillary region of the hard palate, destroying the mucosa. This was followed by a sloughing and necrosis of the bone, with formation of a fœtid sinus opening into the floor of the nose.

On August 29, 1945, the patient was seen at the Royal Salop Infirmary, when a hole 1 in. in diameter was found in the premaxillary region of the palate and the alveolar margin. There was also a tender red swelling over the anterior wall of the maxilla. A tentative diagnosis of syphilis was made, but the Wassermann reaction was negative. The patient was told to report in a week but did not, and was sent for on Sept. 17.

On the 19th the patient was seen again as an outpatient. He was cachectic from toxic absorption, with a very pale face, and had a temperature of 100° F. He talked with a nasal voice. The anterior end of the inferior turbinate was covered with a dirty greyish slough blocking the right nasal passage. The lateral wall of the nose beneath the inferior turbinate was eroded, and the whole of the anterior half of the floor of the nose was absent. Necrosis also involved the floor of the antrum. The septum was intact, and the disease was limited to the right nasal cavity. The middle turbinate was not involved.

After the sloughs had been removed from the nose the posterior third of the inferior turbinate was seen to be intact. This was seen with a nasopharyngoscope, it being impossible

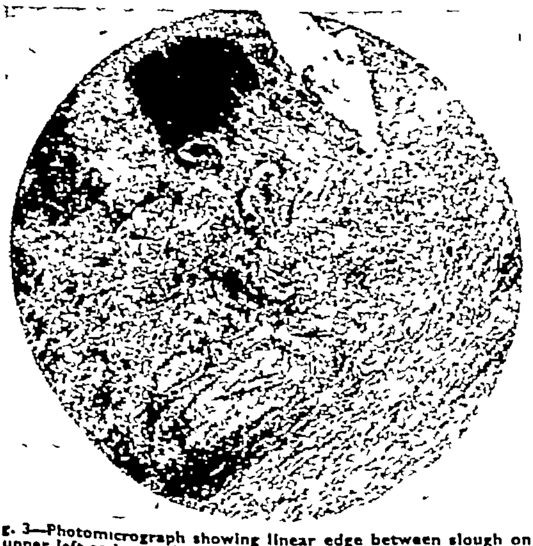


Fig. 3—Photomicrograph showing linear edge between slough on the upper left and granulation tissue. Note obliterating endarteritis. (×60.)

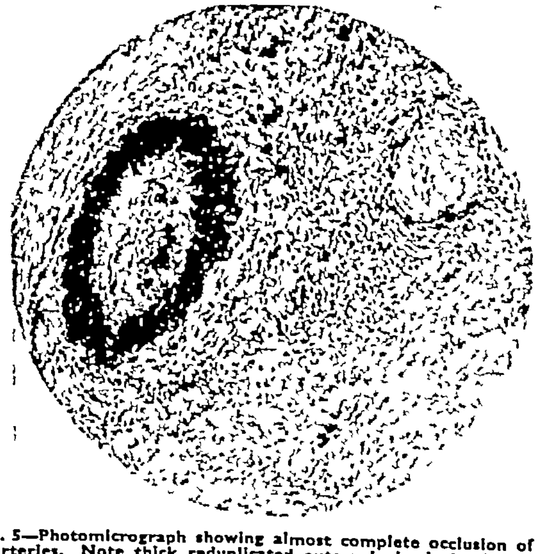


Fig. 5—Photomicrograph showing almost complete occlusion of two arteries. Note thick reduplicated external elastic lamina of the larger artery (orcein stain). (×115.)

Most probably the infection was acquired while bathing; and, though this is unusual, there are fully authenticated instances of leptospirosis canicola acquired in this way (Walch-Sorgdrager 1939, p. 336). There is no reason against the occurrence of bathing infections with *L. canicola*; dogs can contaminate water just as effectively as rats, though one must admit that there are fewer dogs and a smaller relative percentage of leptospiral carriers. The last figure is quite unknown. The incidence of canine infection, however, has been determined, chiefly by serological methods, in many parts of the world and is known to be high. In Amsterdam it seems to be greater than 30% (Walch-Sorgdrager 1939), in Philadelphia it is about 25% (Raven 1941), and in Glasgow Stuart (1946) has found antibodies to *L. canicola* in over 40% of street dogs. Klarenbeek (1938) states that more than 50% of dogs excrete leptospira for a variable period following infection; but since this period is often short, the percentage of dog "carriers" at any one time is probably small.

The clinical features of the present case generally accord with previous descriptions of leptospirosis canicola. The prominence of the renal symptoms, however, is noteworthy owing to the similarity of the disease as it occurs in dogs, but in the human case there is no evidence of a developing chronic nephritis. One cannot tell if the brief recurrence of nephritic symptoms is ascribable to the previous leptospiral disease. The dramatic change in the clinical condition following penicillin treatment is interesting and is in accordance with the experimental work of Larson and Griffitts (1945). On the other hand, a similar clinical course has been observed in patients where no specific therapy has been used. The disease is naturally self-limiting, and therefore no claim can be made for a specific therapeutic effect of penicillin.

SUMMARY

A case of leptospirosis canicola in a boy is ascribed to bathing in the Thames.

The diagnosis was established by the demonstration of a rising serum antibody titre to *L. canicola* during the course of the illness and by absorption tests with homologous and heterologous strains of leptospira.

The patient was treated with 220,000 units of penicillin, and dramatic clinical improvement followed.

REFERENCES

Aalvik, T. (1940) *Nord. Med.* 30, 749.
Bruno, F. E., Wilen, C. J. W., Snavely, J. R. (1943) *J. Amer. med. Ass.* **123**, 519.
Buckland, F. E., Stuart, R. D. (1945) *Lancet*, ii, 331.
Davidson, L. S. P., Campbell, R. M., Rae, H. J., Smith, J. (1934) *Brit. med. J.* ii, 1137.
Dhont, C. M., Klarenbeek, A., Schüffner, W. A. P., Voet, J. (1934) *Ned. Tijdschr. Geneesk.* 78, 5197.
Gardner, A. D. (1943) *Lancet*, ii, 157.
Gispen, R., Schüffner, W. (1939) *Zbl. Bakt.* **144**, 427.
Klarenbeek, A. (1938) *Ibid*, **142**, 83.
— Voet, J. (1933) *Ned. Tijdschr. Geneesk.* 77, 398.
Larson, C. L., Griffitts, J. J. (1945) *Publ. Hlth Rep., Wash.* 60, 317.
Petersen, C. B. (1938) Tropical Congress, Amsterdam (see Gispen and Schüffner 1939).
Raven, C. (1941) *J. infect. Dis.* 69, 131.
Stuart, R. D. (1938) *Lancet*, i, 603.
— (1946) *Vet. Rec.* 58, 131.
Tievsky, G., Schaefer, B. G. (1944) *Med. Ann. Dist. Columbia*, **13**, 11.
Tiffany, E. J., Martorana, N. F. (1942) *Amer. J. Hyg.* 36, 195.
Walch-Sorgdrager, B. (1939) *Bull. Hlth Org. L.o.N.* 8, 143.
— Schüffner, W. (1938) *Zbl. Bakt.* **141**, 97.

"... Of course there are important differences between the medical profession and the university teaching profession. I think the main difference is that the medical profession has, on the whole, to work a good deal harder, also it has to work at less regular hours, and, on the whole, its job is not so pleasant because there are many patients who are not quite so attractive to deal with as the young men and young women in universities. For that very reason, I personally think you ought to pay the medical profession better than you pay the teachers. It would be quite easy to do that without paying them very much."—Lord BEVERIDGE, *Hansard*, Oct. 9, par. 94.

MALIGNANT GRANULOMA OF THE NOSE

S. W. G. HARGROVE
M.B. Camb., F.R.C.S.E., D.L.O.
SENIOR SURGEON, EYE, EAR, AND THROAT HOSPITAL, SHROPSHIRE AND MID WALES

J. H. FODDEN
M.D. Leeds
ACTING PATHOLOGIST, ROYAL SALOP INFIRMARY, SHREWSBURY

A. J. RHODES
M.D. Edin., F.R.C.P.E.
LECTURER IN BACTERIOLOG
LONDON SCHOOL OF HYGIEN

PROGRESSIVE ulceration of the nose, palate, and wal of the antrum, known to ear, nose, and throat surgeon as malignant granuloma of the nose (Woods 1921), wa probably first described by McBride in 1896 (see McBride 1926), and about a dozen cases have since been published (Woods 1921, McKenzie 1922, McArthur 1925, Chatellier 1929, Kraus 1929, Goodyear 1930, Stewart 1933, Hall 1933, Dempsey 1933).

The lesion begins on the inferior concha or nasal septum and proceeds to sloughing of the concha and perforation of the septum and hard palate, the ulcerated areas having clearly defined margins. An abscess may form in the soft tissues of the cheek, with perforation of the anterior wall of the antrum. There is usually no regional lymphadenopathy. The lesions are not painful. There is a peculiar odoriferous bloodstained discharge from the affected nostril. The disease is usually rapidly fatal, though the precise cause of death is often obscure.

Bacteriological investigations have not incriminated any pathogenic bacteria, fungi, or protozoa, and Stewart (1933) reported negative results on animal inoculation. The Wassermann and Kahn tests have always proved negative, and there has been a complete lack of response to arsenicals (McArthur 1925). Apart from the local lesions in the nose, mouth, and antrum, necropsies have not revealed any specific changes, though in one of Hall's (1933) cases small nodules of reticulum-like cells were found in the lung and cortex of the kidney.

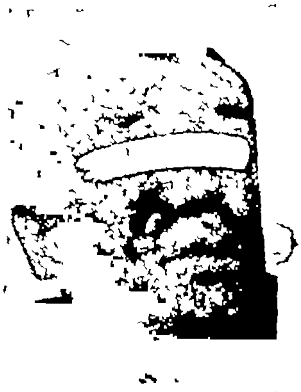


Fig. 1—Perforation of cheek and anterior wall of antrum exposing lateral wall of nose with necrotic anterior end of inferior turbinate bone.

The histology of the local lesion presents the general features of invasion by a cellular granulation tissue, with necrosis of bone and cartilage.

Muir examined McBride's (1926) case and stated that the condition did *not correspond to any* known type of ulceration, and in particular syphilis, yaws, and tuberculosis could be excluded.

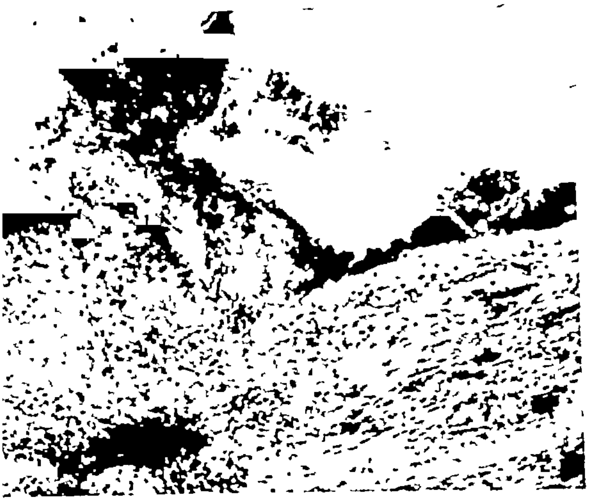
O'Sullivan, examining Woods's (1921) case, reported a zone of granulation tissue extending *into the healthy* tissue and breaking down behind.

In McArthur's (1925) case, Dew stated that the lesion did not conform to any known type of malignancy though bearing some resemblance to an atypical spheroidal-celled carcinoma.

Kraus (1929) described infiltration of bone and cartilage by a cellular granulation tissue and thought that sarcomatous change had supervened on an infective granuloma.

With regard to the granulation tissue, Chatellier (1929) thought there were resemblances to lupus pernio, and Ewing, examining Wood's (1931) case, thought that the changes resembled syphilis though they were not typical. Case, examining the same material, diagnosed tumour, and Weidman classified the condition as a granuloma.

Stewart (1933) described a round-celled infiltration of granulation tissue, engorged vessels, and scattered hæmorrhages, proliferating blood-vessels showed thickened walls and endarteritis with hyaline changes. Bone was actively destroyed. In one *case the appearances* suggested a fibroma.



ig. 2—Photomicrograph of section of ulcerated inferior turbinate bone. Note demarcation between necrosis and slough on the left and myxomatous connective tissue, with its colonies of fibroblasts and capillaries on the right. (×90.)

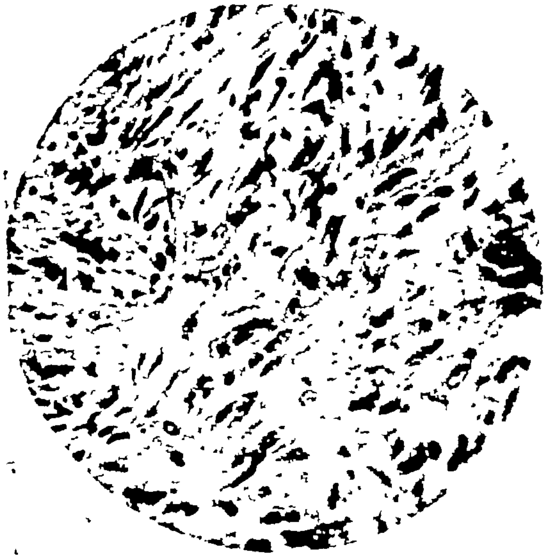


Fig. 4—Photomicrograph of cellular granulation tissue. (×320.)

Opinion seems to be more or less equally divided between describing the condition as an infective granuloma of uncertain ætiology and attributing the changes to a tumour growth.

All forms of treatment have been tried, from chemical cautery and surgical excision to radium implantation and X rays. Woods's (1921) second case was healed by radium needles placed in dental wax upon the ulcer-perforation. McArthur's (1925) case derived no benefit from radium, but showed satisfactory healing after three full doses of X-ray therapy. All other reported cases have been resistant to any form of treatment, and death has usually resulted from a vague cachexia or toxæmia coupled with repeated blood-loss from the lesion.

CASE-RECORD

A farmer, aged 58, was first seen by his doctor in May, 1945, with a history of a neuralgic pain involving the distribution of the second division of the 5th nerve. The teeth were carious, and it was thought that the neuralgia was due to sepsis in the upper jaw. *He did not take his doctor's advice to have dental treatment.* The first upper right premolar, canine, and lateral incisor teeth fell out during the next four weeks, followed by ulceration and necrosis of the adjacent alveolar margin.

The ulceration spread along the premaxillary region of the hard palate, destroying the mucosa. This was followed by a sloughing and necrosis of the bone, with formation of a fœtid sinus opening into the floor of the nose.

On August 29, 1945, the patient was seen at the Royal Salop Infirmary, when a hole 1 in. in diameter was found in the premaxillary region of the palate and the alveolar margin. There was also a tender red swelling over the anterior wall of the maxilla. A tentative diagnosis of syphilis was made, but the Wassermann reaction was negative. The patient was told to report in a week but did not, and was sent for on Sept. 17.

On the 19th the patient was seen again as an outpatient. He was cachectic from toxic absorption, with a very pale face, and had a temperature of 100° F. He talked with a nasal voice. The anterior end of the inferior turbinate was covered with a dirty greyish slough blocking the right nasal passage. The lateral wall of the nose beneath the inferior turbinate was eroded, and the whole of the anterior half of the floor of the nose was absent. Necrosis also involved the floor of the antrum. The septum was intact, and the disease was limited to the right nasal cavity. The middle turbinate was not involved.

After the sloughs had been removed from the nose the posterior third of the inferior turbinate was seen to be intact. This was seen with a nasopharyngoscope, it being impossible

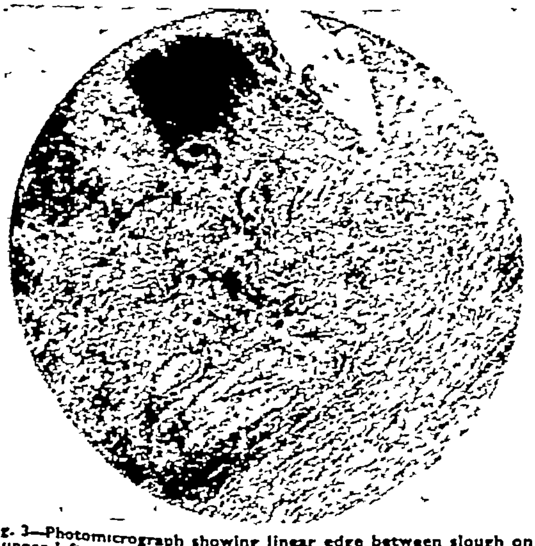


Fig. 3—Photomicrograph showing linear edge between slough on the upper left and granulation tissue. Note obliterating endarteritis. (×60.)

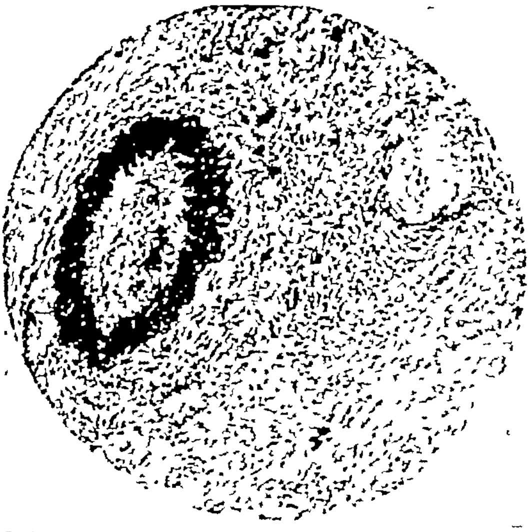


Fig. 5—Photomicrograph showing almost complete occlusion of two arteries. Note thick reduplicated external elastic lamina of the larger artery (orcein stain). (×115.)

Most probably the infection was acquired while bathing; and, though this is unusual, there are fully authenticated instances of leptospirosis canicola acquired in this way (Walch-Sorgdrager 1939, p. 336). There is no reason against the occurrence of bathing infections with *L. canicola*; dogs can contaminate water just as effectively as rats, though one must admit that there are fewer dogs and a smaller relative percentage of leptospiral carriers. The last figure is quite unknown. The incidence of canine infection, however, has been determined, chiefly by serological methods, in many parts of the world and is known to be high. In Amsterdam it seems to be greater than 30% (Walch-Sorgdrager 1939), in Philadelphia it is about 25% (Raven 1941), and in Glasgow Stuart (1946) has found antibodies to *L. canicola* in over 40% of street dogs. Klarenbeek (1938) states that more than 50% of dogs excrete leptospira for a variable period following infection; but since this period is often short, the percentage of dog "carriers" at any one time is probably small.

The clinical features of the present case generally accord with previous descriptions of leptospirosis canicola. The prominence of the renal symptoms, however, is noteworthy owing to the similarity of the disease as it occurs in dogs, but in the human case there is no evidence of a developing chronic nephritis. One cannot tell if the brief recurrence of nephritic symptoms is ascribable to the previous leptospiral disease. The dramatic change in the clinical condition following penicillin treatment is interesting and is in accordance with the experimental work of Larson and Griffitts (1945). On the other hand, a similar clinical course has been observed in patients where no specific therapy has been used. The disease is naturally self-limiting, and therefore no claim can be made for a specific therapeutic effect of penicillin.

SUMMARY

A case of leptospirosis canicola in a boy is ascribed to bathing in the Thames.

The diagnosis was established by the demonstration of a rising serum antibody titre to *L. canicola* during the course of the illness and by absorption tests with homologous and heterologous strains of leptospira.

The patient was treated with 220,000 units of penicillin, and dramatic clinical improvement followed.

REFERENCES

Aalvik, T. (1946) *Nord. Med.* 30, 749.
Bruno, F. E., Wilen, C. J. W., Snavely, J. R. (1943) *J. Amer. med. Ass.* **123**, 519.
Buckland, F. E., Stuart, R. D. (1945) *Lancet*, ii, 331.
Davidson, L. S. P., Campbell, R. M., Rae, H. J., Smith, J. (1934) *Brit. med. J.* ii, 1137.
Dhont, C. M., Klarenbeek, A., Schüffner, W. A. P., Voet, J. (1934) *Ned. Tijdschr. Geneesk.* 78, 5197.
Gardner, A. D. (1943) *Lancet*, ii, 157.
Gispen, R., Schüffner, W. (1939) *Zbl. Bakt.* **144**, 427.
Klarenbeek, A. (1938) *Ibid*, **142**, 83.
— Voet, J. (1933) *Ned. Tijdschr. Geneesk.* **77**, 398.
Larson, C. L., Griffitts, J. J. (1945) *Publ. Hlth Rep., Wash.* **60**, 317.
Peterson, C. B. (1938) Tropical Congress, Amsterdam (see Gispen and Schüffner 1939).
Raven, C. (1941) *J. infect. Dis.* 69, 131.
Stuart, R. D. (1938) *Lancet*, i, 603.
— (1946) *Vet. Rec.* 58, 131.
Tievsky, G., Schaefer, B. G. (1944) *Med. Ann. Dist. Columbia*, 13, 11.
Tiffany, E. J., Martorana, N. F. (1942) *Amer. J. Hyg.* 36, 195.
Walch-Sorgdrager, B. (1939) *Bull. Hlth Org. L.o.N.* 8, 143.
— Schüffner, W. (1938) *Zbl. Bakt.* **141**, 97.

". . . Of course there are important differences between the medical profession and the university teaching profession. I think the main difference is that the medical profession has, on the whole, to work a good deal harder, also it has to work at less regular hours, and, on the whole, its job is not so pleasant because there are many patients who are not quite so attractive to deal with as the young men and young women in universities. For that very reason, I personally think you ought to pay the medical profession better than you pay the teachers. It would be quite easy to do that without paying them very much."—Lord BEVERIDGE, *Hansard*, Oct. 9, par. 94.

MALIGNANT GRANULOMA OF THE NOS

S. W. G. HARGROVE
M.B. Camb., F.R.C.S.E., D.L.O.
SENIOR SURGEON, EYE, EAR, AND THROAT HOSPITAL, SHROPSHIRE AND MID WALES

J. H. FODDEN
M.D. Leeds
ACTING PATHOLOGIST, ROYAL SALOP INFIRMARY, SHREWSBURY

A. J. RHODES
M.D. Edin., F.R.C.P.E.
LECTURER IN BACTERIOLOG, LONDON SCHOOL OF HYGI

PROGRESSIVE ulceration of the nose, palate, and w of the antrum, known to ear, nose, and throat surgeo as malignant granuloma of the nose (Woods 1921), wa probably first described by McBride in 1896 (see McBrid 1926); and about a dozen cases have since been published (Woods 1921, McKenzie 1922, McArthur 1925, Chatellier 1929, Kraus 1929, Goodyear 1930, Stewart 1933, Hall 1933, Dempsey 1933).

The lesion begins on the inferior concha or nasal septum and proceeds to sloughing of the concha and perforation of the septum and hard palate, the ulcerated areas having clearly defined margins. An abscess may form in the soft tissues of the cheek, with perforation of the anterior wall of the antrum. There is usually no regional lymphadenopathy. The lesions are not painful. There is a peculiar odoriferous bloodstained discharge from the affected nostril. The disease is usually rapidly fatal, though the precise cause of death is often obscure.

Bacteriological investigations have not incriminated any pathogenic bacteria, fungi, or protozoa, and Stewart (1933) reported negative results on animal inoculation. The Wassermann and Kahn tests have always proved negative, and there has been a complete lack of response to arsenicals (McArthur 1925). Apart from the local lesions in the nose, mouth, and antrum, necropsies have not revealed any specific changes, though in one of Hall's (1933) cases small nodules of reticulum-like cells were found in the lung and cortex of the kidney.

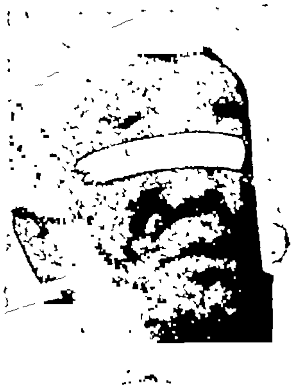


Fig. 1—Perforation of cheek and anterior wall of antrum exposing lateral wall of nose with necrotic anterior end of inferior turbinate bone.

The histology of the local lesion presents the general features of invasion by a cellular granulation tissue, with necrosis of bone and cartilage.

Muir examined McBride's (1926) case and stated that the condition did not correspond to any known type of ulceration, and in particular syphilis, yaws, and tuberculosis could be excluded.

O'Sullivan, examining Woods's (1921) case, reported a zone of granulation tissue extending into the healthy tissue and breaking down behind.

In McArthur's (1925) case, Dew stated that the lesion did not conform to any known type of malignancy though bearing some resemblance to an atypical spheroidal-celled carcinoma.

Kraus (1929) described infiltration of bone and cartilage by a cellular granulation tissue and thought that sarcomatous change had supervened on an infective granuloma.

With regard to the granulation tissue, Chatellier (1929) thought there were resemblances to lupus pernio, and Ewing, examining Wood's (1931) case, thought that the changes resembled syphilis though they were not typical. Case, examining the same material, diagnosed tumour, and Weidman classified the condition as a granuloma.

Stewart (1933) described a round-celled infiltration of granulation tissue, engorged vessels, and scattered hæmorrhages; proliferating blood-vessels showed thickened walls and endarteritis with hyaline changes. Bone was actively destroyed. In o [illegible] the appearances suggested a fibroma.

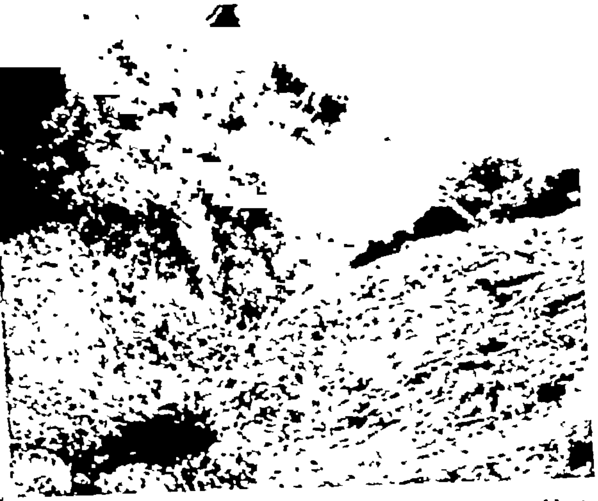


Fig. 2—Photomicrograph of section of ulcerated inferior turbinate bone. Note demarcation between necrosis and slough on the left and myxomatous connective tissue, with its colonies of fibroblasts and capillaries on the right. (×90.)

Opinion seems to be more or less equally divided between describing the condition as an infective granuloma of uncertain ætiology and attributing the changes to a tumour growth.

All forms of treatment have been tried, from chemical cautery and surgical excision to radium implantation and X rays. Woods's (1921) second case was healed by radium needles placed in dental wax upon the ulcer-perforation. McArthur's (1925) case derived no benefit from radium, but showed satisfactory healing after three full doses of X-ray therapy. All other reported cases have been resistant to any form of treatment, and death has usually resulted from a vague cachexia or toxæmia coupled with repeated blood-loss from the lesion.

CASE-RECORD

A farmer, aged 58, was first seen by his doctor in May, 1945, with a history of a neuralgic pain involving the distribution of the second division of the 5th nerve. The teeth were carious, and it was thought that the neuralgia was due to sepsis in the upper jaw. He did not take his doctor's advice to have dental treatment. The first upper right premolar, canine, and lateral incisor teeth fell out during the next four weeks, followed by ulceration and necrosis of the adjacent alveolar margin.

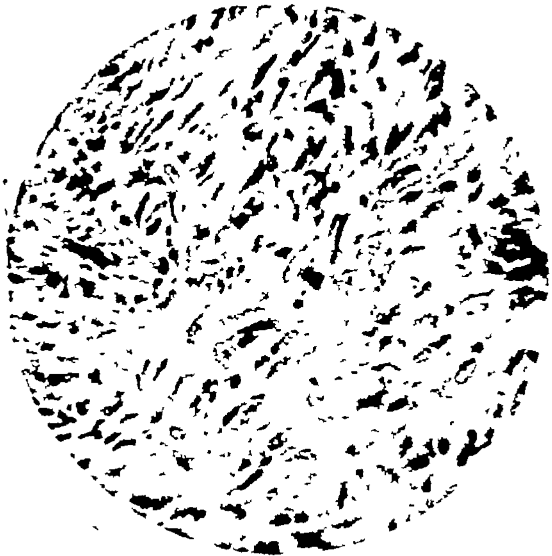


Fig. 4—Photomicrograph of cellular granulation tissue. (×320.)

The ulceration spread along the premaxillary region of the hard palate, destroying the mucosa. This was followed by a sloughing and necrosis of the bone, with formation of a fœtid sinus opening into the floor of the nose.

On August 29, 1945, the patient was seen at the Royal Salop Infirmary, when a hole 1 in. in diameter was found in the premaxillary region of the palate and the alveolar margin. There was also a tender red swelling over the anterior wall of the maxilla. A tentative diagnosis of syphilis was made, but the Wassermann reaction was negative. The patient was told to report in a week but did not, and was sent for on Sept. 17.

On the 19th the patient was seen again as an outpatient. He was cachectic from toxic absorption, with a very pale face, and had a temperature of 100° F. He talked with a nasal voice. The anterior end of the inferior turbinate was covered with a dirty greyish slough blocking the right nasal passage. The lateral wall of the nose beneath the inferior turbinate was eroded, and the whole of the anterior half of the floor of the nose was absent. Necrosis also involved the floor of the antrum. The septum was intact, and the disease was limited to the right nasal cavity. The middle turbinate was not involved.

After the sloughs had been removed from the nose the posterior third of the inferior turbinate was seen to be intact. This was seen with a nasopharyngoscope, it being impossible

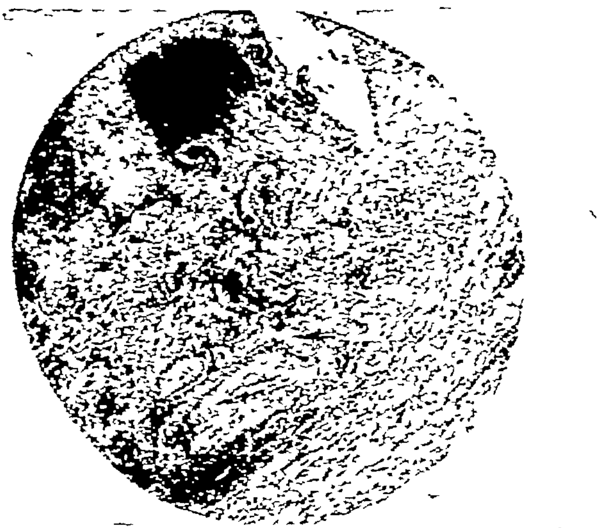


Fig. 3—Photomicrograph showing linear edge between slough on the upper left and granulation tissue. Note obliterating endarteritis. (×60.)

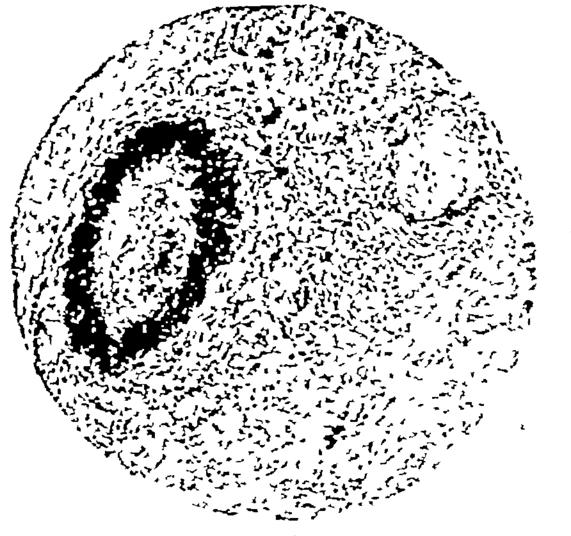


Fig. 5—Photomicrograph showing almost complete occlusion of two arteries. Note thick reduplicated external elastic lamina of the larger artery (orcein stain). (×115.)

to use a postnasal mirror owing to pharyngitis due to pus passing downwards. The bone forming the alveolar margin in relation to the right incisors, canine, and first premolar teeth, the anterior portion of the floor of the antrum, the right anterior half of the hard palate, and the medial half of the anterior wall of the antrum extending into the bony margin of the right nares and upwards towards the ascending process of the maxilla were absent. The floor and anteromedial margin of the orbit were intact.

The antrum contained a blackish-grey slough, which was removed with hydrogen-peroxide swabs. Beneath the slough there was a granulating surface with punctate hæmorrhages. The hole in the face (fig. 1) had a punched-out appearance, and its edges were smooth. The invading edge in the skin was spreading towards the vestibule of the nose medially, the spreading edge being hyperæmic, with a slough on its surface.

The ears and larynx were normal, and there were no glands in the anterior and posterior triangles of the neck.

He was admitted as an inpatient on Sept. 19.

Radiography showed the medial wall of the right antrum bulging into the right nasal fossa. Illumination of this antrum by X rays was normal. The remaining sinuses appeared normal. Radiography of the chest showed kyphoscoliosis (due to infection in childhood).

Treatment.—The cavity was swabbed three times a day with hydrogen peroxide to remove the sloughs, and insufflated with penicillin and sulphanilamide powder.

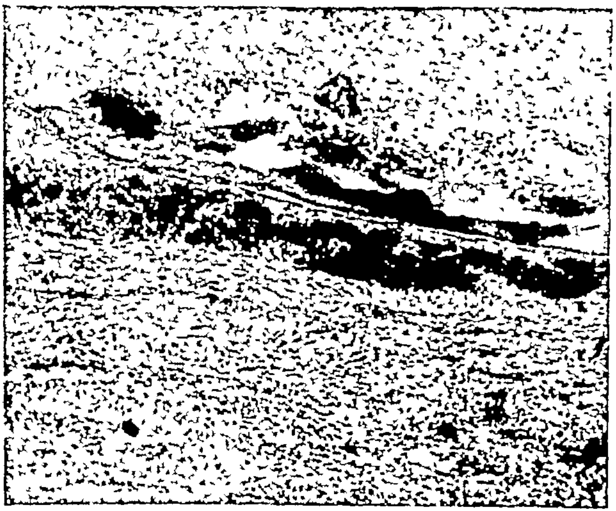


Fig. 6—Photomicrograph showing hæmorrhage and necrosis surrounding spicule of bone. (×90.)

Intramuscular penicillin 25,000 units was given three-hourly for three days. On this treatment the spread of the lesion was arrested, and the patient's condition appeared to be improving slightly; but he caught a "cold" and developed pneumonia, dying on Sept. 25.

Laboratory Findings.—The Wassermann and Kahn reactions were negative on two separate occasions, and the Sachs-Georgi test negative on one occasion.

Six swabs were taken on the 25th from different parts of the affected antrum, with identical results. Films showed numerous gram-positive cocci and diphtheroid bacilli only. Cultures gave growths of hæmolytic streptococci, a non-pathogenic *Staph. albus* (coagulase test negative), and diphtheroid bacilli of the xerosis type. No evidence of tuberculosis, actinomycosis, or mycosis. No growth of anaerobic bacteria.

Necropsy (Sept. 25).—Spine: kyphosis and lordosis presumably due to old-standing tuberculosis, with no evidence of present activity. Brain, skull, and middle ears normal. Right lung congested; some serofibrinous fluid in left pleural cavity secondary to lobar pneumonic consolidation of both upper and lower lobes. Kidneys small and shrunken; capsules stripped with difficulty, the microscopical appearances being those of atherosclerosis. Liver showed cloudy swelling. Remaining organs appeared to be normal. The appearances of the maxilla and face have already been described.

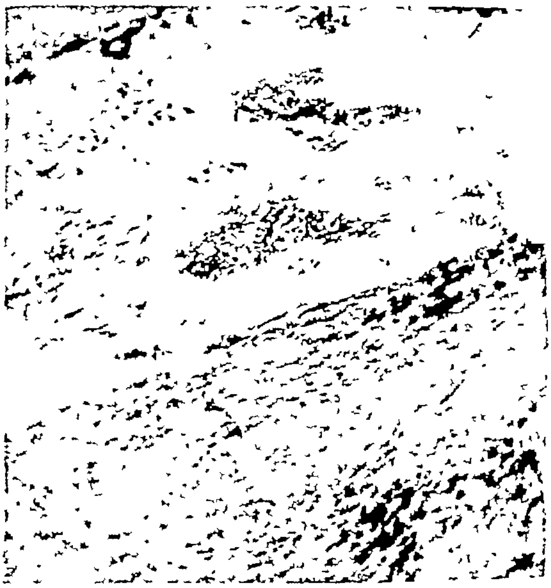


Fig. 7—Photomicrograph of part of same section as in fig. 6, showing fibrinoid type of degeneration which was an early lesion found closely applied to bone (Mallory's fibrin stain). (×160.)

Death was certified as due to lobar pneumonia and toxæmia from necrosis of right maxilla.

Histology.—Several pieces of tissue from the inferior turbinate bone (fig. 2), the hard palate, and the edge of the ulcerated area of the antrum were examined. The appearances throughout were similar, but were most pronounced in the edge of the perforation in the wall of the antrum. The mucosa was ulcerated away, and the surface was formed by a slough, consisting of masses of red cells, polymorphs, eosinophils, and plasma cells. Immediately under this superficial area was a wide zone of necrosis, where the outline of blood-vessels and connective tissue was just recognisable. There were no inflammatory cells in this area.

There was a sharp line of demarcation (fig. 3) between this zone and the next, which showed very cellular tissue (fig. 4) composed of closely packed interlacing fibroblasts and a few capillaries. Deeper still, the fibroblasts were arranged in long parallel lines and there was a moderate amount of collagen. Here also there were tortuous small arteries showing gross pathological changes. The adventitia was not clearly demarcated from the surrounding cellular tissue and showed infiltration with lymphocytes. The media was thickened, and

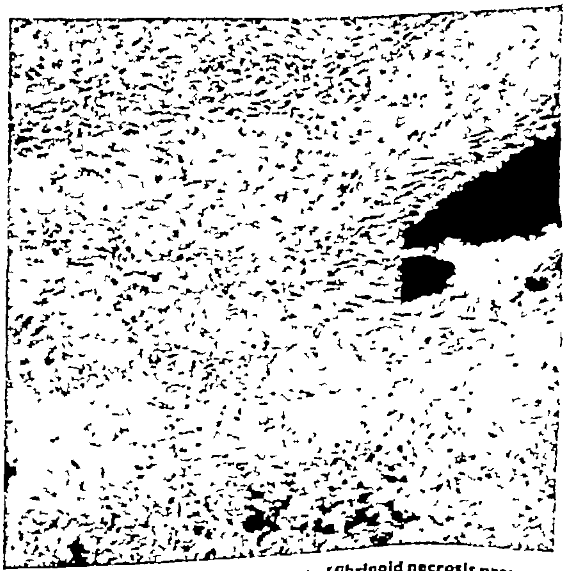


Fig. 8—Photomicrograph showing start of fibrinoid necrosis preparatory to sloughing. A spicule of bone is being isolated (Van Gieson). (×160.)

intima showed irregular proliferation; so the lumen was ost completely obstructed (fig. 5). In some of the arteries external elastic lamina showed much reduplication l a peculiar fragmentation. Outside the vessel wall were lections of red cells within a web of necrotic connective sue. Isolated spicules of bone were not invaded by the roblasts but were surrounded by œdematous fibrous tissue dergoing necrosis (figs. 6–8). There was no evidence of yloidosis.

In sections taken from other areas the necrosis was more early seen to involve bone and periosteum. It extended bands which surrounded the periosteum of isolated spicules d was associated with much hæmorrhage. Here the strucre of the granulation tissue was much less defined, and ere were isolated colonies of fibroblasts separated by yxomatous fibrous tissue, in which were several irregular pillaries. There was no evidence of tuberculosis, syphilis, carcinoma, and no protozoal or fungal elements were seen. Specially stained sections showed the only bacteria to be am-positive cocci and scanty gram positive bacilli in the ater margin of the zone of sloughing. By similar means the resence of more pathogenic bacteria, such as *B. lepræ*, *. mallei*, and spirochætes, either in this zone or deeper ones, as confidently excluded.

DISCUSSION

There seems to be little doubt that the present case as one of malignant granuloma of the nose; the clinical eatures correspond closely to those of previously pubished cases. In our case the lesion began near the ase of the carious teeth. The sloughing of the premaxilla, ith perforation of the hard palate, preceded a spread f the disease to the anterior wall of the antrum and o the inferior turbinate bone. The absence of bleeding rom the lesions was noteworthy. A slight point of ifference in our case from those previously reported as the absence of any gross hæmorrhages, even when arge adherent sloughs were removed.

The most interesting feature of this condition is its etiology. As regards the theory that the condition is nfective, no specific organism, protozoon, or fungus has ever been incriminated. In our case a hæmolytic streptococcus was isolated, but it is not suggested that its rôle was more than that of a secondary invader. In our case, as in the previous ones, the serological tests for syphilis were negative, and the appearances of the diseased cartilage and bone did not suggest any known infection. If the cause is an organism, perhaps a hitherto unidentified one, as suggested by Dempsey (1933), the reaction of the tissue is *unique* among infections, for there is virtually no evidence of the customary cellular defence mechanisms. Thus the necrotic area is sharply defined from the subjacent granulation tissue, but there is a complete absence of inflammatory cells at the interface of these zones. The absence of cellular defence has been emphasised by Stewart (1933) and well exemplified in a case described by Hall (1933).

As regards the theory that the condition is a true tumour, it may be conceded that there are certain arguments to support this view. In some published descriptions specific reference has been made to the similarity of the tissue to that found in fibromata and sarcomata. The failure of the usual treatment of a granulomatous lesion, and the reports of beneficial effects following the exhibition of X rays or radium, may be cited as evidence in favour.

In our case the noteworthy histological features were the presence of necrosis and degeneration, the cellular granulation tissue composed of young fibroblasts, and a process of obliterating arteritis within and behind this cellular zone. Though the histological changes appeared to suggest a new growth, no such tissue was found; the whole process seemed to be an erosion of existing normal tissue. We believe that this can be explained by the coexistence of two pathological changes keeping pace with one another: (1) a locally spreading lesion, the cellularity of which indicated the property of new tissue formation, whether this abnormal tissue be granulomatous or neoplastic; and (2) the obliterating arteritis, to which can be attributed the "fibrinoid" degeneration of the connective tissue with its accompanying small hæmorrhages, and the complete necrosis of more distant tissue. The resultant state was one of infarction; and both normal and abnormal tissues, if the latter were being produced, were afterwards lost in the sloughing of the infarcted area.

SUMMARY

A case of malignant granuloma of the nose in a man aged 58 is described.

The main feature was a rapidly spreading ulcerative condition involving the antrum, nose, and palate.

No specific organism appeared to be responsible, and serological tests for syphilis were negative.

Necropsy disclosed no specific changes apart from the local lesion.

The histological picture was that of an acute granuloma with necrosis.

It is impossible to decide whether the condition was due to an unidentified infection or to an unusual type of sarcomatous change.

REFERENCES

Chatellier, L. (1929) *Ann. Derm. Syph., Paris*, 10, 1213.
Dempsey, P. (1933) *Brit. med. J.* ii, 194.
Goodyear, H. M. (1930) *Ann. Otol., &c., St. Louis*, 39, 598.
Hall, I. S. (1933) *J. Laryng.* 49, 35.
Kraus, E. J. (1929) *Klin. Wschr.* 8, 932.
McArthur, G. A. D. (1925) *J. Laryng.* 40, 378.
McBride, P. (1926) *Proc. laryng. Soc.* 4, 18.
McKenzie, D. (1922) *Proc. R. Soc. Med.* 15, 28.
Stewart, J. P. (1933) *J. Laryng.* 48, 657.
Wood, G. B. (1931) *Trans. Amer. laryng. Ass.* 53, 63.
Woods, R. (1921) *Brit. med. J.* ii, 65.

PSYCHIATRY AT THE CORPS EXHAUSTION CENTRE

TECHNIQUE OF RAPID PSYCHIATRIC ASSESSMENT

F. P. HALDANE
M.B. Glasg., D.P.M.
MAJOR R.A.M.C.

J. L. ROWLEY
M.B. Belf.
CAPTAIN R.A.M.C.

THE corps exhaustion centre was established to prevent psychiatric casualties from impeding the evacuation and treatment of the wounded and sick when fighting was severe; to check secondary deterioration; and to select and deal with the relatively few men who would be fit for early effective return to fighting duties.

The exhaustion centre is a small medical unit staffed by a specialist psychiatrist, a psychiatrically experienced medical officer, and specially trained nursing orderlies. It is attached to another medical unit and so sited that patients can reach it within a few hours of being evacuated from their units.

In dealing with these patients the principal feature is the initial psychiatric interview, which usually has to be restricted to about 15 minutes. Its outcome determines whether the man has a reasonable prospect of effective return to action after not more than four or five days' retention at the centre. If there is no such prospect, he must be evacuated farther.

No elaborate treatment is provided. Arrangements are made to exclude or mitigate various likely sources of deterioration, suitable conditions for recuperation are provided as far as possible, and various adjuvant systems of medication may be prescribed; but recovery is largely spontaneous.

PSYCHOPATHOLOGY

Cases admitted to the corps exhaustion centre can be divided into three main groups, although they are seldom of unmixed type.

(1) *Normally Constituted Men who have Broken Down under Unusually Severe Stress.*—Situations sometimes arise in battle that render psychologically incapacitated for the time being any man involved, no matter how "tough" he may be. We have known all the unwounded survivors of some such incident arrive at the centre. Less intense psychic traumata will break down temporarily a normal man whose resistance is reduced by physical exhaustion or other minor illness. Repeated traumata tend to be cumulative. Other factors may

coöperate. Many of these men respond well to a few days' care at the centre. They constitute a minority of our admissions and are most numerous during heavy major actions.

(2) *Neurotically Disposed Men who have Developed Neurotic Symptoms under Stress.*—Most of these have to be evacuated. We will not discuss the psychopathology of these two groups; it has been discussed fully and often enough elsewhere.

(3) There remains a third group, which has been somewhat neglected. It is larger than the other two and often constitutes the majority of our cases at this level. The men in this group are not ill with a neurosis. They may even show little or no overt anxiety by the time they reach the centre. They may be said to have had their anxiety threshold lowered—a recurrence of the anxiety reaction facilitated. They may be men whose initial "anxiety threshold" was not high, or whose "anxiety tolerance" is low. But "low anxiety threshold" and "low anxiety tolerance" are not neuroses. Probably some of these men would develop neurotic symptoms if forced to continue in fighting duties, but they are not yet neurotic. They are simply men who have been badly frightened and are habitually too incapacitated by fear to be capable of effective action under fire. But their fear is appropriate to the conditions in which it arises; it is not pathological.

Some stigmatise these men as simply lacking in "guts." While deploring the emotional and subjective attitude implied in the use of the term "gutlessness," we have to admit that the reality concealed behind this appellation is the central factor in this type of psychiatric casualty and has to be estimated at the psychiatric interview.

These men may be evacuated from the line as casualties because, during a period of special stress, they have broken down, weeping and trembling and obviously unable to control themselves; they may be sent for psychiatric examination because their officers have found them to be useless and even burdensome "passengers"; or they may be sent for a psychiatric report because they are facing trial by court martial for desertion in face of the enemy. In its crudest form their disability manifests itself in the following features, which appear with the presence or threat of severe danger: inability to advance, inability to refrain from flight, inability to take appropriate action, inability to refrain from taking inappropriate action—they may leap from their trenches and rush about wildly while mortar bombs are bursting around, sometimes even rushing towards instead of away from the enemy's guns—or inability to appreciate clearly what is going on round them. These features may appear singly or combined. One or more may predominate in a given man. They have an impaired capacity, on the one hand, to maintain contact with reality and, on the other hand, to control their impulses in accordance with reality requirements. In other words, their basic ego-functions are involved. These men suffer from inadequate development of the ego. That is their essential disability. Accordingly, the main task of the psychiatric interview at the centre is to estimate the strength of the patient's ego.

TECHNIQUE OF RAPID PSYCHIATRIC ASSESSMENT

We have to provide for men who have no neurotic illness a 15-minute psychiatric interview which will reveal any subclinical neurotic trends and enable us to estimate the strength of the patient's ego. The taking of a standard psychiatric case-history is of very limited value and takes far too much time.

The ego is developed in childhood, especially in early childhood. It depends on the strength and constitution of the instincts, the anxieties and tensions connected with them, and the mechanisms used to master them, and is influenced by external conditions, especially the family pattern, the emotional attitudes and behaviour of the parents and others, and the social tensions within the home. But simple information about these external conditions tells us very little about the ego's development or of the strengths and weaknesses of the total personality. These external influences do not act in a direct mechanical way on the growing child. What is important is to know not that the father was harsh but exactly how the child interpreted this harshness; what phan-tasies he based on it; with what attitudes of submissi or revenge he reacted; what forms of identifications, introjections, and projections it stimulated; wha particular anxieties were aroused, and how they were dealt with; how all these and other processes influenced one another; how they influenced the general econom situation; and, in particular, how they advanced o retarded the adaptation of the ego to reality. The processes are detailed and complicated. They lie obscurely buried, largely in non-verbalised forms, in the depths of the patient's unconscious. They are protected by an elastic defence in depth of many and varied resistances, each of which would require painstaking, time-consuming, and patient efforts to breach. In short, their thorough assessment would require a prolonged and skilled analysis, which is obviously out of the question at a corps exhaustion centre.

We therefore had to devise a method compatible with a single interview lasting 10–15 minutes. The method we have adopted developed from our recognition that, after working laboriously through our routine examinations, we were really influenced very little by the facts we elicited from the patient. What really decided our disposal of him was our intuitive judgment of his personality, based on his appearance, manner, and behaviour throughout the interview.

Psychiatric intuition, to be reliable, requires the maximum of behavioural activity from the patient, so that its judgments may be adequately grounded. This in turn requires the establishment of good rapport—i.e., some degree of positive transference. The adoption of any stereotyped systematic technique, approaching in any way a questionnaire, militates against the establishment of these necessary conditions; by its rigidity and its impersonality it reduces transference, and by increasing the activity of the psychiatrist it reduces that of the patient.

On the other hand, the value of intuition has serious limitations. It will vary from one psychiatrist to another and even from day to day in the same psychiatrist. The interview must be so conducted that the patient will provide the richest display of behaviour suitable fo the stimulation of psychiatric intuition, along with th maximal content suitable for rational evaluation i terms of ego strength.

The function of the ego is the integration of emotiona attitudes and behaviour so as to ensure the greatest advan-tages in relation to environment and to avoid painful intra-psychic tension. Successful function of the ego therefor depends on extensive and accurate testing of reality and o competent control of conscious and unconscious psychic force . The weak ego manifests its weakness in its relative failu in these various directions. Contact with reality is too limite insufficiently firm, and incoherent; the individual's behaviou is poorly integrated and too strongly swayed by unconsciou motives and instinctual demands. The positive finding would include, for example, restriction of range of interests deficiency of externally directed activity, either habitual o in the face of real difficulties; more or less complete loss o contact with reality under special stress, followed by undu delay in full resumption of reality testing; diffusion of effor through inconstancy or incompatibility of aims; decrease ability to postpone satisfaction of desires or to tolerate thei frustration; and a general lack of good sense in the conduc of affairs. Such findings justifiably support the decision th a patient's ego is excessively weak.

The interview is simply a short conversation with th patient, in which we ensure that he does very muc the greater part of the talking. We open it with som commonplace greeting and let it take its course, guidin it as unobtrusively as possible to the subjects we thin will be most helpful. So long as the topic is effective i stimulating affective and other responses from th patient, we allow or urge him to continue. So soon a we feel we have exhausted the fruitfulness of any topic we intervene, as easily and as naturally as possible, t change the direction of the deliberately one-sided con-versation. Any topic may be found suitable. We may induce him to discuss his sources of pleasure and enjoy-ment or his difficulties in civil or in Army life, his inter-ests, his family relationships, other domestic matters, &c. We do not set ourselves to cover any particular ground;

and in general it is very much better to get a vivid and detailed account of some limited aspects of his experience than to spread the inquiry more broadly and so get more superficial responses.

In our experience one topic has usually occupied the foreground of our interviews, and it is one that, along with family matters, is most liable to be spontaneously introduced by the soldier. It is also especially relevant to our more specific aims. This is an account of his latest battle experience. We try to get it as full and as detailed as possible, trying in particular to gain the maximal insight into his affective responses to battle, his particular fears and his defences, and the quality of his behaviour on the battlefield. Because of the freshness of our cases, the affective responses are often more accessible to study here than they would be farther back along the line of evacuation; many of our patients, when they reach the exhaustion centre, still show the tail-end of the physiological anxiety reactions that were stimulated in battle.

Such an interview gives us information on the existence and importance of "neurotic increments" which may be indicated by accounts of subclinical neurotic reactions, such as avoidance of quarrels or excitement, nervousness in company, difficulties with superiors, excessive fearfulness in the dark, &c. But, most important of all, it gives us a short sample of the patient's active living behaviour, on which we can base our intuitive assessment, the most decisive factor in deciding our disposal of the case.

CRITICISM

The technique we have described is open to a number of objections. We shall mention only three that seem important.

(1) Our intuitive judgment of the patient is not really a direct assessment of the strength of his ego. What we gain is an impression of his personality, his externally perceptible qualities. We do not know what relationship exists between ego and personality in this sense. We have taken an impression of weakness of this personality as an indication of the weakness of the ego. This is an assumption without theoretical backing.

(2) We have treated weakness of the ego as a unitary condition. It is probably not so. Weakness of one set of ego functions does not necessarily imply weakness of all the others. Thus, because a man has excessive difficulty in restraining the desire for flight, it does not follow that he is excessively prone to lose touch with reality under stress. This is obviously very relevant to the decision about his disposal.

(3) Finally, weakness of the ego is probably much more variable than, for instance, weakness of the intellect. The ego may be fortified by such factors as good unit morale and leadership. It is therefore difficult to decide what degree of apparent weakness precludes operational effectiveness.

In spite of these and other shortcomings we think that this is about the best that we are at present able to do in so short an interview. We get a rough but clearer and probably more accurate picture of the patient and a fuller insight into his military effectiveness than results from adherence to the standard routine of attempting to take a full psychiatric case-history in the time available.

We hope that the method here described may be of some use to civilian psychiatrists. With the increased demand for psychiatric services that seems likely to arise now that peace has returned, it may well be that, for some time at least, similar superficial methods may be required. Even apart from this, occasions arise when we wish to gain a quick picture of our patient at our first interview, and some appraisal of the ego strength is necessary in deciding the form of therapy and in making a prognosis.

Cases seen at the front are in an emotional state which renders the "impressionistic" technique indicated especially fruitful. This is far less so in cases seen under ordinary circumstances. However, it still seems worth while to draw attention to the ego functions, to the importance of assessing their effectiveness, and to the general lines of inquiry along which such an assessment may be conducted.

SUMMARY

The nature and functions of the forward military psychiatric unit (corps exhaustion centre) are described.

Cases seen comprise (1) normal men who have broken down under excessive stress, (2) neurotically predisposed men who have developed neurotic symptoms under stress, (3) men who merely do not function effectively as soldiers under stress.

The psychopathology of the third group is discussed. Weakness of the ego is considered to be the essential defect.

The most suitable technique for a psychiatric interview aimed at assessing ego strength and restricted to 10–15 minutes is discussed. Reliance on psychiatric clinical intuition as the main decisive factor is recommended.

Our thanks are due to Brigadier J. H. Bayley, D.D.M.S. 5 Corps, for permission to publish this paper.

MALTED FOODS FOR BABIES

TRIALS WITH YOUNG RATS

HARRIETTE CHICK E. B. SLACK
C.B.E., D.Sc. Lond. and Manc. B.A. Camb.
From the Lister Institute of Preventive Medicine, London

A MALTED food for infants to provide a supplement or substitute for milk, when this is very scarce, was by Dr. G. Caprino in the laboratories of Peroni's brewery in Rome and was called by him 'Maltavena.' His formula was brought to the notice of the health division of the European Regional Office of UNRRA, at whose request we have tested on young growing rats the value of such mixtures as sources of proteins and B vitamins.

The maltavena preparations supplied to us were of two types: one containing, on a solids basis, extract of malted barley about 80%, wheat flour (80% extraction of the grain) about 10%, and skimmed-milk powder about 10%; the other containing 10% soya flour in place of the milk powder. Both the wheat flour and soya flour had also been subjected to digestion with the enzymes of malt extract for a short time. Of the materials tested in the following experiments, two, A and C, were of the first type, and three, B, D, E, contained soya flour; their percentage composition was approximately as follows:

Maltavena preparation	*Malt extract*	*Wheat flour*	*Soya flour*	*Skimmed-milk powder*
A	80	10	—	10
B	80	10	10	—
C	80	10	—	10
D	80	10	10	—
E	70	10	10	10

All were supplied in the dry form and were ground to a fine powder before being fed to the rats.

EXPERIMENTAL

The criterion adopted was the capacity to support growth in newly weaned rats. For this purpose, diets were constructed which consisted mainly of the malted food to be tested and their value was estimated in comparison with that of diets containing a similar percentage of protein derived from milk powder. The proportion of protein, carbohydrate, and fat was similar in all the diets on which growth was compared.

The following procedure was adopted in all the experiments quoted unless otherwise stated. The young rats (Lister pied strain) received the experimental diets a few days after weaning, when their body-weight was about 40–50 g. Litter mates were divided into groups of equal average body-weight, with equal distribution of males and females, and to these groups were allotted the different diets to be tested. To provide a standard for comparison, each experiment included a control group maintained on a diet containing an equal content of protein derived exclusively from skimmed-milk powder. The diets made with the malted foods contained about 90% of these materials, with 2% of a salt mixture

TABLE I—COMPOSITION OF DIETS (PARTS PER 100 g.)

Material	Expt. II			Expt. III			
	Diet 3	Diet 4	Diet 5*	Diet 6	Diet 7	Diet 7a	Diet 8*
Maltavena C ..	89	..	..	85	..	..	..
Maltavena D ..	..	89	..	..	85·5	88	..
Extra soya flour..	..	..	..	..	..	6·1	..
Extra milk powder	10	9	35	11	7·9	..	31
Lard	..	..	..	3·4	1·8‡	0·4‡	4·0
Sucrose	..	..	64	..	4·4	4·4	64
Salt mixture† ..	0·9	0·9	1·0	0·9	0·9	1·7§	1·0
Average nitrogen content (% on air-dry wt.) ..	1·70	1·77	1·79	1·74	1·77	1·67	1·65

* Milk control. † McCollum's no. 185.
‡ These amounts were given to bring the total to about 4%; the soya flour contained 22% fat.
§ Extra salt mixture added as diet 7a contained no milk powder.

(McCollum's no. 185); in some trials extra fat was added to bring the total up to about 4%. In the experimental diets the malted food provided the protein and the carbohydrate; in the milk-powder control diets sucrose was added to make a corresponding proportion of carbohydrate. The composition of some representative diets is shown in table I.

Each rat received daily 2 drops of cod-liver oil, to supply vitamins A and D, and (except in experiment IV) 1 c.cm. of a protein-free aqueous yeast extract (=0·5 g. of dry yeast), to provide B vitamins. The proportion of nitrogen, reckoned on a solids basis, was arranged to be about the same in the diets compared in any one experiment; it varied in the different trials from 1·6% to 1·8%, representing about 9·5–11·0% of "crude" protein. These amounts are suboptimal for the growth of young rats and were purposely so arranged to ensure that the protein content was the factor limiting growth. All other essential nutrients were present in adequate amounts.

Expt. I.—In this test comparison was made of the nutritive value of the protein and other nitrogenous substances present in maltavena A and B. The diets 1 and 2, incorporating products A and B respectively, as fed to the rats, contained 1·6% of nitrogen, or about 9·6% of crude protein. The control diet with skimmed-milk powder also contained 1·6% of nitrogen.

The rats on diet 2 thrived better than those on diet 1, but less well than those on the control skimmed-milk-powder diet. The rats on the control milk-powder diet developed a scaly condition of the skin on paws and tail after about seven weeks owing to the lack of unsaturated fatty acids. The condition improved with the addition of 4% of lard. Rats receiving soya flour (diet 2) had no skin affection, because the fat in the soya bean contains a high proportion of unsaturated acids (Durkee 1936).

Expt. II.—The malted products C and D tested in this experiment and in experiment III had a total nitrogen content of 1·3–1·5% on the dry weight, which is too low for a satisfactory test with young rats. Accordingly 10% of skimmed milk powder was added to each. In this way the percentage of nitrogen in diets 3 and 4, made with these two products respectively, was raised to 1·7–1·8% (the crude protein being 10–11%). The milk-powder control diet 5 was arranged to correspond (see table I).

This increase in protein content was accompanied by a better rate of weight increase than in experiment I. On diet 4, containing maltavena D with soya flour, the rats progressed almost as well as on the milk-powder control diet; the performance on diet 3 was inferior. The average weekly weight increase in 32 days on diets 3, 4, and 5 was, respectively, 10·0, 13·6, and 13·9 g. (see figure).

Expt. III.—In this test lard was added to each diet in amount to make the proportion about 3·5% in the diet (see table I). The performance of the young rats was compared on diets 6 and 7 (table I), which contained the malted products C and D respectively, after the addition of extra milk powder to each, as in experiment II. An additional diet, 7a, was tested, in which 6% of soya flour was added to maltavena D to provide an amount of nitrogen equal to that in the extra milk powder. The control diet 8, with all protein derived from the milk powder, was included in the experiment.

In all groups the rate of weight increase was satisfactory, in view of the low level of protein in the diets for these rats. With diets 7 and 7a, containing soya flour, growth was as good as with the milk-powder control diet 8, the average weekly weight increases being 15·5, 14·4, and 14·6 g. respectively. On diet 6, containing malt extract with wheat flour and skimmed milk powder, the weight increase was less (average weekly increase 12·8 g.) in spite of the fact that about half of the protein was derived from milk protein (see table II).

It may be concluded that the growth-promoting value of the mixture of proteins of malt extract, wheat, soya flour, and milk as contained in diet 7, and that of the mixture of those of malt extract, wheat flour, and soya flour as contain in diet 7a, were equal to the value of milk proteins.

TABLE III—EXPT. IV (DURATION OF TEST 49 DAYS)

Diet 9	Composition (parts per 100 g.)	—	No. of rats	Av. body-weight (g.)		Av. week increa (g.)
				Initial	Final	
Maltavena E	94	With yeast extract 1 c.cm. daily	4	44	139	13·
Salt mixture	1					
Lard ..	4	Without yeast extract	4	43	132	12·
Nitrogen content (%)	1·7					

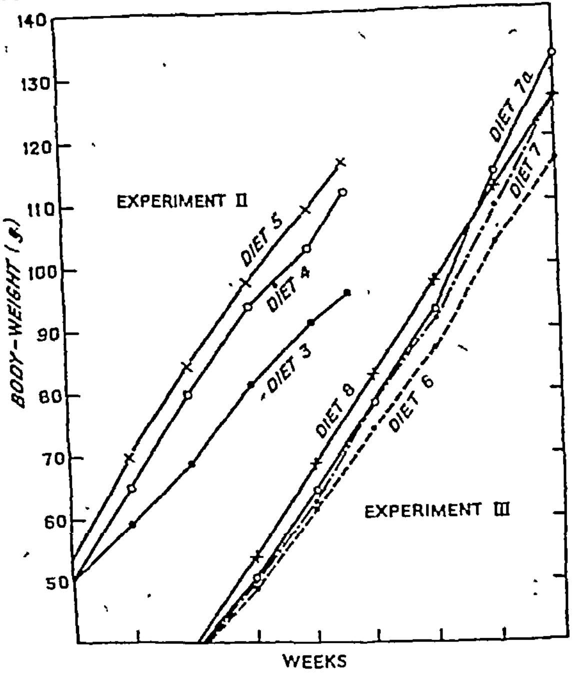
Expt. IV.—Extracts of malted barley and the soya bean a both known to be good sources of B vitamins. For this te diet 9 was composed of maltavena E with salt mixture a lard; the nitrogen content of the diet was 1·7% (see table II

A single litter of newly weaned rats was divided into tw groups of 4 rats; both groups received this diet with the usu daily dose of 2 drops of cod-liver oil. One group receiv additional B vitamins as 1 c.cm. of yeast extract daily; th other group received none. After seven weeks there was slight, but doubtfully significant, advantage in the averag body-weight of the rats on extra B vitamins, the respecti figures for the two groups being 139 and 132 g. and the averag weekly increases 13·6 and 12·7 g.

TABLE II—EXPT. III (DURATION OF TEST 6 WEEKS)

Material tested	Diet no.	Av. nitrogen content (%)	Protein (N × 6) content (%)	Percentage (approx.) of protein derived from—				No. of rats	Body-weight (av.	
				Malt extract	White flour	Soya flour	Skimmed-milk powder		Initial (g.)	Av. weekl increase per rat (g.)
Maltavena C* + extra skimmed-milk powder 10%	6	1·74	10·4	32	10	..	58	6	39·5	12·8
Maltavena D* + extra skimmed-milk powder 10%	7	1·77	10·6	34	11	30	24	5	39·0	15·5
Maltavena D* + extra soya flour 6%	7a	1·67	10·0	34	10	56	..	6	39·7	14·4
Milk-powder control diet	8	1·65	9·9	..	..	..	100	6	38·2	14·6

* See table I.



Average weight curves of 5-6 rats on diets in which nitrogen was derived from the malted preparations, compared with those of rats on control diets containing an equal proportion of nitrogen derived from milk. For particulars of diets see tables I and II. Diets 5 and 8 are milk-powder control diets.

This result indicates that maltavena containing soya flour, if used for baby food, would not need supplementation with food yeast or synthetic B vitamins.

DISCUSSION

The results of the tests indicate that a combination of malt extract about 70 parts, wheat flour about 10 parts, and soya flour about 16 parts (on a solids basis) possesses a mixture of proteins whose growth-promoting value for young rats is about equal to that of the proteins of milk. When 10 parts of skimmed-milk powder replaced about half of the soya flour, the growth was not increased to a significant extent (experiment III). It is concluded that the enhanced worth of the mixture is due to the supplementary action for one another of the proteins contained in the different ingredients. The proteins of the soya bean, in common with those of other legumes, have been shown to have a supplementary effect for those of rice or of white wheat flour (Indian Research Fund Association 1946; Jones and Divine 1944). We have confirmed this fact for white wheat flour and the sample of soya flour used in the manufacture of the foods tested in the present work (Chick and Slack 1946). It is possible that the protein in the malt further supplements those in the wheat and soya flours. Everson et al. (1944) have shown that the nutritive value of soya protein is increased by germination of the beans. We, however, did not find any enhancement of the growth-promoting value of barley after malting.

With the experimental rats in the present work, better growth and healthier animals were obtained when the diet contained about 1·8% of nitrogen or about 11% of crude protein (on a solids basis) than when the proportion was lower. The human baby, however, with its much lower growth-rate, presumably requires less protein in its diet than the rat, judging from the low proportion of protein in human milk compared with that of the rat. But since the biological value of the proteins in human milk may be greater for the human infant than that of any artificial mixture, a proportion of about 11% of protein in the diet would not seem too high.

The composition of these malted foods was originally so arranged that, when diluted for consumption, it should equal that of human milk in calorie value and in content of proteins and total minerals, and the results of our experiments indicate that the maltavena preparations containing about 16% soya flour, owing to the supplementation *of the various proteins contained* in the constituents, may meet the protein requirements of an infant and provide a sufficient supply of B vitamins.

Maltavena, however, even when compounded with soya flour in the amount included in diet 7a, is very deficient in fat (possessing about 1/6 of that in human milk) and in fat-soluble vitamins. The latter can be easily supplied by a small dose of cod-liver oil. To what extent the fat in a food for infants can be replaced by an isodynamic equivalent of carbohydrate is uncertain. Owing to milk shortage in Vienna during the war of 1914–18 attempts were made at the University Kinderklinik to feed babies on dilute skimmed cow's milk to which sugar was added to bring the calorie value up to that of human milk. These results were unsatisfactory, but the importance of fat-soluble vitamins was not appreciated at that time. As a routine measure the director, Prof. C. von Pirquet, reduced the fat in the diet of the babies in the clinic to half and substituted an amount of cane-sugar of equal energy value. The infants thrived during the summer on this diet, but developed rickets in the winter; the addition of cod-liver oil prevented the rickets (Chick et al. 1923).

Only clinical trials can decide whether the human infant will thrive on a diet which, though containing enough good protein, suitable carbohydrate, and the necessary minerals and vitamins, has a fat content which is only a small fraction of that in its natural food.

CONCLUSIONS

The nutritive value of the proteins contained in the different samples of maltavena received, and in modifications of these, was measured by their power to support the growth of young newly weaned rats, in comparison with that of milk proteins.

Of the mixtures tested, the one *containing malt extract* 70%, wheat flour 10%, soya flour* 10%, and powdered skimmed milk 10%, with total nitrogen about 1·8%, proved the most advantageous. The combined supplementary action of the different proteins it contained rendered the mixture equal in growth-promoting value to the mixture of proteins in milk, when fed in a diet of equal nitrogen content.

Though the mixture of malt extract with wheat flour 10% and soya flour 16% was as efficient as that in which skimmed-milk powder 10% was substituted for about half the soya flour (experiment III), it would seem safer, on general grounds, to include a small proportion of milk powder in any infant food.

We wish to thank Glaxo Laboratories Ltd. and Ovaltine Research Laboratories (A. Wander Ltd.) for the supply, on behalf of UNRRA, of the maltavena preparations; Mr. G. W. Flynn for his technical assistance; and Sir Charles Martin for his hospitality at Roebuck House, Cambridge, where the work was carried out, and for his constant support and helpful criticism.

REFERENCES

Chick, H., Dalyell, E. J., Hume, E. M., Mackay, H. M. M., Smith, H. H., Wimberger, H. (1923) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 77, part II.

— Slack, E. B. (1946) unpublished work.

Durkee, M. M. (1936) *Industr. Engng Chem.* 28, 898.

Everson, G., Steenbock, H., Cederquist, D. C., Parsons, H. T. (1944) *J. Nutrit.* 27, 225.

Indian Research Fund Association (1946) *Spec. Rep. Indian Res. Fund Ass.* no. 13.

Jones, D. B., Divine, J. P. (1944) *J. Nutrit.* 28, 41.

Mackay, H. M. M. (1940) *Arch. Dis. Childh.* 15, 1.

---

* Soya flour is well provided with calcium and phosphorus, containing about two-thirds of the amount present in dried cow's milk, but there is less calcium than phosphorus, whereas in milk the reverse is true. Many workers using soya flour for infant feeding have therefore added a small amount of a calcium salt (see Mackay 1940).

Reviews of Books

Child and Adolescent Life in Health and Disease

W. S. CRAIG, B.SC. Glasg., M.D. Edin., F.R.C.P.E., formerly first assistant in the department of child life and health, the University of Edinburgh; with a foreword by Prof. Charles McNeil, F.R.C.P. Edinburgh: E. & S. Livingstone. Pp. 667. 25*s.*

THIS book appears appropriately at a time when the child-health services are under review, and when pædiatrics is taking an increasingly important place in the training of both medical students and postgraduates. Professor Craig has divided his comprehensive work into four main sections and a number of appendices. The first part, which is historical, deals with the early development of systematised care for children from the haphazard and often chaotic results of private philanthropy and poor-law administration. The second, and major, part deals with care of child life at the present time. This section includes particulars of organisations dealing with homeless children, provisions for juvenile delinquents and for handicapped children, the maintenance of health, treatment of the sick, and care of children under conditions of total war. The third section, on "the spirit of future endeavour," is surprisingly slight considering the importance of the subject, and barely touches many of the problems suggested by the subtitles. Finally there is a first-class summary of the more important legislation dealing with child health and care. Where there is so much to praise, it is perhaps mere carping to suggest that there are rather too many pleasing studies of child life among the illustrations. Regarded as a social study, the book is unique at present and contains a great deal of information not readily accessible elsewhere. It should be useful both to the public-health worker and the clinician concerned with child health.

The Osseous System

VINCENT ARCHER, M.D., professor of roentgenology, University of Virginia. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 320. 33*s.*

THIS is the fourth of a series of six handbooks on radiological diagnosis. It is well produced with many good illustrations of the common bone diseases and abnormalities. The text is brief and to the point and references between text and illustrations are very easy to follow. These handbooks are a cross between an atlas and a textbook—a difficult species to breed with success. This one is a success because rarities are omitted and emphasis is placed on common mistakes observed over a period of twenty years in a teaching hospital. The best section is on bone abnormalities in childhood, and the book can be heartily recommended to students studying for a radiological qualification.

Tropical Nutrition and Dietetics

(2nd ed.) LUCIUS NICHOLLS, M.D. Camb. London: Baillière. Pp. 370. 27*s.* 6*d.*

NUTRITION in the tropics differs but little from nutrition in temperate regions as regards the quantity and the quality of the food which is essential to preserve health; the differences lie chiefly in the fact that the inhabitants of the tropics eat foods which differ in their composition from those eaten in temperate regions. There have been very few investigations in the tropics concerning whether more or less of any dietary constituent is required to maintain the body in a state of good nutrition, but a book of this kind should review them. The increased requirement of sodium chloride in the warmer parts of the tropics is lightly passed over, however, and the severe deficiency arising in heat exhaustion is not mentioned. In all who live in the tropics the basal metabolic rate is believed to be reduced by some 10%; but none of the published observations on this important point are specifically mentioned.

The author shares the belief of some other doctors in the tropics that the indigenous people need less food, though no colour bar has been detected in the field of human nutrition. Thus he affirms that an adult male labourer in the tropics, in view of the fact that he weighs only 52 kg. (almost certainly because he is poorly nourished), needs only 1500 calories for basal metabolism, 600 calories for minor activities outside his working hours, and 400–500 calories for his work. His protein requirements, however, are set at 65 grammes and his fat requirements at 50 g.—both liberal estimates. Other requirements are assessed at calcium 0·5 g., iron 8 mg., vitamin A 1800 units, nicotinic acid 20 mg., ascorbic acid 40 mg., and thiamine 0·4 µg. for each non-fat calorie. Some of these figures are distinctly low when compared with those which are generally accepted in other parts of the world. The discussion on the vitamins and minerals is otherwise detailed and accurate; the section on thiamine and beriberi is exceptionally good, largely because in this field workers in the tropics have made a unique contribution to knowledge. Such effects of protein deficiency as nutritional œdema, however, are too briefly discussed, and there is almost no mention of necrosis of the liver or of cirrhosis. Casein hydrolysates and the administration of plasma are not mentioned; kwashiorkor is dismissed as of no account; and nutritional iron-deficiency anæmia is considered to be almost an impossibility in the male.

The tables on the analyses of tropical foodstuffs are useful and accurate, but the approximate wastage in preparation might have been indicated. The discussions on the different tropical foodstuffs and public-health aspects of nutrition are some of the best in the book. On the whole Dr. Nicholls fairly presents what is known in the field of tropical nutrition, but sometimes fails to discriminate between the established facts—all too few—and the speculations—all too many.

Evolution of Plastic Surgery

MAXWELL MALTZ, M.D., SC.D. New York: Froben Press. Pp. 368. $5.

IT was a happy inspiration of Dr. Maltz to give us an outline of the history of plastic surgery from primitive times to the present day. Reparative surgery began in the hard school of war, and today ample scope has been given for the skill of modern surgeons, especially in facial plastic surgery—though some of the new modern methods are but refinements and improvements of the old. The Greeks and Arabs made little contribution to the evolution of plastic surgery. In the 10th century the Jews gained fame as physicians and surgeons but in 1267 the Council of Venice prohibited Jews from practising on the body of any Catholic believer, and the study of anatomy was likewise forbidden. During the Middle Ages plastic surgery languished, for the Fathers of the Church regarded anything pleasing to the eye as a temptation of the devil. It was only after the foundation of Salerno University that the Italian physicians revived surgical art in modern Europe. The University of Bologna followed, where in the 16th century the great Tagliacozzi—sometimes called the father of plastic surgery—arose and gave his name to an operation for rhinoplasty. General and local anæsthesia have favoured the evolution of modern surgery. Gillies's use of the direct-flap method is fully described, and the author pays tribute to his brilliant pioneer work and that of Vilray Blair of the United States.

Pneumoperitoneum Treatment

A. L. BANYAI, M.D., F.A.C.P., associate clinical professor of medicine, Marquette University, Milwaukee. London: H. Kimpton. Pp. 376. 33*s.*

OUTSIDE the world of pulmonary tuberculosis pneumoperitoneum is generally known as an occasional diagnostic and therapeutic measure. The use of intraperitoneal oxygen or air in the treatment of tuberculous peritonitis dates back 50 years, but it is only in the past few years that the indirect effects of pneumoperitoneum on the lungs have been used at all extensively. The air in the abdomen pushes the diaphragm up into the chest, and thus affects the capacity of the thorax. When used in conjunction with paralysis of the phrenic nerve the elevation of the diaphragm can be considerable and is a valuable addition to collapse therapy. It is usual to use pneumoperitoneum in conjunction with phrenic-nerve interruption or artificial pneumothorax, since its effects alone are not extensive enough to be of great value. In a comprehensive and detailed study, Professor Banyai deals with all aspects of the procedure. Generally speaking complications are rare, though peritoneal effusion is sometimes encountered; the risk of damage to bowel is not likely to be overlooked by

LIKE EXPELLING WATER FROM A SPONGE

ŒDEMA due to cardiac failure

Control of œdema lightens the work of the failing heart. Digitalis and other cardiac tonics can again show beneficial action.

Using 'Salyrgan,' dropsical accumulations are rapidly drained from the tissues and œdema is kept at a minimum. The preparation may be administered either in ampoule or in pellet form.

'Salyrgan' is supplied in amps of 1 c.c. and 2 c.c. in boxes of 5, 25; and in pellets of 0.08g. in tubes of 20, bottles of 250.

'SALYRGAN'

TRADE MARK BRAND OF MERSALYL

SURFACE ANÆSTHESIA WITH 'DECICAIN'

'Decicain' penetrates the mucous membrane deeply and produces rapid and prolonged surface anæsthesia. It is non-irritant, is stable in solution and can be sterilized by boiling.

'Decicain' is ten times more powerful than cocain, and is used in correspondingly weaker dilutions. It is not subject to the Dangerous Drugs Act.

'Decicain is supplied as follows :—

Substance in bottles of 1 g. & 5 g.	*Tablets in tubes of 10 x gr. 1½ (0.1 g.)*
Solution 2% in bottles of 1 oz.	*Ointment 1% in jars of 1 oz.*

Lozenges gr. 1 in bottles of 12.

ANÆSTHESIA FOR
OPHTHALMOLOGY
OTO-RHINO-LARYNGOLOGY
UROLOGY
Literature upon request

'Decicain'

TRADE MARK BRAND OF AMETHOCAINE HYDROCHLORIDE

BAYER PRODUCTS LIMITED, AFRICA HOUSE, KINGSWAY, LONDON, W.C.2

B.D.H. ŒSTROGENS

In the treatment of the Menopausal Syndrome

The use of œstrogens for the control of menopausal symptoms is an established practice. The following B.D.H. œstrogens are available :—

OESTROFORM

Oestroform is the most generally satisfactory preparation for menopausal patients. Treatment is by means of injection; therefore it is completely under the control of the physician.

STILBŒSTROL B.D.H.

Stilbœstrol is still regarded as the most effective of the synthetic œstrogens; it is administered orally and produces nausea only in relatively few patients.

DIENŒSTROL B.D.H.

Dienœstrol is therapeutically similar to stilbœstrol with the advantage that it does not cause any nausea even in susceptible patients.

Stilbœstrol-D.P. (Stilbœstrol Dipropionate B.D.H.) and Hexœstrol B.D.H. also are available.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London

Shor/E/154B

A non-greasy ANALGESIC OINTMENT

PRODUCT OF THE GLAXO LABORATORIES

Relief of pain and discomfort within a few minutes and lasting two hours or more is obtained after the simple, direct application of 'Anethaine' Ointment to the skin or mucous membrane.

'Anethaine' Ointment is non-greasy and is readily removed with water from the skin or clothing. It contains 1.0 per cent. of the fat-soluble base of amethocaine hydrochloride.

For the relief of pain in haemorrhoids and skin diseases generally. Many other uses will suggest themselves to doctors.

ANETHAINE

Ointment

Available in ½ oz. TUBES

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

THE LANCET

LONDON: SATURDAY, OCT. 26, 1946

A Joint Enterprise

MEDICINE and nursing are one art, its aim the care of the patient. If medicine goes on growing, as it must, while nursing is suffering a decline, the achievements of one will be offset by the failures of the other. However sure the diagnosis, neat the operation, or apt the drug the patient dies or suffers if he is badly nursed. Doctors have thus towards the nursing profession a duty of which nowadays they seem hardly aware. In the early days of modern nursing the nurse looked to the doctor for advice and help in developing her specialty, and the results of that collaboration have been an example to the world. Indeed, many of the principles laid down in that atmosphere of confidence and endeavour have stood the test of a century of nursing practice. The founding of the State examination, which placed nursing finally on the footing of a profession, should have strengthened the partnership, doctors and nurses working together as colleagues. In practice there has been something of a break, for which both professions must accept blame. The doctors, probably from inertia, have lost interest in the training of the nurse, and the nurses, from a natural wish to cultivate their own garden, have drawn away from the doctors. It will not do: any disunity—anything short of complete and sympathetic collaboration—means too much risk to the patient.

The neglect of nurses by the doctors has helped to bring nursing into disrepute with possible candidates Miss **MURIEL EDWARDS**, of the Nursing Recruitment Centre, tells us that when she talks in a girls' school on nursing as a profession she often has a long queue of eager questioners to answer at the end; but girl after girl says, "I want to do something in a hospital—not nursing, of course." Asked what, then, she would like to do, the girl says she would like to "do therapy." She does not know what kind of therapist she wants to be: she hardly understands the meaning of the word. All she knows is that a "massage" student is on a very different footing—not only with the doctors but with the general public—from a nurse. To her, nurses are hack workers of whom little scientific ability but much domestic work is expected; and unfortunately the lack of domestic help in hospitals has lately given fresh colour to this old prejudice. Theory in the present nursing curriculum, illogically based on the course of the medical student, is wide in scope and shallow in content, bewildering for the simple girl, yet leaving the girl with brains unsatisfied. Nursing should mean an intimate personal study of the patient; yet bedside nursing, the core of the whole art, is taught in hasty snatches by a sister who is fully occupied in other ways, and by a sister-tutor who is confined to the classroom, and must somehow invest an unresponsive dummy with the appeal of a living patient. Research in nursing is unknown under that name; for though many an ingenious sister contributes impromptu devices to nursing, there is no recognised way of spreading new methods from one hospital to another, and techniques which might have a universal value are stillborn, or live only as long as the local need persists. Again, nurses have no proper control over the equipment they use; these women, who should be as good with their hands and as thrifty with their strength as an old sailor, put up with much pointless exertion because a nurse is not expected to knock in nails, rig pulleys, or put screws in the ceiling when these would make things easier for the patient or for herself. The very aspect of nursing that should appeal most, alike to the intelligent and to the handy girl, has been allowed to sink into a hurried routine in which bedmaking and bedpans, the clock and the sister, have become dreary phantoms, crowding and diminishing the patient.

We believe that the medical profession must take a full and responsible share in restoring nursing to the position in which **FLORENCE NIGHTINGALE** placed it: as an absorbing and stretching career for women *with brains, as well as a satisfying occupation* for women who, though not academic, are physically and emotionally apt for the care of the sick. And we think that an important step in this reablement might be achieved by the founding of an experimental school of nursing in which new departures in the curriculum, as well as in the conditions of the nurse's life, might be given a fair trial. A large training hospital might offer the best opportunities for this venture, and it is possible that funds might be forthcoming from various sources to meet the expenses: certainly the Royal College of Nursing was in communication with the Rockefeller Foundation, before the war, about the establishment of a demonstration school of nursing, though this was probably dedicated to another type of experiment

In this school, we suggest, a medical dean of nursing should be appointed, to work with the matron, the sister-tutor, and the ward sisters in devising a theoretical curriculum oriented to the nurse's needs—for example, with less emphasis on anatomy and physiology and far more on bacteriology and spread of infection. The school might explore the possibilities of a two-year basic training for all entrants—in which bedside nursing was given the honourable place it deserves—and of a senior course, making good use of the mental capacities of the girl who wishes to become a sister. The medical dean of nursing should, in our view, feel himself or herself to be as much responsible for the proper training of the nurses as the dean of the medical school is for his students, and should bring his or her medical colleagues to share more fully in the education of student nurses, especially by taking ward rounds. An example of this kind could not fail to benefit the standing of nursing, besides renewing its standards.

The Bleeding Peptic Ulcer

THE treatment of gastroduodenal bleeding, in common with other hæmorrhagic conditions, has benefited from the war experience of blood-transfusion. This has brought home to the surgeon what large amounts of blood can and often should be given —one of **LOUTIT**'s[1] patients, for instance, received the equivalent of 17 litres in fifteen days. Moreover, administration has become technically easy and, with reasonable care, hæmatologically safe. The number of recognised agglutinins, it is true, is increasing, but their recognition has made it simpler to avoid the dangers of sensitisation. The amount of blood to be transfused must be based on the amount lost, but investigations on blood-volume in shock and hæmorrhage, initiated for gastroduodenal bleeding by Bennett and his collaborators [2] [3] before the late war, revealed the fallacies of clinical estimations of blood-loss. It is now clear that after hæmorrhage the fluid and corpuscular elements of the blood are restored to a certain extent independently of each other, and at completely different rates. The hæmoglobin level is therefore not in itself a reliable guide to the blood-loss; moreover, it is usually impossible to make any allowance for previous anæmia. The level is not immediately altered by a brisk and heavy bleeding, when corpuscles and plasma are lost in the same proportions; it is only later, when the plasma has been replaced and the patient's condition therefore improved, that the hæmoglobin, now lowered, gives some measure of the seriousness of the hæmorrhage. It is true that hæmodilution usually takes place within a very few hours, but it may take up to 24 hours,[2] and the picture is further complicated if the bleeding continues or recurs. The patient's general condition is of course important in estimating severity, and measurement of a large hæmatemesis or melæna will give a rough minimum estimate of the blood lost; the blood-pressure is also a valuable clue, particularly if the normal level is known, and a low pulse-pressure may help in the recognition of the collapsed hypertensive. Nevertheless, accurate criteria of severity are still lacking, and without them it is difficult to confirm and evaluate reports of treatment. What is most needed is an easy and reliable method of determining the blood-volume.

---

[1] Pappworth, M. H., Loutit, J. F. *Lancet*, 1943, ii, 469.

The controversy round treatment usually turns on whether the bleeding from chronic ulceration should be treated surgically or medically, and, if surgically, at what stage. Results are best where coöperation between physician and surgeon is closest.[4] Chronic ulceration accounts for 80% of cases of gastroduodenal hæmorrhage,[5] but where hæmatemesis or melæna is the first manifestation the differential diagnosis must be considered. The patient bleeding from an acute erosion or through cirrhotic congestion or a hæmorrhagic disease, such as purpura, is not a suitable subject for gastric exploration, though Finsterer [6] believes that when doubt exists the risk in operating is outweighed by the danger of leaving a chronic ulcer bleeding. He even advocates gastrectomy for the gastrostaxis of multiple erosions, though this is an extreme view and his quoted fatalities, whether operated on or not, by modern standards received woefully inadequate transfusions. On the other hand, his plea for operation on the known bleeding ulcer within the first 48 hours is well founded. Protracted hæmorrhage is to be anticipated from an ulcer with a big vessel open in its base; and though, if it is not too severe, the blood-loss can continually be made good, the patient's final condition, with very little of his own blood left, is not so satisfactory for operation as at the beginning. The bleeding often stops, thus dispelling the need to operate during the period of hæmorrhage; but sometimes it continues, and by procrastination the surgeon is finally offered a debilitated poor risk. The problem is to decide in which case the bleeding will stop. With a known or strongly suspected ulcer, if the bleeding is not appreciably lessening after 24 hours of adequate treatment it is wise to step up the transfusion until the hæmoglobin is at least 60%, and then take the patient to the theatre with the drip running. Where the diagnosis is in doubt, the best course is probably to replace blood for blood and to make every effort consistent with safety to establish a diagnosis. Some still say that transfusion, by raising the blood-pressure, will start hæmorrhage afresh. This is not supported by experience with drip methods, and indeed the bleeding sometimes stops as soon as the first pint has been absorbed. In any case it may be essential to raise the blood-pressure if life is to be saved.

Diet is important, whether the patient is being treated medically or surgically. A bland semi-solid diet, as recommended by Witts,[7] is perhaps the most generally useful. There is need to go slow with feeding for the first 24 hours; for the patients often feel sick, and vomiting is liable to start the bleeding again. Opinion is not yet settled as to the advisability of emptying the stomach of its blood contents with a tube; the smooth clot covered with mucus makes for nausea and interferes with the sealing of the bleeding vessel. After 72 hours, well-cooked cereals, custards, junket, soft-boiled egg, and puddings may be given in greater quantities. Vitamin C, up to 500 mg a day, should be given. Absolute bed rest may be supplemented by morphine, which should be given in moderate doses since these patients are prone to serious lung complications. Morphine should be replaced by barbiturates after 24 hours. In the convalescing patient the hæmoglobin and blood-pressure should be frequently estimated; the hæmoglobin should not be allowed to remain low, for a further hæmorrhage would then be disastrous. Packed corpuscles are at this stage superior to whole blood, and should be given in repeated small infusions.

When operation is decided on, its nature will obviously vary with the patient and the surgeon. To open the stomach (or duodenum) and insert mattress sutures over the ulcer is the simplest, and, with bad risks the best, procedure; and it may be necessary to combine this with ligature of the bleeding vessel. With the induration and distortion that is often present it may not be easy to establish which vessel needs tying or to expose it. Here detailed knowledge of anatomy is essential, and it should include an understanding of the anomalies of vessels at the pyloric end of the stomach which Gordon-Taylor [8] describes. He emphasises that operating for ulcer hæmorrhage is not synonymous with gastrectomy. The object is to stop the bleeding and prevent its recurrence; this may in fact be sometimes most readily attained by gastrectomy, and it is reasonable to consider this surgical cure if it does not add excessively to the risk. Some of the figures for gastrectomy show how remarkably results have improved with adequate transfusion—but it must not be forgotten that the results of medical treatment have also improved.

---

[2] Bennett, T. I., Dow, J., Landor, F. P. L., Wright, S. *Ibid*, 1938, ii, 651.
[3] Bennett, T. I., Dow, J., Wright, S. *Ibid*, 1942, ii, 551.
[4] Gordon-Taylor, G. *Brit. J. Surg.* 1946, 33, 336.
[5] Eads, J. T. *J. Amer. med. Ass.* 1946, 131, 891.
[6] Finsterer, H. *Surg. Gynec. Obstet.* 1939, 69, 291.
[7] Witts, L. J. *Brit. med. J.* 1937, i, 847.
[8] Gordon-Taylor, G. *Brit. J. Surg.* 1937, 25, 403.

If the physician is to do his best for the patient he must learn to differentiate early between the case in which there is but a slow intermittent ooze and the serious hæmorrhage from the open large vessel, unlikely to yield to simple medical measures. The patients who die are usually those over the middle forties. This is not because of any associated arteriosclerotic brittleness of the vessels, but because these patients have almost certainly had ulcers of long standing; the bleeding vessel is encased in a fibrotic mass and is unable to retract and contract. Thrombosis in the vessel is the only hope of stemming the leak. The case with a long history, and particularly with previous bleeding, is the one where the need for surgery requires strongest consideration. Before the late war it was generally held that to operate after 48 hours' bleeding was nearly always disastrous, especially as the bowel suture lines seemed to make no attempt at adequate healing. With the adoption of massive rapid transfusions this is no longer true, and results in this country show that such "late" surgery is now being successfully undertaken. Nevertheless, cases requiring surgical intervention are relatively few, and medical management must still form the first line of treatment.

Infected Food

THE increasing incidence of food-poisoning since the start of the late war may be due, in part, to the growing number of residential institutions and communal feeding centres. Unfortunately, investigation of the toxic form is hampered by the lack of a susceptible animal. Moreover, no outbreak can be fully investigated unless it is notified at its very beginning; this rarely happens, and anyone working on the subject is familiar with the disappointment of arriving to find that all the suspected food has been thrown away or that only some empty tins remain, stinking and fly-blown after days in a dustbin. It is from the comparatively few outbreaks which have been fully investigated that our understanding of the condition is derived.

Ducks' eggs have been repeatedly incriminated as a source of salmonella infection. Lately *Salmonella typhimurium* (*aertrycke*) of identical phage type was isolated from a patient who had eaten an egg and from the duck itself[1]; and the Ministry of Health's war report[2] records altogether nine outbreaks from this source. MALLAM and ALHADEFF,[3] in recording another case, urged that ducks' eggs for eating should come from healthy birds, be gathered daily, and be laid in dry and uncontaminated surroundings. The hen's egg, in the "shell-egg" form, appears to be a rare source of infection; the first and only certain example was reported last year by WATT,[4] who isolated *S. montevideo* from eggs of the batch used for the mayonnaise from which an outbreak originated. However, *S. pullorum*, the cause of bacillary white diarrhœa, remains the most important source of fatal septicæmia in young poultry, and other salmonella organisms pathogenic to man are now causing serious epidemics in poultry. It was therefore natural that dried eggs, which began to arrive here in 1941 and were first distributed on a large scale in 1942, should be investigated for this group of organisms. Since 1942 there have, in fact, been outbreaks with many new types: to *S. typhimurium*, *enteritidis*, *thompson*, and *newport* have been added *S. oranienburg*, *montevideo*, *sundsvall*, *meleagridis*, and others hitherto unknown in this country. During 1942 vast numbers of American troops were arriving here; but, though they mixed with the civilian population, they took no part in the preparation of its food, and are thus unlikely to have had any notable effect. Investigation, in fact, confirmed that dried eggs were the source, for in them the new types, including *S. oranienburg* and *S. montevideo*, were identified. During the war altogether ten outbreaks of salmonella infection in man were attributed to this source,[5] although the instructions for reconstitution had been amended to direct that the fluid mixture should be used immediately, so as to minimise the time during which the organisms could multiply.

Cooked-meat products have always been regarded as an important cause of food-poisoning, especially because the salmonella group is pathogenic to both bovines and pigs; *S. dublin* and *S. enteritidis*, for example, are a cause of diarrhœa in cows and may give rise to symptoms in humans who drink infected milk. But cooked meat, particularly in brawn and meat pies, is probably most commonly infected from extraneous sources, such as food-handlers, rodents, or flies. The food is commonly harmless when eaten soon after being prepared, but, by the multiplication of bacteria in such an admirable medium, may cause serious illness when consumed a few hours later. Last year an extensive and explosive outbreak in three eastern States of the U.S.A. was traced[6] to cheese, which was found to contain *S. typhimurium* although it had been stored at 43°–48° F for 302 days after manufacture. Occasionally, outbreaks of food-poisoning have been attributed to members of the dysentery group; one such outbreak, probably due to infected ice-cream, occurred at Aberystwyth four years ago.[5] Whatever the causative organism, the clinical syndrome is usually much the same, with headache, upper abdominal cramps, nausea, diarrhœa, and sometimes vomiting and fever; recovery is complete within a week. With severe infection, particularly in the young and old, the symptoms are more varied, and meningitis, septicæmia, or an acute abdominal condition may be simulated.

The toxic form of food-poisoning is now well known in Britain. Of 296 outbreaks, the toxic products of bacterial growth were blamed in 115, injurious chemicals in 6, and salmonella organisms in 38. The clinical picture can hardly be mistaken: after a short incubation period, usually of about 4 hours, there is an acute onset, with vomiting, abdominal pain, and usually diarrhœa and prostration, which are followed

---

1. Gordon, R. F., Buxton, A. *Mon. Bull. Min. Hlth & E.P.H.L.S.* 1945, 4, 46. Gillespie, E. H. *Ibid*, 1946, 5, 157.
2. On the State of the Public Health during Six Years of War, 1939–45. London, 1946.
3. Mallam, P. C., Alhadeff, R. *Lancet*, 1946, i, 887.
4. Watt, J. *Publ. Hlth Rep., Wash.* 1945, 60, 835.
5. *Mon. Bull. Min. Hlth & E.P.H.L.S.* December, 1942, p. 4.
6. Tucker, C. B., Cameron, G. M., Henderson, M. P., Beyer, M. R. *J. Amer. med. Ass.* 1946, 131, 1119.

by rapid recovery. The commonest organism is the coagulase-positive *Staphylococcus aureus*, whose toxin is relatively heat-stable and may resist cooking; it may find its way into the food from handlers with minor septic hand infections or with heavy nasal infection. Outbreaks have been traced to other organisms, including non-hæmolytic streptococci, the proteus group, and various anaerobic bacilli, but no cases of *Clostridium botulinum* infection have been recorded in this country since 1936.

The existence of human carriers of the food-poisoning organisms has often been denied; but BURT[7] has described a patient who carried *S. typhimurium* for 4 years; and TOMLINSON and LINSELL[8] found that convalescents carried *S. thompson* for up to 6 weeks. Such people would be dangerous to others if they were in charge of food-preparation. Much can be done to prevent the disease by the education of kitchen staffs in personal hygiene and by suitable arrangements for the washing of hands and utensils. During the war cook-house personnel of the Army and R.A.F. were investigated for organisms of the salmonella group. If this simple investigation were extended to food-handlers in all the larger feeding centres, carriers could be identified and diverted to some less dangerous occupation.

Annotations

CRISIS AND CONSEQUENCES

THE crisis over the capitation fee, which endangered the chance of good relations between insurance practitioners and the Ministry of Health, has now been resolved. Up and down the country a great many doctors stood ready to resign from the National Health Insurance service at the call of the Insurance Acts Committee. The new approach came a fortnight ago from the Minister, who recognised no doubt how wide was the feeling of injustice created by his refusal of separate discussions on the application of the Spens report to the current capitation fee. As a result a formula has been reached which the I.A.C. is recommending the Panel Conference to accept. "The Minister," we are now told, "is willing fully to apply the Spens report to the current capitation fee with effect from Jan. 1, 1946, the increase of 2s. being regarded as a payment on account. To this end, he invites the I.A.C. to enter into discussions on the report forthwith, with special reference to the current capitation fee. The discussions will be conducted expeditiously."

No doubt the Panel Conference (which meets as we go to press) will find this proposal acceptable. It could hardly do otherwise, for the Minister has accepted without qualification the very demand made to him by the I.A.C.—failing acceptance of which, resignations were to be invited. That an agreement is within sight is good, and better still is the promise that discussions will be started at once and conducted expeditiously. It is to be hoped that an early and generous settlement can now be negotiated, that the long frustration which has marred relations with the Ministry will be removed, and that the way will thus be cleared for dispassionate consideration of the problems which will crowd upon us with the enactment of the National Health Service Bill.

Nevertheless the controversy now ending is bound to have repercussions when the time comes for asking members of the profession individually whether they favour discussion on the regulations to be made under the Act. Lest too easy conclusions should then be drawn, it would be well to record now, and to remember later, that the doctors have gained their point this time chiefly because they had a case, a good case, and one on which they felt genuinely united. It may be, too, that the Minister has been accommodating because the very reasonableness of the practitioners' case, and of its presentation by the I.A.C., placed him in a vulnerable position. In the larger issues shortly to be met the circumstances will be different. Lord Listowel, speaking for the Government in the House of Lords, expressly said: "We all desire the coöperation of the medical profession in working out the machinery for the new health service." Mr. Bevan, at the annual dinner of the British Orthopædic Association, reported on another page, remarked that his relations with the British Medical Association grow more friendly week by week, and that before very long, he is sure, they will reach a cordial understanding and obtain coöperation in carrying out the great work of the health service. We hope he is not being over-optimistic; and we believe the profession will accept his sincere desire to have full coöperation from its representatives in drafting the regulations which will shape the new service. It would be a mistake, however, to suppose that, with his health policy newly endorsed by both Houses of Parliament, he will be either willing or able to buy such cooperation by any deviation from the policy now expressed in the Bill. The profession will have much to gain by negotiating liberalising regulations under the Act when time and opportunity offer; but it will achieve nothing positive if its contribution takes the form of general condemnation and boycott of the new Act.

TRAINING IN CHILD WELFARE

THE education of girls has been modelled so closely on the education of boys that most girls leaving school at 16 or 18 have little experience of cooking, domestic management, or the care of children, and moreover have acquired an impression that time spent on such things is wasted. (Those who leave school at 14 may have a better chance of learning these basic arts, for they often come of larger and poorer families where it is natural for everyone to lend a hand.) Yet the care of children in the home, as we had occasion to say not long ago,[1] is at least as important as the care of the machine in a factory; and the output of the home takes precedence of the output of industry.

A group committee of the National Council for Maternity and Child Welfare have published a report[2] on courses of training in the care of healthy children of all ages, not only for students taking higher posts in children's homes and nurseries but also for teachers in the subject. They contemplate the development of a new profession of child welfare, having equal status with nursing and teaching. At present the only recognised training specifically for child care is the elementary course for the National Nursery Certificate, planned for girls between 14 and 16, and only dealing with children of nursery age. Those who wish to take responsible posts in nurseries or nursery schools must train, after the age of 18, as hospital nurses or nursery-school teachers; but a nurse's training, with its bias towards the care of sickness, is not the ideal background for holders of these posts, while nursery-school teachers concentrate mainly on children between the ages of 2 and 5 and learn nothing of the care of children under 2. The Curtis Committee on the care of children recently suggested[3] that there should be training for the house mothers and house fathers who take charge of residential foster homes, but this has yet to be started. In Scotland a new course for nursery workers is about to be instituted.[4]

---

[7] Burt, H. *J. Path. Bact.* 1944, 56, 200.

[8] Tomlinson, A. J. H., Linsell, W. D. *Mon. Bull. Min. Hlth & E.P.H.L.S.* 1946, 5, 117.

[1] *Lancet*, Sept. 28, p. 458.

[2] Training in Child Welfare. Second Report of the Group Committee of the National Council for Maternity and Child Welfare. Published by the National Society of Children's Nurseries, 117, *Piccadilly, London*, W.1. Pp. 17. 1s.

[3] See *Lancet*, 1946, i, 618.

Child welfare must be taught by good teachers; and these, the committee suggest, should be trained in child-welfare colleges—or departments of existing colleges—associated with a university, and especially with university departments of child health and education. They would also be associated with centres offering allied courses, such as teachers' and domestic-science colleges. Those intending to become teachers would take the full course, lasting three years, and those wishing to take posts in nurseries or children's homes would take a two years' course. They would study the child and his needs in relation to the family, including his physical, mental, and emotional development from infancy to adolescence. The course would cover nutrition, from breast-feeding to a full mixed diet, and clothing, from the layette to the dress of well-grown young people; there would be training in home management, lectures on existing social services in this country and others, practical work in nurseries, play centres, youth organisations, and residential homes, and instruction in he teaching of child welfare. A six months' course would also be provided for those who, having qualified n an allied profession—as teachers, nurses, or health visitors—wished to become child-welfare workers or teachers. The outlines of the syllabus are sketched in an appendix.

The second part of the report sets out plans for better instruction in child care in secondary schools and county colleges. A study of 77 infant deaths at Barnsley[5] shows that among 31 deaths classed as preventable, 19 were attributed to such interrelated factors as poor social and economic conditions, poor mothercraft, poor coöperation by the mother, and poor team-work by the hospitals or public-health staff. The committee believe that a gain in children's health, and ultimately that of the whole community, would be achieved if girls were given more instruction in child care—a view which we warmly share.

RHEUMATISM RESEARCH CENTRES

In 1945 the Ministry of Health's medical advisory committee recommended that a number of diagnostic and research centres should be established for the study of chronic rheumatism and for the improvement of diagnosis and treatment. The special centres, it was felt, should be located in university medical schools and teaching hospitals, and the Nuffield Foundation has now made a grant of £100,000, spread over ten years, towards the establishment of such a centre at the University of Manchester. There is to be, first, a diagnostic and research centre at the teaching hospital, the Manchester Royal Infirmary, to deal with short-stay inpatients and outpatients who will be referred from peripheral clinics in the region. For long-stay inpatients there will also be a clinic at a nearby base hospital, provided by the Manchester public-health committee, and a second base hospital in the country, the Devonshire Royal Hospital at Buxton. At these base hospitals lengthy investigations will be carried out and problems of reablement and resettlement will be studied. This scheme will ensure ready access to a very large number of cases, especially those in an early stage. At the centre the work will cover two main fields—the clinical, sociological, and industrial aspects of the disease, and the fundamental study of the rheumatic process. The clinical work will be directed by a physician, who will have the help of the departments of orthopædics and physiotherapy of the Manchester Royal Infirmary as well as of the university dental school. The social aspects of rheumatism, and its industrial implications, will be studied in coöperation with the university department of industrial health. Bone and joint pathology will be investigated under the direction of a pathologist expert in the subject. It is hoped that the scheme will lead to diffusion of the knowledge gained at the university centre.

Readers will recall that the British Legion recently set up a 50-bed rheumatism research and treatment centre at Fairfield Hospital, near Letchworth.[1] This is closely linked with the parent hospital in London, the Royal Free.

SULPHONAMIDE GRANULOPENIA IN CHILDREN

The effects of sulphonamide drugs on the blood-forming tissues are now well known—hæmolytic anæmias, agranulocytosis, and sometimes aplastic anæmia. The manifestations may be of an allergic type, appearing suddenly during a first or subsequent course of treatment; or they may be toxic in character, appearing gradually during the treatment. Menten and her associates[1] have been watching the effects in children and have noted that there have been far more cases of aplastic anæmia and neutropenia—short of agranulocytosis—in a children's hospital since sulphonamides became commonly used, particularly for infections of the upper respiratory tract and other infections, such as cellulitis. Aplastic anæmia is uncommon in childhood; only 1 case was seen in this hospital between 1928 and 1942 but there were 6 between 1942 and July, 1945. Of these 6 cases, 5 had received sulphonamide drugs shortly before the diagnosis was made, and the dose was often on the large side—over 30 g. in children of 6–13 years. All were fatal. Granulopenia shows a similar increase,[2] from 2·9% of admissions to the hospital in 1939 to 12% in 1944, the peak year; the 12% all had at some time less than 3000 granulocytes per c.mm., and about half of them had less than 2000 per c.mm. In 1945, when penicillin was beginning to replace sulphonamides, the incidence fell to 7·6%, but analysis of the cases showed that in 1944 and 1945 about 20% of all children receiving sulphonamides developed a definite granulopenia at some stage.

In animals with experimental granulopenia induced by sulphonamides it had been noted that folic acid would bring about, or at least accelerate, recovery of the blood-forming tissues. Menten and Graff[3] therefore treated some of their granulopenic children with folic acid. At first results were negative; because of favourable published reports pyridoxine was then added, 150 mg. being given by mouth daily. The effects were, on the whole, encouraging; 13 out of 22 children treated showed a rise of granulocytes towards normal levels; the rise was not rapid, most patients requiring treatment for a week to a fortnight. In some the blood-count relapsed when the treatment was stopped, and in some a further dose of sulphonamide produced a relapse. The 9 patients who did not respond—or only responded poorly—were all in hospital for upper respiratory infections; 3 had had treatment with folic acid alone for two or three days only (too short a period), 2 were taken home just when observations might have proved useful, and 4 showed no definite effect. To give folic acid and pyridoxine separately is expensive, and an attempt was made to get results by adding yeast to the diet; in practice the attempt failed because the yeast, either live or in powder, produced too much intestinal gas and abdominal distension.

Unfortunately no figures are available to show the speed of recovery of children whose sulphonamide drug was stopped—as it was in all cases—and who were given no other treatment; experience in adults suggests by rapid recovery. The commonest organism is the coagulase-positive *Staphylococcus aureus*, whose toxin is relatively heat-stable and may resist cooking; it may find its way into the food from handlers with minor septic hand infections or with heavy nasal infection. Outbreaks have been traced to other organisms, including non-hæmolytic streptococci, the proteus group, and various anaerobic bacilli, but no cases of *Clostridium botulinum* infection have been recorded in this country since 1936.

---

[4] *Ibid*, Oct. 19, p. 585.

[5] Lewis, J. T., Blackwood, M. W. *Mon. Bull. Min. Hlth & E.P.H.L.S.* September, 1946, p. 190.

[1] See *Lancet*, 1946, i, 870 (Lord Horder), and 1946, i, 947.

[1] Denny, H. M., Menten, M. L. *Amer. J. med. Sci.* 1946, 211, 659.

[2] Menten, M. L., Graff, E. *Ibid*, p. 666.

[3] *Ibid*, p. 672.

The existence of human carriers of the food-poisoning organisms has often been denied; but Burt[7] has described a patient who carried *S. typhimurium* for 4 years; and Tomlinson and Linsell[8] found that convalescents carried *S. thompson* for up to 6 weeks. Such people would be dangerous to others if they were in charge of food-preparation. Much can be done to prevent the disease by the education of kitchen staffs in personal hygiene and by suitable arrangements for the washing of hands and utensils. During the war cook-house personnel of the Army and R.A.F. were investigated for organisms of the salmonella group. If this simple investigation were extended to food-handlers in all the larger feeding centres, carriers could be identified and diverted to some less dangerous occupation.

Annotations

CRISIS AND CONSEQUENCES

The crisis over the capitation fee, which endangered the chance of good relations between insurance practitioners and the Ministry of Health, has now been resolved. Up and down the country a great many doctors stood ready to resign from the National Health Insurance service at the call of the Insurance Acts Committee. The new approach came a fortnight ago from the Minister, who recognised no doubt how wide was the feeling of injustice created by his refusal of separate discussions on the application of the Spens report to the current capitation fee. As a result a formula has been reached which the I.A.C. is recommending the Panel Conference to accept. "The Minister," we are now told, "is willing fully to apply the Spens report to the current capitation fee with effect from Jan. 1, 1946, the increase of 2s. being regarded as a payment on account. To this end, he invites the I.A.C. to enter into discussions on the report forthwith, with special reference to the current capitation fee. The discussions will be conducted expeditiously."

No doubt the Panel Conference (which meets as we go to press) will find this proposal acceptable. It could hardly do otherwise, for the Minister has accepted without qualification the very demand made to him by the I.A.C.—failing acceptance of which, resignations were to be invited. That an agreement is within sight is good, and better still is the promise that discussions will be started at once and conducted expeditiously. It is to be hoped that an early and generous settlement can now be negotiated, that the long frustration which has marred relations with the Ministry will be removed, and that the way will thus be cleared for dispassionate consideration of the problems which will crowd upon us with the enactment of the National Health Service Bill.

Nevertheless the controversy now ending is bound to have repercussions when the time comes for asking members of the profession individually whether they favour discussion on the regulations to be made under the Act. Lest too easy conclusions should then be drawn, it would be well to record now, and to remember later, that the doctors have gained their point this time chiefly because they had a case, a good case, and one on which they felt genuinely united. It may be, too, that the Minister has been accommodating because the very reasonableness of the practitioners' case, and of its presentation by the I.A.C., placed him in a vulnerable position. In the larger issues shortly to be met the circumstances will be different. Lord Listowel, speaking for the Government in the House of Lords, expressly said: "We all desire the coöperation of the medical profession in working out the machinery for the new health service." Mr. Bevan, at the annual dinner of the British Orthopædic Association, reported on another page, remarked that his relations with the British Medical Association grow more friendly week by week, and that before very long, he is sure, they will reach a cordial understanding and obtain coöperation in carrying out the great work of the health service. We hope he is not being over-optimistic; and we believe the profession will accept his sincere desire to have full coöperation from its representatives in drafting the regulations which will shape the new service. It would be a mistake, however, to suppose that, with his health policy newly endorsed by both Houses of Parliament, he will be either willing or able to buy such coöperation by any deviation from the policy now expressed in the Bill. The profession will have much to gain by negotiating liberalising regulations under the Act when time and opportunity offer; but it will achieve nothing positive if its contribution takes the form of general condemnation and boycott of the new Act.

TRAINING IN CHILD WELFARE

The education of girls has been modelled so closely on the education of boys that most girls leaving school at 16 or 18 have little experience of cooking, domestic management, or the care of children, and moreover have acquired an impression that time spent on such things is wasted. (Those who leave school at 14 may have a better chance of learning these basic arts, for they often come of larger and poorer families where it is natural for everyone to lend a hand.) Yet the care of children in the home, as we had occasion to say not long ago,[1] is at least as important as the care of the machine in a factory; and the output of the home takes precedence of the output of industry.

A group committee of the National Council for Maternity and Child Welfare have published a report[2] on courses of training in the care of healthy children of all ages, not only for students taking higher posts in children's homes and nurseries but also for teachers in the subject. They contemplate the development of a new profession of child welfare, having equal status with nursing and teaching. At present the only recognised training specifically for child care is the elementary course for the National Nursery Certificate, planned for girls between 14 and 16, and only dealing with children of nursery age. Those who wish to take responsible posts in nurseries or nursery schools must train, after the age of 18, as hospital nurses or nursery-school teachers; but a nurse's training, with its bias towards the care of sickness, is not the ideal background for holders of these posts, while nursery-school teachers concentrate mainly on children between the ages of 2 and 5 and learn nothing of the care of children under 2. The Curtis Committee on the care of children recently suggested[3] that there should be training for the house mothers and house fathers who take charge of residential at St. Joseph's Hospital, Winnipeg. The course, lasting a year, includes 3 months of classroom work and 9 months' experience in hospital, of which 1½ months must be spent in a tuberculosis sanatorium.

---

[7] Burt, H. *J. Path. Bact.* 1944, 56, 209.

[8] Tomlinson, A. J. H., Linsell, W. D. *Mon. Bull. Min. Hlth & E.P.H.L.S.* 1946, 5, 117.

[1] *Lancet*, Sept. 28, p. 458.

[2] Training in Child Welfare. Second Report of the Group Committee of the National Council for Maternity and Child Welfare. Published by the National Society of Children's Nurseries, 117, Piccadilly, London, W.1. Pp. 17. 1s.

[3] See *Lancet*, 1946, i, 618.

A course in Ontario, lasting 9 months, is divided into three equal parts, devoted to the classroom work, supervised practice in the hospital and community, and practical work in hospital on a small salary.

The *Canadian Hospital* for September, after surveying what has been done, raises a number of questions about possible developments. As regards legislation it is thought better to have one controlling Act dealing with all the nursing services than to follow the example of Manitoba. The risk of competition with registered nurses is not considered serious; even if there were a depression, there would be new openings for registered nurses. A suitable name has been much discussed, and "practical nurse" is definitely first favourite. The journal holds that this new grade is likely to be permanent.

BETWEEN TWO CENTURIES

THE first medical officer of health, Dr. W. H. Duncan, Liverpool, was appointed on Jan. 1, 1847; and is approaching centenary was the theme of Sir llen Daley's presidential address to the Society of ledical Officers of Health on Oct. 17.[1] He found uch to be thankful for. Contrasting the national tatistics of 1847 and 1945, he showed that, while the irth-rate declined from 31·5 per 1000 to 16·1, the death-ate fell from 24·7 to 11·4, infant mortality from 164 er 1000 live births to 47, and maternal mortality from ·52 to 1·84. Against the acute infectious diseases, to hich the public-health service has paid special attention, onsiderable success has been attained; but this does ot apply to all of them, and the increase of the tuberulosis death-rate early in the war showed the precariousess of our attack. Nor does Sir Allen think that the ncreases in the deaths from respiratory and circulatory iseases and from cancer can be lightly dismissed on the round that we must all die of something:

> "Many of these deaths are preventable in that they are curable if treated early. Very many, particularly the respiratory disorders, occur in young children. Coronary thrombosis carries off many of our most able citizens in middle age. Death from rheumatic carditis can be largely reduced, if not prevented. Cancer is a serious cause of death well before the age of 65. It is gratifying that increasing attention is now being given to gerontology, or the study of old age, and its causes, but we must recall Professor Crew's words: the real problem is not 'how to give years to life but life to years.'"

Unfortunately, continued the president, the M.O.H. still does not possess the tools needed for his job: he ought to have complete morbidity figures for his own area, and, if it is large, for the various sections of it. In the future every doctor must be imbued with the principles of preventive medicine, asking himself, for each patient, "Why is he ill? Could this illness have been prevented? If so, how?" Before very long there will no longer be the two camps of curative and preventive medicine, for all who look after patients will combine curative and preventive work. Nevertheless there will always be room for the specialist in preventive medicine, and his rôle will be increasingly important, covering communal hygiene, industrial hygiene, epidemiology, the care of the convalescent and the disabled, the teaching of health, and administration. At the health centre "we will have administrative duties in which we are all well trained. The duty of an administrator is to ensure that the proper tools, auxiliary staff, and accommodation are provided for the executives to do the job." Freedom from the pressing cares of managing a hospital service will give the M.O.H. more time to develop his functions as a specialist in preventive medicine.

At the beginning of their second century, Sir Allen Daley called on his hearers to carry on the torch of preventive medicine, which should illuminate with increasing strength the whole medical field.

ANÆSTHESIA IN RETROSPECT

THOUGH a hundred years have passed since Robert Liston operated under ether, we should not, in celebrating this memorable centenary, ignore many earlier successes. Prof. Charles Singer, who took the chair at the Royal Society of Medicine's meeting on Oct. 16, had the agreeable task, fulfilled with elegance, of reminding those present of Adam, of the anæsthetic sponge, of mandragora, henbane, and prickly lettuce, of mesmerism, of Boccaccio's *Decameron* (suitably expurgated), and of the poet Southey's view that the atmosphere of the very highest heaven is composed of laughing gas. Dr. Barbara Duncum, who had the more mundane duty of outlining the development of inhalation anæsthesia in the second half of the nineteenth century, contributed solid facts to an informative afternoon. The modern development of anæsthesia was confided to Dr. Joseph Blomfield, who told of the year 1900 when we had chloroform, ether, and nitrous oxide and nothing else; of ethyl chloride, useful for short operations on children; of open ether ("some of you may even have given it"); of spinal anæsthesia; of Knapp's venous congestion, rectal ether, oral chloroform given with paraffin and followed by half a glass of port; of premedication, endotracheal ether, intravenous anæsthetics, and many another technical advance or experiment.

At the end of the meeting Dr. E. Ashworth Underwood startled the company with an original piece of research, bringing strong evidence to show that Liston's famous amputation was not the first operation in Europe to be done on a patient under general anæsthesia, but that two surgeons in his native town of Dumfries, at the instigation of a fellow Scot, Dr. James Fraser, had quietly performed an amputation on an etherised patient about a month or six weeks before Liston got round to his. Fraser knew Morton in America, and when he came home on a visit he seems to have persuaded Dr. McLaughlin and Dr. Scott, at the Dumfries Infirmary, to try sulphuric ether on a patient with a fractured limb—probably some time in November, 1846. Liston, of course, did his operation on Dec. 21, 1846.

This painstaking piece of historical research, which seems likely to carry the priority honours from England to Scotland, was unfortunately delivered at the end of the session to a closely packed hall whose atmosphere was itself somewhat anæsthetic. More justice was done to it, however, at the Wellcome Historical Medical Museum, where an exhibition on the history of anæsthesia was opened by Lord Moran later in the afternoon. Here some of the relevant documents were well displayed, together with early works on analgesics, and many types of inhaler used in early experiments. The case for the patient, too, has been generously included in the form of a song, to be sung to an air from "The Beggar's Opera," which appeared in the *Illustrated London News* of Jan. 30, 1847:

How happy could I be with Æther
  Were mesmeric charmers away,
But while they perplex me together
  The Devil a word can I say.
Sing Robinson, Thomson, and Cooper,
  Fol Lol de Rol, Lol de Rol, Lay
There's nothing like Æther and Stupor
  For making a hospital gay.

WE have to record that Dr. T. WARDROP GRIFFITH, emeritus professor of medicine in the University of Leeds, died on Oct. 21. He was in his 86th year.

---

[1] To appear in full in the November issue of *Public Health*.

that the recovery would not be much less rapid than in the patients treated with folic acid and pyridoxine. Neither of these substances is easy to obtain in this country, but the combination is clearly worth a trial in persistent cases of granulopenia. Menten's observations remind us that toxic depression of hæmopoiesis is a factor to be reckoned with when using sulphonamides in children's diseases.

THE DEMOBILISED SPECIALIST

THE last few months before demobilisation is for many medical officers an anxious period, filled with questioning about their civilian prospects. Of those who want to be specialists, some already have the qualifications and experience expected of applicants for senior civilian appointments; but even for these the way has not been easy. Registrarships, supernumerary or otherwise, have offered a temporary refuge; but the number of posts offering a livelihood to fully qualified specialists has been far below that of the suitable candidates. At any time there would have been some delay before all these men were absorbed; but the extent and the duration of unemployment and uncertainty have been magnified because most young specialists now expect to receive a substantial proportion of their income from a hospital, while the hospitals are disinclined at present to enter into new commitments.

Some months ago the Minister of Health showed himself alive to these circumstances by encouraging hospitals to create new senior paid appointments, and he promised to come to their rescue if they should get into financial difficulties. Perhaps judging its terms to be too vague, the hospitals showed themselves somewhat unresponsive to this appeal. Now Mr. Bevan has intervened again with an unequivocal offer: local authorities and the larger voluntary hospitals are invited to increase their senior establishments by creating additional whole-time posts, at salaries of about £1000 a year, the cost of which is to be charged to the Treasury. The Minister also proposes to ease the lot of the junior specialist by increasing the number and the duration of supernumerary registrar appointments, and he has made the important concession that these appointments shall be open also to those who were specialists in the Forces, though they had not previously shown an intention to specialise. The continued training of graded specialists is still under discussion; the usual practice at the moment is for them to spend six months in a grade I appointment before being advanced to registrar status. These fresh concessions, the need for which we stated last June,[1] will prevent many from drifting, through economic necessity, into other fields, where they would be lost to specialist practice; and it has doubtless not escaped the Minister that those who benefit under this scheme will form a useful nucleus when the new service, with its unprecedented demand for specialists, begins to operate.

What of the future general practitioner? The only word the Minister spares for him is that a grade I appointment will be provided as soon as possible after demobilisation. Nevertheless, the general practitioner, no less than the specialist, has his problems, some of which we have already indicated.[2] They include the difficulty, if he takes a grade I appointment, of managing his affairs on the salary of a senior houseman; the scarcity of assistantships; the reluctance of principals to accept new partners or to sell their practices; and the heavy responsibility of investing capital in a house or practice, if one can be found. Possibly doctors with panel practices may be more ready to employ assistants now that the capitation fee is likely to be further raised; but even given an assistant's salary the man with family responsibilities may still wonder how to make ends meet.

ENCEPHALOMENINGITIS OF VIRUS ORIGIN

SOONER or later most practising doctors come across the healthy young patient who, after a few days' headache and malaise, falls acutely ill with fever, headache, drowsiness or even stupor, and meningism, with or without increased tendon reflexes and an extensor plantar response. The first sigh of relief is expressed when the chloride content of the cerebrospinal fluid is found to be normal; and the next when the fluid, which may be clear or only faintly opalescent, is proved to contain no organisms. The cells—mostly lymphocytes—number up to 200 per c.mm., and there is a slight increase in protein. At the end of a week or so the temperature falls, the patient embarks on the road to convalescence, and the doctor's bewilderment is forgotten in his relief that the condition, whatever it may have been, has left no mark.

Even the elect may find it impossible to explain such an illness. Acute encephalitis lethargica, poliomyelitis, and acute lymphocytic choriomeningitis must all be borne in mind during the early days, but the truth seems to be that this clinical picture can be produced by a large variety of viruses, some of which usually, and some only rarely, attack the nervous system. In addition to those mentioned these include lymphogranuloma venereum, psittacosis, infectious mononucleosis, and mumps. St. Louis encephalitis and the two varieties of equine encephalitis have so far only been observed in the United States. Doubtless other hitherto unidentified viruses may also be the cause. Instances of this syndrome are constantly occurring sporadically, and are seldom diagnosed until recovery or complications set in.

Since June a good many examples of an illness of this kind have been seen in the London area. The characteristics of this particular outbreak are its scattered distribution and the rarity with which two members of the same family are affected; observation has been complicated by a concurrent outbreak of poliomyelitis. In some patients cranial nerve palsies have been recorded, but fortunately recovery from these as from the other manifestations has almost always been complete. Little new light has been thrown on the ætiology, though there is renewed suspicion that the infection may be transmitted through animals, including such domesticated creatures as the cat. Many of these neurotropic viruses have been shown to infect animals or birds, from which they may be transmitted to man by insect vectors such as mosquitoes or ticks.

PRACTICAL NURSES IN CANADA

IN 1945 the Province of Manitoba passed an Act to authorise "the training, examination, licensing, and regulation of practical nurses." The Act defined a practical nurse to be "a person who being neither a registered nurse nor a person in training to be a registered nurse at a school of nursing recognised by the Minister undertakes nursing for remuneration." With the approval of a qualified medical practitioner, a licensed practical nurse may perform nursing duties "(a) during the convalescence of a patient, (b) after childbirth where there are no complications necessitating the services of a registered nurse, (c) in mild types of illness, (d) in chronic illness of long duration not requiring the services of a registered nurse, or (e) in any other cases prescribed in the regulations."

The council entrusted with the administration of the Act contains representatives of the Manitoba Association of Registered Nurses and anticipates the formation of an association of practical nurses who will also be represented on it. The aid of the various organisations of registered nurses throughout the Dominion has been enlisted, and instruction of practical nurses is being carried out under their direction. The first class for practical nurses was opened at the beginning of the year at St. Joseph's Hospital, Winnipeg. The course, lasting a year, includes 3 months of classroom work and 9 months' experience in hospital, of which $1^1/_2$ months must be spent in a tuberculosis sanatorium.

---

[1] *Lancet*, 1946, i, 855.

[2] *Ibid*, p. 968.

A course in Ontario, lasting 9 months, is divided into three equal parts, devoted to the classroom work, supervised practice in the hospital and community, and practical work in hospital on a small salary.

The *Canadian Hospital* for September, after surveying what has been done, raises a number of questions about possible developments. As regards legislation it is thought better to have one controlling Act dealing with all the nursing services than to follow the example of Manitoba. The risk of competition with registered nurses is not considered serious; even if there were a depression, there would be new openings for registered nurses. A suitable name has been much discussed, and "practical nurse" is definitely first favourite. The journal holds that this new grade is likely to be permanent.

BETWEEN TWO CENTURIES

THE first medical officer of health, Dr. W. H. Duncan, of Liverpool, was appointed on Jan. 1, 1847; and this approaching centenary was the theme of Sir Allen Daley's presidential address to the Society of Medical Officers of Health on Oct. 17.[1] He found much to be thankful for. Contrasting the national statistics of 1847 and 1945, he showed that, while the birth-rate declined from 31·5 per 1000 to 16·1, the death-rate fell from 24·7 to 11·4, infant mortality from 164 per 1000 live births to 47, and maternal mortality from 4·52 to 1·84. Against the acute infectious diseases, to which the public-health service has paid special attention, considerable success has been attained; but this does not apply to all of them, and the increase of the tuber-ulosis death-rate early in the war showed the precariousness of our attack. Nor does Sir Allen think that the ncreases in the deaths from respiratory and circulatory diseases and from cancer can be lightly dismissed on the ground that we must all die of something:

> "Many of these deaths are preventable in that they are curable if treated early. Very many, particularly the respiratory disorders, occur in young children. Coronary thrombosis carries off many of our most able citizens in middle age. Death from rheumatic carditis can be largely reduced, if not prevented. Cancer is a serious cause of death well before the age of 65. It is gratifying that increasing attention is now being given to gerontology, or the study of old age, and its causes, but we must recall Professor Crew's words: the real problem is not 'how to give years to life but life to years.'"

Unfortunately, continued the president, the M.O.H. still does not possess the tools needed for his job: he ought to have complete morbidity figures for his own area, and, if it is large, for the various sections of it. In the future every doctor must be imbued with the principles of preventive medicine, asking himself, for each patient, "Why is he ill? Could this illness have been prevented? If so, how?" Before very long there will no longer be the two camps of curative and preventive medicine, for all who look after patients will combine curative and preventive work. Nevertheless there will always be room for the specialist in preventive medicine, and his rôle will be increasingly important, covering communal hygiene, industrial hygiene, epidemiology, the care of the convalescent and the disabled, the teaching of health, and administration. At the health centre "we will have administrative duties in which we are all well trained. The duty of an administrator is to ensure that the proper tools, auxiliary staff, and accommodation are provided for the executives to do the job." Freedom from the pressing cares of managing a hospital service will give the M.O.H. more time to develop his functions as a specialist in preventive medicine.

At the beginning of their second century, Sir Allen Daley called on his hearers to carry on the torch of preventive medicine, which should illuminate with increasing strength the whole medical field.

ANÆSTHESIA IN RETROSPECT

THOUGH a hundred years have passed since Robert Liston operated under ether, we should not, in celebrating this memorable centenary, ignore many earlier successes. Prof. Charles Singer, who took the chair at the Royal Society of Medicine's meeting on Oct. 16, had the agreeable task, fulfilled with elegance, of reminding those present of Adam, of the anæsthetic sponge, of mandragora, henbane, and prickly lettuce, of mesmerism, of Boccaccio's *Decameron* (suitably expurgated), and of the poet Southey's view that the atmosphere of the very highest heaven is composed of laughing gas. Dr. Barbara Duncum, who had the more mundane duty of outlining the development of inhalation anæsthesia in the second half of the nineteenth century, contributed solid facts to an informative afternoon. The modern development of anæsthesia was confided to Dr. Joseph Blomfield, who told of the year 1900 when we had chloroform, ether, and nitrous oxide and nothing else; of ethyl chloride, useful for short operations on children; of open ether ("some of you may even have given it"); of spinal anæsthesia; of Knapp's venous congestion, rectal ether, oral chloroform given with paraffin and followed by half a glass of port; of premedication, endotracheal ether, intravenous anæsthetics, and many another technical advance or experiment.

At the end of the meeting Dr. E. Ashworth Underwood startled the company with an original piece of research, bringing strong evidence to show that Liston's famous amputation was not the first operation in Europe to be done on a patient under general anæsthesia, but that two surgeons in his native town of Dumfries, at the instigation of a fellow Scot, Dr. James Fraser, had quietly performed an amputation on an etherised patient about a month or six weeks before Liston got round to his. Fraser knew Morton in America, and when he came home on a visit he seems to have persuaded Dr. McLaughlin and Dr. Scott, at the Dumfries Infirmary, to try sulphuric ether on a patient with a fractured limb—probably some time in November, 1846. Liston, of course, did his operation on Dec. 21, 1846.

This painstaking piece of historical research, which seems likely to carry the priority honours from England to Scotland, was unfortunately delivered at the end of the session to a closely packed hall whose atmosphere was itself somewhat anæsthetic. More justice was done to it, however, at the Wellcome Historical Medical Museum, where an exhibition on the history of anæsthesia was opened by Lord Moran later in the afternoon. Here some of the relevant documents were well displayed, together with early works on analgesics, and many types of inhaler used in early experiments. The case for the patient, too, has been generously included in the form of a song, to be sung to an air from "The Beggar's Opera," which appeared in the *Illustrated London News* of Jan. 30, 1847:

How happy could I be with Æther
  Were mesmeric charmers away,
But while they perplex me together
  The Devil a word can I say.
Sing Robinson, Thomson, and Cooper,
  Fol Lol de Rol, Lol de Rol, Lay
There's nothing like Æther and Stupor
  For making a hospital gay.

WE have to record that Dr. T. WARDROP GRIFFITH, emeritus professor of medicine in the University of Leeds, died on Oct. 21. He was in his 86th year.

---

[1] To appear in full in the November issue of *Public Health*.

Special Articles

THE SPIRIT IN WHICH WE WORK

THOUGHTS ON ST. LUKE'S DAY *

Sir ALFRED WEBB-JOHNSON, Bt.

PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS

It is the tradition of our calling that the poorest and humblest has just as great a claim on our services as the highest and most affluent. The measure of their need is the measure of our help. Thus it was that Sir Frederick Treves, when his Sovereign, King Edward VII, thanked him for his life-saving attentions, was able to reply with pride: "Sir, you have had as much care and skill in your illness as the humblest of your subjects."

Such is the service that it is our privilege and duty to render, but we have been only too conscious of the limits of our ability—limits imposed by lack of adequate facilities. We have known that there were serious gaps in our service, and have realised that those gaps could only be filled with the help of the State.

The State is about to take a great part in British medicine. This is not surprising, for medicine is of wholly unique importance for the very existence of social life. But, "as the master builder must care for the whole building—so he that undertaketh to set it out (and use it) must seek out fit things for the adorning thereof." This will be our special and immediate task. We must first ensure that the conditions of service are such as to allow intellectual freedom, and to give character as much chance as cleverness. We must avoid the development of Molière's type of doctor, who thought it more honourable to fail according to rule than to succeed by innovation.

We must guard against uniformity, for the highest products of the human mind are the outcome of freedom and variety rather than of uniform organisation. Independence, which inspires fearless advice, must be preserved. In fact, if any of the essential freedoms of a great profession are threatened, then, in the interests of the people, there must be revision of the plan. Even when a system has been formed there may still be much to add, to alter, and to reject.

A PERSONAL SERVICE

The doctor's work is primarily a personal service, and his calling exacts the utmost that man can give—full knowledge, exquisite judgment, and skill in the highest, to be put forth, not at any self-chosen moment, but daily at the need of others. But illness is essentially a personal event. It consists of the individual himself. The patient is not limited by his outer covering. His surface is not his real frontier. A man may be more interested in his environment than in his own body. His position in the community or some work to which his passion drives him may appear to be of more importance than life itself. Thus it is that the family doctor has often to be his patient's confidant and friend, for, as Francis Bacon said: "No receipt openeth the heart but a true friend to whom you may impart griefs, joys, fears, hopes, suspicions, counsels and whatsoever lieth upon the heart to oppress it."

Then again, in Trotter's words, "the well-equipped clinician must possess the qualities of the artist, the man of science, and the humanist, but he must exercise them only in so far as they subserve the getting well of the individual patient." He must feel directly responsible *to* his patient, not *for* him—to someone else. It is a hard doctrine, but none the less true, that this essential function of the doctor—the care of the given patient—may involve the forgoing of exactly scientific diagnosis, of the artistic perfecting of an operation, or even of the interests of society at large. In his care for the individual the method of the doctor is so different from that of Nature:

> "So careful of the type *she* seems,
> So careless of the single life."

Those of us whose work lies in the hospitals must be prepared for changes under a new organisation. We must see to it, however, that we carry into the national hospitals the same spirit which inspired us in the great voluntary hospitals. There we learned to scan gently our brother man—judging not, asking no questions, but meting out to all alike a hospitality worthy of the Hôtel-Dieu, and deeming ourselves honoured in being allowed to act as its dispensers.

We must keep the souls and individuality of our hospitals alive, for hospitals are human institutions. No rigid plan, without margin or elasticity, will suffice or succeed. Above all, the State must not try to control development too strictly, for hospitals are also scientific institutions, and the essence of science is change.

MORAL RESPONSIBILITIES OF SCIENCE

We are vitally concerned with the application of scientific discoveries for the benefit of mankind. In our own time inventions and developments have followed each other fast as falling leaves, and the great blessing is that the leaves from the tree of science have been largely for the healing of the people. Advances have been achieved by the method of experiment—the method which, beyond all shadow of doubt, is the most effective implement for the advancement of knowledge ever invented by man. Moreover, it satisfies man's inveterate instinct not to confide his weight to a branch until he has tested it.

The greatest discovery in modern medicine is the detection of the minute bodies which cause many diseases, and the means by which they are carried. We now know that the carriers of many death-dealing diseases are not angels or demons, messengers of wrathful gods, but common things like flies, mosquitoes, lice, and fleas. We have but lately realised that we may be able to control or destroy these winged vectors of disease. Millions on millions of lives could be saved and the morale of native peoples raised by the prevention of malaria alone.

The millions that are saved must be fed. They must be reckoned with. This will be a problem for future generations—our task and duty are clear. As Carlyle wrote: "Let a man do his work; the fruit of it is in the care of Another than he." And again: "it is not thy works, which are all mortal, infinitely little, and the greatest no greater than the least, but only the spirit that thou workest in, that can have worth or continuance."

That is the point—*the spirit that thou workest in*. Scientific discoveries are powers for evil as well as for good. Is it not time that we decided that their use for the wholesale and indiscriminate destruction of human life should be outlawed? It is not only physical and chemical knowledge that can be misapplied, for biological discoveries might also be used for bacterial warfare. Is it not more in accord with our traditions and ideals to follow the example of Jenner, who, when England and France were at war, sent Woodville to Paris to help to control an epidemic of smallpox which was raging in the French capital! To commemorate this humanitarian action there stands at Boulogne today a statue to Jenner inscribed: "À Edward Jenner—La France Reconnaissante."

It may be that Man is at the cross-roads. Will he proceed higher and further, or will he bring about the catastrophic ending of the whole human story? Will he be swept aside by the Great Creator as an experiment that has failed? It is for man to decide his own fate

---

* Part of an address delivered in Liverpool Cathedral on Oct. 20, 1946.

His further and higher development depends on his own conscious efforts.

As more and more secrets are wrested from Nature we realise more and more clearly that there is no real conflict between faith and science. The laboratory can satisfy many of our needs, but not those of the spirit, so:

> "Let knowledge grow from more to more,
> But more of reverence in us dwell."

Belief is the healthy act of a man's mind. And does ot every true man feel that he is himself made higher y doing reverence to what is really above him?

In order to realise the moral responsibilities of science e must look to something higher, and something beyond ir own little lives. We must turn our minds to things hich have immortality. We inherit ideas and teachings hich are imperishable and everlasting.

Our best works are inspired by the thought that we are aking a contribution to the good of our successors, or to e advancement of ideas, institutions, and causes which ave continuity and permanence. As Lord Balfour said, t the end of a long life of public service: "By so much s we give of ourselves, our labour, and our loyalty to hings which have immortality, by so much shall we ncrease the joy of life and remove the sting from death."

OCTORS IN GOVERNMENT DEPARTMENTS

UNIFIED SALARY SCALES

THE different Ministries have hitherto had different cales of pay for doctors in their employ. With effect rom the beginning of this year these scales have now been nified in Government departments generally and also in he principal health departments, including the Ministry f Health, the Ministry of Education, the Ministry of abour, the Department of Health for Scotland, the Velsh Board of Health, and the Board of Control. Ve understand that the whole subject of salaries for edical staffs in Government departments may again be eviewed when the remuneration of other doctors participating in the National Health Service has been settled. Ieanwhile the scales for London will be:

GENERAL SERVICE.—*Medical Officer*, £1000 on entry at ge of 35, with annual increases of £30 to £1300, and thence y £50 increments to £1400. (The starting salary is reduced y £30 for each year of age under 35, and increased by £30 or each year of age over 35, up to 40.) *Principal Medical fficer*, £1400, with annual increases of £50 to £1600. *Director*, 1600, with annual increases of £50 to £1800.

HEALTH DEPARTMENTS.—*Medical Officer*, £1150 on entry t age of 38, with annual increases of £30 to £1300, and hence by £50 increments to £1500. (The starting salary is educed by £30 for each year of age under 38, and increased y £30 for each year of age over 38, up to 40.) *Senior Medical fficer*, £1500, rising annually by £50 to £1700. *Principal edical Officer*, £1600, rising annually by £50 to £1800.

NOTE.—In the Ministry of Health, since changes were ade a few months ago (*Lancet*, 1946, i, 932), the grade of edical officer has included those engaged in the health ervices and the regional and deputy regional medical officers n the insurance service. The grade of senior medical officer includes the former principal regional medical officers, the insurance divisional medical officers, and certain former senior medical officers. Two of the posts of principal medical officer (insurance and epidemiology) at present carry salaries of £2000, without increments. The new arrangements make certain provisions for safeguarding the "expectations" of doctors already in Government service.

In about a dozen large provincial towns the London standard rates as set out above will be reduced by £40 per annum on salaries up to £1300, and by £50 on salaries above that figure. Elsewhere in the provinces he deductions will be £80 and £100 respectively. Under present arrangements most of the more senior appointments in the health departments are in London.

The scales apply equally to men and to women.

BRITISH ORTHOPÆDIC ASSOCIATION

MINISTERS AS GUESTS

A DINNER held in London on Oct. 18 in connexion with the association's annual meeting, was attended by the Prime Minister, the Minister of Health, the Minister of National Insurance, and a number of overseas guests.

Sir HENEAGE OGILVIE, proposing The Association, outlined the rapid progress of orthopædics from the time, not so long ago, when its exponents had been an oppressed minority. Mr. GEORGE PERKINS, replying as president, avowed the need in each region for orthopædic centres, which should be centrally directed by a consulting orthopædic surgeon; there should also be a large orthopædic teaching centre, under a full-time staff. Salaries should be sufficient not only to attract good men but to enable orthopædists to visit other clinics.

Sir REGINALD WATSON-JONES, who proposed The Guests, welcomed, among others, Dr. Henry Meyerding (U.S.A.), the new president of the International Orthopædic Association, and Prof. E. Sorrel (Paris). He thought it time to end the anomaly by which the man who breaks his leg on Saturday afternoon receives less compensation than he would for the same injury sustained at work on Saturday morning; compensation is, he said, the community's responsibility and should be uniform. He declared himself against controls, preferring the wild English rose to ordered rows of cultivated tulips.

Mr. C. R. ATTLEE, in his reply, said that "we have to be careful today, when our man-power position is as acute as it was in time of war, that we do not waste our population, either by leaving unremedied remediable disabilities, or allowing the unnecessary creation of disabilities"; and he looked very much to the work and influence of the orthopædic surgeon. The National Health Service Bill would be placed on the statute-book by Parliament, but its implementation depended on the whole population. The happiest people, he suggested, quoting the example of Denmark, are to be found in the most equalitarian countries. "We do not want to see people regimented; but I believe just as in a good army, without loss of discipline, there is scope for initiative and energetic action by individuals, so in all our health activities there will be freedom, but freedom on an ordered plan of coöperation."

Mr. ANEURIN BEVAN contrasted the acrimony among politicians with the harmony between doctors. Each branch of medicine, he had noticed, considered the others to be its superior. "Members of the Royal College of Physicians emerge flushed with enthusiasm for the Royal College of Surgeons; and fellows of the Royal College of Surgeons regret there is not room for their college in Trafalgar Square"; specialists were concerned for the general practitioners, and general practitioners for the specialists. "The most eloquent politicians in Great Britain are to be found in the medical profession. Indeed, I've been learning quite a few tricks in the last year or two, and I hope to use them for the benefit of the medical profession." The politician's duty was to universalise the best. He had seen men suffer because they did not have the benefit of existing knowledge: "the specialist is not always available when he is needed." The health service must be organised in the most effective manner. "It is not my task to stand between the doctor and his patient. It is the task of the public-health services to put the best kind of medical apparatus in the hands of the profession, and it is for the profession to use it freely and independently for the benefit of their patients. . . . I am happy to say that enthusiasm grows. My relations with the British Medical Association grow more friendly week by week. Before long I am quite certain that we shall reach a cordial understanding and obtain coöperation in carrying out this great work."

Mr. JAMES GRIFFITHS said that insufficient attention had been given to the Industrial Injuries Act which had taken the injured person out of the grip of the employer; in its field, it was the best thing for half a century. Miners, he said, deserve special recognition, for among them occur half the country's industrial injuries.

LONDON'S VOLUNTARY HOSPITALS

THE continued practical interest of the public in the voluntary hospitals of London during 1945 is well demonstrated in the Annual Statistical Summary for that year just published by the King's Fund.[1] Despite a decrease of £67,000 in the income from public authorities, the total maintenance income of the 164 hospitals reached a record figure of £6,879,000; in addition £156,000 was given for endowment and £439,000 for building and equipment, making a grand total of £7,474,000, or £523,000 more than in 1944.

Income from subscriptions and donations rose by £135,000 to £1,276,000; patients' contributions by £227,000 to £1,120,000; and contributory schemes by £175,000 to £912,000. Legacies, a source of income which many predicted would suffer as the result of death duties, high taxation, and other adverse economic conditions, rose by £121,000 to £676,000. If "free legacies" are included, no less than 74·5% of the total maintenance income came from sources other than public authorities. Maintenance expenditure amounted to £6,466,000, or £625,000 more than in 1944, leaving a surplus for 1945 of £413,000.

The number of new inpatients rose from 206,000 to 236,000, and the average number of beds occupied daily from 10,447 to 12,797. The number of new outpatients was 1,641,000 and the number of outpatient attendances 7,888,000.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED OCT. 12

Notifications.—Smallpox, 0; scarlet fever, 1106; whooping-cough, 1362; diphtheria, 269; paratyphoid, 6; typhoid, 3; measles (excluding rubella), 2005; pneumonia (primary or influenzal), 351; cerebrospinal fever, 37; poliomyelitis, 22; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 44; puerperal pyrexia, 156; ophthalmia neonatorum, 69. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Oct. 9 was 835. During the previous week the following cases were admitted: scarlet fever, 59; diphtheria, 22; measles, 13; whooping-cough, 35.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (1) from enteric fever, 1 (1) from measles, 12 (0) from whooping-cough, 5 (0) from diphtheria, 44 (2) from diarrhœa and enteritis under two years, and 9 (3) from influenza. The figures in parentheses are those for London itself.

There were 4 fatal cases of whooping-cough at Manchester. Liverpool and Manchester each reported 6 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 258 (corresponding to a rate of 26 per thousand total births), including 35 in London.

---

[1] Statistical Summary for 1945: King Edward's Hospital Fund for London, 10, Old Jewry, E.C.2. Pp. 62. 1s. (1s. 6d. post free).

MIDWIVES' PAY

EMPLOYING authorities have been advised by the Ministry of Health to adopt new recommendations by the Midwives Salaries Committee. These include a special service allowance of £20 at the end of each year's full-time employment for all (other than pupil) midwives. It is hoped that this grant may encourage more women who have the necessary qualifications to practise. The committee has now completed its review of all salaries. Under the revised scale a matron of a maternity hospital with 100–199 beds will receive a salary (inclusive of emoluments) ranging from £550 to £750, compared with the old range of £450 to £650; and a new inclusive salary ranging from £600 to £825 is recommended for matrons of institutions with 200 or more beds. Corresponding increases are recommended for matrons of the smaller hospitals and homes; and assistant matrons in institutions with 50 or more beds will now receive £410 to £485. Resident district midwives will now have a salary of £290 to £380, compared with the former £240 to £300. The committee has also recommended that part-time midwives should be given credit for years of previous service; and employing authorities are given discretion to increase the appropriate salaries by 10%.

In England Now

A Running Commentary by Peripatetic Correspondents

THE fact that hard-working G.P.s are given the task of allocating the nation's milk is certainly not an inducement to take up medicine. True, we are given a list of deserving cases entitled to extra milk, and on the face of it our task is easy. A pregnant woman gets her 1½ or 2 pints daily; so do sufferers from G.U. or T.B. That we can understand, but here comes the rub. Why does a man with a broken arm, being "an active worker on the panel," get his daily pint while our edentulous old dears in the 80's get nothing extra? Questions like this are unanswerable. Of course, we may stretch a point and give an occasional pint under the all-embracing 2c, but why do we have to wangle things? Our patients try to understand our difficulties, but they often make it worse. In my most oft-recurring nightmare I see myself surrounded by yellow cards with shadowy voices. There is the stiff upright card: "I don't want treatment, but I need my milk." There is the drooping bent card: "The milkman says he's got plenty; all he wants is a certificate." There is the crumpled and shabby old card: "I've had a glass of milk for supper all through the war; the other doctor gave it to me; I can't sleep without it." They draw near. They point accusing corners at me. In my dream I even see the often offered shilling. Mercifully the phone rings and the dream is gone, but the question remains. We were never taught about milk certificates at our medical schools. No examiner questioned us on this knotty point. We are simple people. We try to be fair to all and we please none. We are the scapegoats of the Ministry of Food and we don't like it.

* * *

Having bought a really new house I was determined not to lose it to the anarchists. (I feel sorry for them, but I am determined to assert myself too!) The house had recently been left empty, and pending the move from the present one into the new one I suggested that my wife should put up some curtains. "Curtains!" she scoffed. "They wouldn't keep me out if I were a squatter." While I was distempering the empty rooms between visits the idea arrived—I would get all our friends who could spare the time during the local rush hour to come in and look round and spend as long as they could offering suggestions.

One evening this was in full swing, with cars parked all over the place and a fearful hullabaloo going on, those in the garden calling to those in the bedrooms, when a young man walked in through the gate and produced a notebook. "This is it," I murmured to myself. He came towards me, as I was the tallest in sight, and asked, "Are the squatters in?" adding, "I'm from the *Bull Valley Tribune*, the local rag, y' know."

"Young man," I said, looking as unbalanced as I could, "are you in need of a home, a haven from the tortures and affliction of the world, where the upward-licking flames from the fiery furnace below cannot reach . . .?" He seemed to take in the situation in one terrified glance. "No," he said; "not at all, thank you sir," and he left hurriedly, without shutting the gate.

Two days later the professional plate which I had ordered months ago arrived, so I hurried down to the new house and put it up. Patients and friends alike (they have long ago forgiven me) agree that the plate has finally decided the issue between anarchy and order. "After all," they say, "when you have your name on it. . . ." Which is saying something, even in these days.

* * *

There ought to be a course of instruction in testimonial writing. Just now many of us are enjoying the exceedingly difficult experience of sitting in judgment on youthful aspirants to honorary staff appointments. So erudite, so distinguished do they all appear that they inspire in us a sense of shame at being accepted as competent arbiters and a sense of self-congratulation that in our day competition was less acute. What tests should we employ in a decision so momentous? How can we prepare ourselves to hold the scales in fairness to the claims of the applicant and to the interests of the hospital and, it may be, of the medical school?

I don't know. Errors in judgment are notorious. I ecall a man who was selected on the most enthusiastic ecommendation of a president of the R.C.P., a president whose integrity and wisdom were universally accepted and revered. For thirty years this paragon blocked the path of anxious, embittered juniors, and during that thirty years he was a useless encumbrance who taught nobody anything and made not the smallest contribution to medicine. Alternatively every school exhibits its inability to recognise exceptional potentiality and to deplore the loss which has proved a rival school's gain.

To assist us in our deliberations we have—testimonials. In many instances these comprehend no more than a bare recital of the applicant's appointments and other details of his career which we could learn for ourselves by consulting the *Medical Directory*. The majority of others consist of platitudinous assurances that "he is a sound physician," "has an extensive knowledge of medicine," "is hard-working and conscientious," "I think he would prove a very agreeable colleague," "he has read extensively," "is of stirling character" (yes, the misspelling has appeared on not a few occasions).

Of more value—indeed it ought to be of very great value—is the personal letter. Now this calls for considerable care in its composition unless it leads the recipient to read between the lines and conclude that it emanates as a formal response to a request rather than from a genuine desire to do all possible for the applicant. Look at these:

> "A. B., who was my house-physician, is applying for the vacancy of assistant physician at your hospital. Unless you have somebody outstanding, you might do worse than select him."
>
> "I have not worked with A. B. personally but I am told he is a very good physician."
>
> "Although I can only speak from second-hand experience, I should say his work in the war was well above average."
>
> "As far as I could judge, he was entirely trustworthy."
>
> "He is an excellent teacher of the *list* type." (I suppose this interpreted means—you have been warned !)

Being damned with faint praise is bad enough, but there is a far graver danger to the seeker after testimonials. In my early days I encountered a sequence of failures until a real friend dropped a pretty broad hint that I would never be selected anywhere so long as I presented a testimonial from Dr. X. In my innocence I had congratulated myself on being sponsored by this prosperous and celebrated physician. How was I to know that this man whom I had thought to be famous and distinguished had a reputation among his colleagues which led them to substitute the adjectives infamous and notorious, a man whom the ladies called a duck and other doctors labelled quack ? Presumably the converse holds good, although I find it difficult to visualise anyone with the confidence to utilise a testimonial of the opposite kind because it was written by one "of whom," in the words of Milton, "to be dispraised were no small praise."

* * *

Having just returned from a 1500-mile tour through Germany, I am happy to be able to announce the cause and cure of the "German problem." From time to time the Germans hear rumours that other nations possess beds in which it is possible to sleep, and, since conquest is the only means of acquisition known to the German mentality, they immediately start a war of aggression. The cure is therefore obvious. Compel the Germans to manufacture and make up their beds according to civilised specifications and they will remain in them tranquilly ever after. When I think of the tripartite boards that pose as mattresses, the absence of pillows, the untucked sheets, the . . . but far abler pens than mine have spent themselves in vain on that supreme example of Teutonic masochism.

* * *

Talking of the discretion of the British press, a woman starting a play group in London approached the advertisement manager of a national paper and unfortunately mentioned that the group was to be run on psychological lines. His response was immediate and final. "Psychology; no, we cannot touch this. We bar advertisements dealing with psychology, astrology, racing tips, and rubber goods."

Letters to the Editor

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—Dr. Milligan's interesting paper raises many issues, but it is particularly towards the presentation of the material that criticism may be directed.

New treatments are judged by the careful selection of material, accurate diagnosis, criteria of recovery, adequate follow-up, and finally by acceptable presentation. In this paper all these points are open to criticism.

1. No criteria are given for the selection of cases, nor is there evidence of adequate examination preceding treatment.
2. The published case-histories leave room for doubt as to the correctness of the diagnosis ; for example, case 7 could well be an involutional melancholia.
3. "Recovery" apparently depends on "stability," but we are given no hint of the method adopted in forming this judgment.
4. Only case 5 has an adequate follow-up. It is a pity that some of the cases followed for 5 years have not been included.

These points are a sufficient criticism of the presentation of results ; but further information is required for general recognition of this new method of treatment. Scant consideration is given to the possibility that these patients have been "electrically leucotomised." Hypochondriacal features are most noteworthy in the histories ; and the work of Freeman and others has indicated the effects of leucotomy on the chronic complaint habit. The question of deterioration is also most briefly considered ; we are given a dogmatic denial of Brodie's findings, but no supporting evidence ; and the absence of gross memory disturbance does not rule out deterioration, as Professor Golla has shown in leucotomy cases.

With the memory of other enthusiastic first reports on physical methods of treatment in psychiatry and their subsequent fate, I cannot feel that we are yet justified in recommending our neurotic patients to enter mental hospitals for this treatment. Even with electrical convulsions to "Music While You Work," the lay public will, I fear, continue to regard the mental hospital as a madhouse.

London, W.1. P. H. TOOLEY.

SIR,—Dr. Milligan's article is courageous and impressive. But, despite the recovery-rate, it contains features that give rise to concern.

He advocates this method for selected cases, but offers no criteria for selection, apart from chronicity—the duration apparently ranging from 2 to 20 years. Nor are the "general lines" of treatment in case 6 clear ; surely the treatment prior to convulsive therapy might have been described.

Plausible as is the explanation by Brain and Strauss, is it a sound basis for giving up to four major convulsions daily, or for producing a condition in which the patient is reduced to the infantile level, with double incontinence ? What proof is there that gross damage has not been done by the repeated severe neuronal disruption ? Even if sequelæ are not immediately evident, they may still be forthcoming.

Dr. Milligan is indeed fortunate not to have seen protracted memory defects in these cases. I have under observation a woman of 25 with an anxiety state, who had previously been given 18 major convulsions in 6 weeks, and who now has a profound memory-defect for recent and remote events—a defect that impairs intellectual work. Though convulsive therapy may have a place in the treatment of psychoneuroses, its adoption as recorded by Dr. Milligan cannot be accepted with unreserved enthusiasm.

Todmorden. NORTHAGE J. DE V. MATHER.

SIR,—Of his 100 cases of psychoneurosis treated intensively by electrical convulsions Dr. Milligan classifies 52 as recovered on discharge, and he claims that a further 45 or 46 were much improved, most of them symptom-free. These results might appear to compare favourably with those of psychotherapy carried out under hospital conditions, while the amount of the physician's time occupied in the administration of treatment seems to have totalled rather less than five minutes apiece in the

LONDON'S VOLUNTARY HOSPITALS

THE continued practical interest of the public in the voluntary hospitals of London during 1945 is well demonstrated in the Annual Statistical Summary for that year just published by the King's Fund.[1] Despite a decrease of £67,000 in the income from public authorities, the total maintenance income of the 164 hospitals reached a record figure of £6,879,000; in addition £156,000 was given for endowment and £439,000 for building and equipment, making a grand total of £7,474,000, or £523,000 more than in 1944.

Income from subscriptions and donations rose by £135,000 to £1,276,000; patients' contributions by £227,000 to £1,120,000; and contributory schemes by £175,000 to £912,000. Legacies, a source of income which many predicted would suffer as the result of death duties, high taxation, and other adverse economic conditions, rose by £121,000 to £676,000. If "free legacies" are included, no less than 74·5% of the total maintenance income came from sources other than public authorities. Maintenance expenditure amounted to £6,466,000, or £625,000 more than in 1944, leaving a surplus for 1945 of £413,000.

The number of new inpatients rose from 206,000 to 236,000, and the average number of beds occupied daily from 10,447 to 12,797. The number of new outpatients was 1,641,000 and the number of outpatient attendances 7,888,000.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED OCT. 12

Notifications.—Smallpox, 0; scarlet fever, 1106; whooping-cough, 1362; diphtheria, 269; paratyphoid, 6; typhoid, 3; measles (excluding rubella), 2005; pneumonia (primary or influenzal), 351; cerebrospinal fever, 37; poliomyelitis, 22; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 44; puerperal pyrexia, 156; ophthalmia neonatorum, 69. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Oct. 9 was 835. During the previous week the following cases were admitted: scarlet fever, 59; diphtheria, 22; measles, 13; whooping-cough, 35.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (1) from enteric fever, 1 (1) from measles, 12 (0) from whooping-cough, 5 (0) from diphtheria, 44 (2) from diarrhœa and enteritis under two years, and 9 (3) from influenza. The figures in parentheses are those for London itself.

There were 4 fatal cases of whooping-cough at Manchester. Liverpool and Manchester each reported 6 deaths from diarrhœa and enteritis.

The number of stillbirths notified during the week was 258 (corresponding to a rate of 26 per thousand total births), including 35 in London.

---

1. Statistical Summary for 1945: King Edward's Hospital Fund for London, 10, Old Jewry, E.C.2. Pp. 62. 1s. (1s. 6d. post free).

MIDWIVES' PAY

EMPLOYING authorities have been advised by the Ministry of Health to adopt new recommendations by the Midwives Salaries Committee. These include a special service allowance of £20 at the end of each year's full-time employment for all (other than pupil) midwives. It is hoped that this grant may encourage more women who have the necessary qualifications to practise. The committee has now completed its review of all salaries. Under the revised scale a matron of a maternity hospital with 100–199 beds will receive a salary (inclusive of emoluments) ranging from £550 to £750, compared with the old range of £450 to £650; and a new inclusive salary ranging from £600 to £825 is recommended for matrons of institutions with 200 or more beds. Corresponding increases are recommended for matrons of the smaller hospitals and homes; and assistant matrons in institutions with 50 or more beds will now receive £410 to £485. Resident district midwives will now have a salary of £290 to £380, compared with the former £240 to £300. The committee has also recommended that part-time midwives should be given credit for years of previous service; and employing authorities are given discretion to increase the appropriate salaries by 10%.

In England Now

A Running Commentary by Peripatetic Correspondents

THE fact that hard-working G.P.s are given the task of allocating the nation's milk is certainly not an inducement to take up medicine. True, we are given a list of deserving cases entitled to extra milk, and on the face of it our task is easy. A pregnant woman gets her 1½ or 2 pints daily; so do sufferers from G.U. or T.B. This we can understand, but here comes the rub. Why does a man with a broken arm, being "an active worker on the panel," get his daily pint while our edentulous old dears in the 80's get nothing extra? Questions like this are unanswerable. Of course, we may stretch a point and give an occasional pint under the all-embracing 2s, but why do we have to wangle things? Our patients try to understand our difficulties, but they often make it worse. In my most oft-recurring nightmare I see myself surrounded by yellow cards with shadowy voices. There is the stiff upright card: "I don't want treatment, but I need my milk." There is the drooping bent card: "The milkman says he's got plenty; all he wants is a certificate." There is the crumpled and shabby old card: "I've had a glass of milk for supper all through the war; the other doctor gave it to me; I can't sleep without it." They draw near. They point accusing corners at me. In my dream I even see the often offered shilling. Mercifully the phone rings and the dream is gone, but the question remains. We were never taught about milk certificates at our medical schools. No examiner questioned us on this knotty point. We are simple people. We try to be fair to all and we please none. We are the scapegoats of the Ministry of Food and we don't like it.

* * *

Having bought a really new house I was determined not to lose it to the anarchists. (I feel sorry for them, but I am determined to assert myself too!) The house had recently been left empty, and pending the move from the present one into the new one I suggested that my wife should put up some curtains. "Curtains!" she scoffed. "They wouldn't keep me out if I were a squatter." While I was distempering the empty rooms between visits the idea arrived—I would get all our friends who could spare the time during the local rush hour to come in and look round and spend as long as they could offering suggestions.

One evening this was in full swing, with cars parked all over the place and a fearful hullabaloo going on, those in the garden calling to those in the bedrooms, when a young man walked in through the gate and produced a notebook. "This is it," I murmured to myself. He came towards me, as I was the tallest in sight, and asked, "Are the squatters in?" adding, "I'm from the *Bull Valley Tribune*, the local rag, y' know."

"Young man," I said, looking as unbalanced as I could, "are you in need of a home, a haven from the tortures and affliction of the world, where the upward-licking flames from the fiery furnace below cannot reach . . .?" He seemed to take in the situation in one terrified glance. "No," he said; "not at all, thank you sir," and he left hurriedly, without shutting the gate.

Two days later the professional plate which I had ordered months ago arrived, so I hurried down to the new house and put it up. Patients and friends alike (they have long ago forgiven me) agree that the plate has finally decided the issue between anarchy and order. "After all," they say, "when you have your name on it. . . ." Which is saying something, even in these days.

* * *

There ought to be a course of instruction in testimonial writing. Just now many of us are enjoying the exceedingly difficult experience of sitting in judgment on youthful aspirants to honorary staff appointments. So erudite, so distinguished do they all appear that they inspire in us a sense of shame at being accepted as competent arbiters and a sense of self-congratulation that in our day competition was less acute. What tests should we employ in a decision so momentous? How can we prepare ourselves to hold the scales in fairness to the claims of the applicant and to the interests of the hospital and, it may be, of the medical school?

and woman—for instance, work, food, housing, and clothes. It was not that these were provided, but that the individual need not worry about their provision, which enhanced the sense of security.

With the end of the war, morale inevitably worsened. The sudden disappearance of the overriding communal motive, together with the natural relaxation after a period of tension, would have sufficed to make a disruptive social picture even without the loss of the sense of security resulting from material shortages, the return of forgotten husbands to homes "otherwise occupied," the unconscious guilt of those who left their families, and the less unconscious (even if still unjustified) guilt of those who stayed at home.

To restore morale we have to restore both the sense of purpose and the sense of security. It might be possible to maintain morale, as the Russians seemed to be doing, by inventing new fears of war which would bind the people together against a common, even if so far a hypothetical, enemy; but to do this would require a further denial of democratic government which our people would fortunately not tolerate. It would in any event only delay the realisation of the individual's, as opposed to the State's, insecurity.

To return to the problem of health. The sense of security is to a much larger extent than is generally realised dependent on interpersonal contact between members of a community, and to a much smaller extent on the physical conditions of security. We may therefore aim at increasing social contact between people. There is ready to hand an adequate motive for health-giving activity in a war-weary country: *recreation.* A blueprint for action along these lines is, I think, to be found in the accounts of that admirable social experiment, the Pioneer Health Centre at Peckham. By laying emphasis on recreation, a motive is provided which is universally acceptable and which is persistent. By providing a focus for interpersonal exchange and communal integration, and by having the centre run under the guidance of properly trained biologists, every opportunity is given for the development of the sense of security. Morale is improved and a rich soil prepared for the seeds of health education.

Dr. Kennedy speaks of the need for more recreational facilities and for more biologists. It is important to emphasise that these two must be closely linked. Biology is the science of life; and inasmuch as "recreation" is a subject for science, it is the biologist's responsibility. In conclusion, we may remind ourselves that medical education—at least up to 1939—used a fragmentary rather than a holistic approach; and that our profession is primarily oriented toward the relief of illness, secondarily toward the maintenance of health, and only thirdly toward the enhancement of positive health. In the nature of medical work, as at present taught and organised, we see more and think more about disease than about health. A great deal of hard thinking and versatility will be required by our profession if we are to make a real contribution to this problem.

Narborough, Leicestershire. JAMES R. MATHERS.

PILONIDAL SINUS

SIR,—Mr. Patey and Professor Scarff (Oct. 5, p. 484) make two questionable assertions.

(1) They say there is a world of difference between sacrococcygeal cysts and tumours of undoubted developmental origin and pilonidal sinus. They claim that the pilonidal sinus is higher in the natal cleft, but those of us whose lot it is to see a disproportionate number of children's posteriors have seen many more than the 16 cysts and tumours of developmental origin which Raven collected in London museums. It is true that some of these are very near the anus but most are high up and all grades are seen from the massive dermoid to the short sinus and dimple.

(2) They stress the importance of hair in the ætiology. Surely this very fact emphasises the developmental origin of the pilonidal sinus. The body hair does not grow until stimulated by puberty hormone levels, and it is the young adult in whom the symptoms first develop most commonly. It is difficult to believe that the tough tissues of the sacrococcygeal region can be pierced by a human hair which has been sat on.

One of the reasons for so many failures in treatment during the war has been that the advent of powerful chemical bacteriostats has tempted the surgeon to "try his luck" and close primarily the gaping chasm of his wise and wide excision. Healing *of* the bottom *from* the bottom must still remain a fundamental rite.

London. D. F. ELLISON NASH.

TUBERCULOSIS FOLLOWING INJECTION

SIR,—Several interesting points emerge from Mr. Ebrill and Dr. Elek's account of a tuberculous abscess arising at the site of a previous intramuscular injection of penicillin (Sept. 14, p. 379). Although the authors do not use the term, it is clear that they regard the abscess as an example of *primary* tuberculosis (i.e., arising in a previously uninfected individual, who would have been tuberculin-negative had he been tested before the penicillin injection). One cannot, of course, be dogmatic, but the clinical details given are far more suggestive of a *post-primary* tuberculous abscess (i.e., arising in a previously infected allergic individual, whose Mantoux reaction would have been positive previously had it been tested). Such a post-primary abscess *could*, of course, have arisen as a result of introducing virulent tubercle bacilli during the penicillin injection, but this is extremely unlikely. Bacilli accidentally inoculated into tuberculo-allergic individuals in this way are usually effectively dealt with by the body's defence mechanism, as was first shown many years ago by Koch when he described what is now known as the Koch phenomenon. The most likely explanation is, I think, the one which Ebrill and Elek dismiss as a practical impossibility—namely, that the abscess arose as a blood-borne infection. Such disseminated tuberculous abscesses are by no means rare in sanatorium practice, particularly in the so-called hæmatogenous type of disease, and in the case described the hæmatoma appears to have acted as a *locus minoris resistantiæ.* The fact that clinical and radiological examination has revealed no other tuberculous focus is, of course, inconclusive; it is quite common not to find a primary tuberculous focus in persons undergoing Mantoux-conversion while under observation (e.g., in sanatorium staff). In such cases the site of infection may be in the alimentary tract.

Two clinical details would have been helpful. Firstly, no mention is made of the presence or absence of inguinal adenitis. With a large primary tuberculous abscess of the thigh, caseous adenitis of the regional lymph-nodes would almost certainly have occurred, while "drainage" glands of a post-primary abscess, if examined by biopsy, could have been distinguished histologically by the relative absence of caseation. Secondly, no mention is made of the type of bacillus recovered from the pus. The finding of bovine bacilli would have been a pointer, admittedly a weak one, to the presence of a bovine alimentary infection.

It might be of interest to note that by a curious coincidence two patients and a possible third have been admitted to this hospital during the last month, each with lupus verrucosus of the hand following an injury involving a breach of skin surface. It is tempting to picture the very natural reaction of sucking the injured member (and both patients have active pulmonary lesions), but it is far more probable that these are also examples of a hæmic infection of a *locus minoris resistantiæ.* The well-known association of injury with other tuberculous conditions, such as tuberculosis of joints, is also very much to the point.

Dr. Marsh's statement (Oct. 5, p. 508) that "tubercle bacilli are not uncommon in the dust of hospital wards" cannot be allowed to pass unchallenged, since it tends to perpetuate the erroneous belief that sanatoria and tuberculosis wards are dangerous places in which to work because of the risks of infection from dust. Since Cornet, in 1889, claimed to have found tubercle bacilli in 40 out of 140 specimens of dust from various German hospitals, public buildings, and tuberculosis wards,[1] belief in the rôle of dust as one of the chief infective agents in tuberculosis has been widely held, although few modern tuberculosis pathologists now subscribe to

---

[1] Cornet, G. *Z. Hyg. InfektKr.* 1889, 5, 191.

7 cases quoted, as against the many hours required for psychotherapy. Even the doubtful acceptance of such results might encourage those who are planning our National Health Service to fob off the unfortunate sufferer from psychoneurosis with some more or less harmful form of physical treatment, under the pretext that it is the most modern and effective known to medical science.

I suspect that Dr. Beaton's treatment is in all essentials a regression to the therapy of the last century, fortified by modern apparatus.

Some 37 years ago, as a young man in general practice, I was called out very urgently to a woman said to be on the point of death. In a poor house in a mean street I found, in the centre of an excited crowd of neighbours, a married woman of about 35 lying apparently unconscious, but performing forced respiration with amazing energy. I could find no signs of physical disease, but my questions elicited no response of any kind from the patient. Being satisfied that I had to deal with an exhibition of hysteria, I turned everyone out of the room and sat down quietly with notebook and pen to observe the patient, whose breathing still continued violent and rapid. She probably noticed the sudden change from confused noise to complete silence, and after a minute or two opened her eyes and looked at me. I said: "Don't you think you might *as well stop that performance? It must be very tiring.*" Her respiration became normal immediately, and she began to cry. After about five minutes of this I asked her whether she felt better; she said she did. I pointed out severely that she had caused much unnecessary alarm to her friends by her behaviour, and left after obtaining her promise not to do it again. I was quite pleased with my successful treatment, and so were the relatives and friends. Only the patient seemed to have no sense of relief or satisfaction, and I remember being struck by her attitude of quiet despair in contrast with her former excitement; but I was not interested in the case except as providing an opportunity for showing my skill in handling an hysterical outburst. I did not see her again, but I think I should have been called by the relatives if there had been any return of her symptom; the case was probably cured, by Dr. Milligan's standards.

Ten years later, having begun to learn something of the causes and treatment of this kind of illness, it occurred to me that if my understanding had been greater I should perhaps have encouraged this patient to tell me what was really troubling her, with the probable result that her display of emotion would have lasted very much longer while her relatives might have been called upon to improve their relationship with her. No doubt everyone except the patient would have regarded me as a very incompetent doctor; yet I might have performed a service of the greatest importance to the patient. As it was I had only intimidated her from further self-expression by a metaphorical bucket of cold water.

Is intensive electro-convulsive treatment really an advance upon the bucket of cold water which used to be the treatment for hysterical manifestations most favoured by bold therapists in the nineteenth century? In selected cases—and Dr. Milligan's cases were carefully selected—it commonly resulted in the complete disappearance of symptoms (sometimes, one gathers, for good), and results might have been still better if it had been applied intensively and unemotionally.

I do not deny that intensive convulsive therapy may be expected to produce more permanent results. It seems likely from Dr. Milligan's account that it is followed regularly by the commencement of a process of mental deterioration, and it may be that this, like leucotomy, damages the symptom-producing structures; but if this is so, such treatment should be reserved for the most desperate cases, after careful consideration by a responsible medical board.

Other questions present themselves. Does the theory, adopted by Dr. Milligan, that Dr. Beaton's method obliterates entirely the faulty electrical patterns of the brain mean that electro-encephalograms recorded before and after treatment showed the disappearance of *abnormal rhythms?* If not, does it mean anything? On what basis were these 100 cases selected for publication from the larger number of psychoneurotic patients treated by intensive electro-convulsive therapy? And does an average dose of "180 volts at 0·4 sec." mean anything but a large unmeasured dose?

These questions are minor matters, and it may well be that the intensive method described will prove valuable for the treatment of some severe cases which might otherwise be properly subjected to leucotomy. The large issue is between the view that the patient should be treated in the way that is best for him individually, and the opposed view that treatment should be adapted to the convenience of those who have to apply it and those who have to pay for it. I would suggest that the patient and his human environment should both receive full consideration. Each should be represented on a board which would consider on its merits every case in which it might be proposed to take action destructive of the integrity of human life; such actions would include the termination of pregnancy for reasons other than the preservation of the life of the mother, prefrontal leucotomy, and intensive convulsive treatment.

If the treatment described by Dr. Milligan is considered justifiable in the case of ordinary psychoneurotic patients, it seems to follow that it should be used also on habitual criminals, and then on the masses of ex-Nazis whose re-education is a yet unsolved problem. If Dr. Milligan is right, the "obliteration of psychologically unacceptable patterns of thought and conduct" can be effected in a few days, and then someone can carry out the *resynthesis* of their personalities along correct lines. One is glad Dr. Milligan sees that this is a task requiring much care and judgment.

London, W. J. NORMAN GLAISTER.

MORALE OF THE NATION

SIR,—I was glad to see that Dr. Kennedy, in the lecture on Health Education published in your issue of Sept. 21, emphasises the principle of holism in the doctrine of positive health. I was less glad to see that, while he notes the importance of "moral discipline," he is apparently prepared to leave this fundamental aspect of the matter to the individual conscience. In so far as moral discipline affects health, we should make an effort to provide some biological guidance for it.

I suggest that we use the term "morale" instead of moral discipline. Even if no more clearly defined, its various definitions are less likely to be coloured by the emotional prejudices of different sects. Without discussing the definition of the concept of morale (which would only recapitulate what Dr. Kennedy says of the definition of health), one can, for purposes of discussion, divide the factors which influence it into components which foster (*a*) a *sense of security*, and (*b*) a *sense of purpose*. The sense of security is essentially the feeling of "belonging" to a group, and has no implications about the actual physical conditions which might be held to make for security. Its antithesis is the sense of isolation, or "separation anxiety." The sense of purpose is essentially the feeling of "worthwhileness," and can exist apart from any explicitly stated aim or intention.

These two concepts are both aspects of a state of mind which is of course largely unconscious and little subject to deliberate control. Their formulation as separate entities allows us to estimate the value of any particular measure as an aid to morale. The sense of security relates to the individual's potential, while the sense of purpose relates to the direction in which the potential will be used. Needless to say, a particular morale factor will have effects on both aspects: thus a good leader will both provide an adequate motive for action and enhance his followers' sense of security, while the provision of excessive "welfare" facilities may enhance the feeling of security but confuse the sense of purpose.

In war-time, morale was tackled from both angles. The sense of purpose was fostered by repeated (and not always effective) efforts to render war aims explicit; and on a lower but more effective plane by the setting up of "targets"—for production, war savings, &c. The feeling of security was fostered in many ways, by no means all of them deliberate: "One spot of bombing makes the whole town kin," and people came into close contact with their neighbours in a way almost unattainable in peace-time. The necessities of the time caused the State to assume a paternal rôle which relieved many of the day-to-day anxieties of life for the ordinary man

Parliament

THE LORDS IN COMMITTEE

ON Oct. 17 the House of Lords resolved into committee under the chairmanship of the Earl of **DROGHEDA** to consider the National Health Service Bill.

POWERS OF THE CENTRAL COUNCIL

Lord **MORAN** moved an amendment to clause 2 with the purpose of strengthening the Central Health Services Council. The Bill was singularly free from the fault of trying to meet sectional interests at the expense of the community, but he thought it unfortunate that membership of the council had been allowed to grow to 41. This inevitably meant that there must be a number of advisory committees, which were to be appointed by the Minister and to report direct to him, though they would at the same time report to the council. The amendment mpowered the council to appoint these committees nd laid down that they should report to the Minister hrough the council. He thought this vital, for a Minister aced with a council of 41 and an alternative committee f 8 or 9 experts would naturally turn to the experts. hus the committees would do the real work and the ouncil would be largely robbed of its chief function. id this matter? He thought it did, for at present those ctively engaged in the practice of their profession layed little part in administering the service, and it was oped that the council would be a means whereby they ould take an active part, not only once or twice a year ut in every important thing that came before the Minister concerning health. Lord **JOWITT**, the Lord hancellor, in reply, pointed out that the Minister before ppointing a standing committee must consult with the entral Health Services Council. He agreed that it was mportant that the council should be really effective; ut it was rather an unwieldy body, and for that reason nd not because they wanted to belittle the authority f the council the Government felt unable to accept he amendment—which was by leave withdrawn.

ACCESS TO HOSPITALS

The Earl of **MUNSTER** moved an amendment to clause 4 o ensure that voluntary hospitals should not *find after* he passing of the Bill, on instructions from the Minister, that their small rooms must be abandoned and made into large wards. Lord **JOWITT** gave an assurance that these rooms would not be converted unless it was found really necessary in the interest of the whole service, and the amendment was withdrawn.

Lord **LLEWELLIN** moved an amendment to clause 5 allowing a doctor to follow his patient into a hospital even though he was not a specialist on the staff of that hospital. Lord **HORDER** supported the amendment, for he declared it was in the interests of the patient that continuity of treatment should be preserved.

The Earl of **LISTOWEL** pointed out that the effect of the amendment would be that a specialist or practitioner who chose to stay outside the public service would be able to use for his private work hospitals provided at the public expense. Viscount **CRANBORNE** suggested that as the patient had made his contribution to the scheme presumably he had the right to enter a State hospital. The clause as it stood allowed *any doctor on* the staff of a hospital to treat his private patients in that hospital, but the man outside the service could not even arrange for his patients to be treated by someone else at the State hospitals. He was in favour of a State service, but he did not believe that there should be this continual whittling down of private practice so that in effect it was really useless. Lord **ADDISON** pointed out that today medical practitioners who sent their patients into hospital did not follow them. The patients were treated by members of the hospital staff. The amendment was withdrawn.

The Earl of **IDDESLEIGH** moved an amendment incorporating the pledge which the Minister had given that the character of denominational hospitals would be respected, but withdrew it on Lord **JOWITT** promising to consider the matter before the report

HOSPITAL ENDOWMENTS

Viscount **MAUGHAM** moved an amendment extending to the non-teaching hospital the proviso safeguarding the confiscated endowments of the teaching hospitals

> "Provided that the Board shall, so far as practicable, secure that the objects of any such endowment are not prejudiced by the provisions of this section."

In reply Lord **JOWITT** said there was no doubt that by Act of Parliament any trust could be disturbed. Whether it should be was another matter, and he agreed that it should not be done lightly. There was, he pointed out, a profound difference with regard to the endowments of the teaching and non-teaching hospitals. In the teaching hospitals no redistribution was contemplated. The existing funds remained with the hospital, though the board of governors was changed. But *redistribution* was the very essence of the scheme for the voluntary hospitals. The scheme would probably cost the public Exchequer something like *£150 million* a year. Approximately £30 million would come from the insurance contributions, some £10 million from local authorities, and the remaining £110 million from the Exchequer. Of the whole £150 million some £90 million would be expended on hospitals. The reaction of the Treasury officials to this enormous expenditure had been: "If you are going to call on us to find out of public funds this vast sum of money, at least you ought to let us have in return the various endowments to put against our obligations." The Chancellor of the Exchequer had been persuaded to forgo that claim, for the Government was anxious that the hospitals should have some cushion between themselves and the rigours of Treasury control. But it seemed only fair that this *nest-egg* should be redistributed so that all should have a share. The probable capital value of the endowments was something like £50 million which at 3% would give something like £1$^1/_2$ million a year, and even that figure probably contained a not inconsiderable element of the endowments of teaching hospitals. The effect of the amendment would be to smash up the scheme, for there was hardly an endowment which had not been given to some specific hospital. If the scheme became impossible, inevitably the Treasury would say to a hospital which was richly endowed, "You are so well off that you need not have a large amount of public funds," and the whole idea of this cushion would go.

Viscount **SAMUEL** suggested that a comforts fund would really fulfil the purpose of the ancient donors of these endowments, for their only desire was that the sick should be well cared for and happy, and they would not mind very much whether the hospital had the name of Saint So-and-so or was called the Manchester Central Hospital. Therefore it seemed to him that we were fully entitled to endorse a change of trusts which arose out of the different circumstances of our own times. But could not some words be inserted which would ensure that what was done was done without detriment to the general purposes of the endowment and with the intention to fulfil as far as possible the wishes of the donor? For example if it were merely a question of a hospital being named for all time "The 1914–18 War Memorial Hospital" obviously that sort of trust ought to be fulfilled. Lord **JOWITT** replied that he fully accepted Viscount Samuel's example, and that where a gift was *attached to a condition*—such as the upkeep of a garden—he was ready to consider an amendment provided it was limited to such special cases, and did not seek to say that any money merely because it was left to a particular hospital should therefore be exempted from pooling and redistribution.

REGIONAL BOARDS

Lord **ADDINGTON** and Viscount **BRIDGEMAN** moved amendments to ensure that the local health authorities should know what plans the regional boards were making and should have a chance of putting their views to the Minister before any regional plan was finally accepted. The Earl of **LISTOWEL** pointed out that the Minister must include members of local authorities among the people he appointed to the regional boards, and they would no doubt keep their colleagues informed of what was happening. Viscount **SIMON** suggested that the language of the Bill regarding these appointments might this view (e.g., Gloyne[2]; a good summary of the *dust* v. *droplet* controversy is given by Topley and Wilson,[3] who point out that the English climate militates very strongly against the formation of dust containing living virulent tubercle bacilli). Even if one accepts Cornet's work without question, few will deny that personal hygiene is now vastly improved since his day, largely as a result of public-health propaganda; our tuberculous patients no longer spit on the ward floor! Numerous investigators have failed to find living tubercle bacilli in the dust of modern hospitals and sanatoria.

An investigation was recently made at this hospital into the possible infectivity of occupational-therapy articles made by patients. One hundred articles of all types (plastic, wood, wool, felt, &c.) made by patients with all degrees of lung involvement (many producing large amounts of positive sputum daily) were examined carefully in the hospital laboratory, where the technique of cultural examination for tubercle bacilli has been brought to a high standard; not one positive result was obtained. I am sure that this is in large measure due to the careful instruction in the hygiene of cough which is given to all patients. The danger of infection from patients with open pulmonary tuberculosis is not from ward dust but from unrestrained cough. It is clear that this fact needs to be emphasised at a time when hospital and sanatorium domestics are at a premium.

A. G. HOUNSLOW.

County Sanatorium, Clare Hall, South Mimms, Barnet.

FOLIC ACID IN CŒLIAC DISEASE

SIR,—The course of cœliac disease in children is often so protracted, and the prognosis so uncertain, that we venture to draw attention to its treatment with folic acid, a procedure which in a particular case has so far proved dramatically successful.

A boy, aged 17 months, came under the care of one of us (L. G.) in May, 1946. There was a history of vomiting and diarrhœa with the passage of numerous pale bulky and foul-smelling stools during the previous 6 months. He had been under treatment by another doctor during this period, with no improvement.

He presented the typical appearance of cœliac disease —pale, apathetic, with a dry skin and distended abdomen and wasted buttocks, and with the stools as described above. His weight was 19 lb. Treatment with parenteral liver extract 2 c.cm. on alternate days, together with ascorbic acid and 'Benerva' Compound tablets by mouth and a fat-free diet was instituted. Improvement was rapid. The vomiting and diarrhœa ceased and he gained weight.

The child was taken away on holiday, but after a month he relapsed and became extremely ill with a return of his former symptoms. He was admitted to hospital weighing 21 lb., but after a fortnight's stay his condition had deteriorated considerably and he was taken home weighing only 14½ lb. He was then seen in consultation by one of us (H. P. B.) and admitted to hospital in a serious condition. The picture was typical of cœliac disease. He was grossly dehydrated and passing 15–16 stools a day. He could take only very small quantities of skimmed milk with water and glucose. The blood-count showed a secondary anæmia with 52% hæmoglobin and 4,200,000 red cells per c.mm. The total fat in the stools was 49%.

Treatment with parenteral liver extract and vitamin-B complex on alternate days, together with other vitamin supplements and iron by mouth, was begun, and during the next week there was no improvement although no deterioration in his condition and his weight remained stationary.

At this stage a supply of folic acid was obtained and 25 mg. per day was administered by mouth. There was *immediate* improvement. The following day only 2 stools were passed, the appetite returned, and he became much calmer and brighter. From then on he progressed rapidly. His appetite became ravenous and he took a good mixed diet, fat-modified, and passed one or two pale formed and non-offensive stools each day. At the end of a week he had gained 7 lb., and 9 days later he had gained a further 6 lb. At the moment improvement has been maintained but there is still considerable abdominal distension. The dosage of folic acid has been reduced gradually and he is now taking 10 mg. per day. All other treatment has been stopped since the institution of the folic acid.

It is impossible, of course, to draw any general con- clusions from a single case, but we feel strongly that improvement in this case can be attributed solely to folic acid.

No doubt intensive trials in this direction are going on, but we have so far seen no recorded work on the treatment of cœliac disease in children with folic acid.

H. P. BRODY.
Sheffield. L. GORE.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—I am anxious to correct two impressions that Mr. Deitch's provocative and stimulating letter of Oct. 19 may give.

He mentions that for two years I have treated all cases of acute perforation conservatively and "with uniform success." This series was reported at a meeting of the Leeds Medico-Chirurgical Society in February, 1946. I did not invent the conservative method any more *than Hermon Taylor did.* Many surgeons *practise* conservative treatment in selected cases, and it was not until Bedford Turner reported 6 cases (*Brit. med. J.* 1935, i, 457) that I had the courage to treat all cases without selection. Further, I have lost 3 cases since the discussion in February, which makes the mortality 18% in my small series. I agree with your leader of Oct. 5 that since we have no means of determining which ulcer will close spontaneously, conservative treatment will inevitably cause the surgeon more anxiety than simple closure, which, in Mr. Deitch's hands, carries a mortality of only 4%. This remarkable record, extending over eight years, fully justifies his belief in spinal anæsthesia and no drainage-tube.

Our experience in York differs from Hermon Taylor in two respects. We found considerable constitution disturbance in several cases, the pulse-rate rising t 130 per min. and the temperature to 103° F, fallin gradually to normal by the eighth day, and we had patients who developed subphrenic abscess, a complic tion which I had never met after closure without drainag

We have been more impressed by the results prevention of perforation than with the conservativ treatment after the catastrophe has occurred. B treating all cases of peptic ulcer with severe symptom as requiring urgent admission, and by accepting f surgical treatment all cases who we think are unlike to benefit permanently by medical treatment, we hav reduced the incidence of acute perforation by 44 during the last three years. Acute perforation in th York area has now become a rarity; the majority cases admitted are visitors to the district, transpo drivers, or passengers in trains. The few locals wh perforate "out of the blue" will always defeat ou efforts to anticipate, rather than wait for, this dreade complication.

York. A. HEDLEY VISICK.

PRICE OF POLYTHENE.—In his article of Sept. 14 (p. 38 Dr. Kent remarked that polythene costs about 1*s*. 2*d*. per Imperial Chemical Industries Ltd. point out that the minimu price of 'Alkathene,' the British grade of polythene the manufacture, is 3*s*. 3*d*. per lb.

SODA-LIME.—Already a familiar laboratory reagent, sod lime is now widely used in medical practice for the absorptio of carbon dioxide. Apparatus for closed-circuit anæsthesi oxygen therapy, and metabolism determination are a fe examples of its uses. Messrs. *Sofnol* Ltd., Westcombe Hil Greenwich, S.E.10, the makers of 'Sofnol Brand' soda-lim claim that their product possesses advantages such as con stancy of composition, high absorptive capacity, resistance t abrasion, and non-heating and non-deliquescent propertie Their catalogue, illustrated by easily understood graph describes in a simple way the experiments on which thes claims are based. These tests will be of interest to thos who are unfamiliar with the type of laboratory investigation to which a specimen of soda-lime must be submitted before it value as a CO_2-absorbent for medical purposes can be assessed the regional boards were to be permitted or obliged to delegate their powers.

---

[2] Gloyne, S. R. Social Aspects of Tuberculosis, 1946, p. 23.
[3] Topley, W. W. C., Wilson, G. S. Principles of Bacteriology and Immunity, 1936, pp. 1028–29.

Lord Jowitt admitted that the regulations did not yet exist, but pointed out that there would be opportunity to discuss them in Parliament. Broadly, the regulations would lay down that certain matters fell within the province of the management committees—for instance, the engaging and dismissal of staff, with the exception of senior staff. He did not suppose there would be an appeal to the board if the committee dismissed some servant. That would be interfering with the discretion of the committee unduly. He suggested that the new system whereby a nurse became a servant of the regional board, though she could contract to serve at a particular place if she liked, might lessen the recruiting difficulties of today.

Lord Inman, though he wished to see definite powers given to the management committee so far as this amendment was concerned, saw definite advantages in the Government's scheme. At his own hospital, to which several hospitals were affiliated, they had found that the nurses liked to move from one small hospital to another. Viscount Cranborne asked whether it would not be possible to distinguish between different types of staff. "Officer" was an all-embracing word. Could not the management committees control staff such as porters, who were unlikely to want to wander round the region? The amendment was negatived.

LOCAL-AUTHORITY SERVICES

Lord Addington moved an amendment permitting a county council on application from a borough to delegate to it functions relating to the care of mothers, young children, employment of midwives, health visiting, home nursing, vaccination, and so forth. The amendment also gave the borough council the right of appeal to the Minister if its application was refused by the county council. Lord O'Hagan moved further to extend the amendment to urban district councils. The amendment, Lord Addington declared, would provide a maximum of local control, attract voluntary effort, and permit the degree of delegation to vary according to circumstances. Lord Jowitt replied that in the past there had been a good deal of overlapping and confusion in the exercise of these functions, and their distribution was chaotic. Now that a new set of powers were being imposed on local health authorities, which it was hoped in the fullness of time would be performed at health centres, it was a matter of moment to entrust these duties only to major authorities, which meant the counties and county boroughs. The only exception was the care of children, which would follow the pattern imposed by the new Education Act. Lord Henley thought it would be unfair to the county councils to take away bits and pieces of their areas and spoil the continuity of their services. Viscount Cranborne thought that a proviso should be added to the amendment allowing delegation only subject to the approval of the Minister. To this suggestion the Earl of Listowel promised to give consideration, though he feared that even so the amendment would undermine the scheme for coördinating the services. The amendments were withdrawn.

METROPOLITAN BOROUGHS

Lord Balfour of Burleigh moved an amendment providing that the London County Council should delegate the functions cited in the last amendment to the metropolitan boroughs. Local government in London, he pointed out, was different from anywhere else in the country, and the functions relating to maternity and child welfare had never been exercised by the L.C.C. Over the past 50 years they had been delegated to the metropolitan borough councils, and the L.C.C. was still on record as being in agreement with that position. The boroughs had a very good record, and he did not think that under the Bill the services could be maintained at the same level of efficiency. But for the fact that London local government was a thing by itself, these great boroughs would have been made county boroughs long ago.

Speaking as a Parliamentarian, Lord Jowitt was not too much moved by the plea of an agreement reached between the L.C.C. and the borough councils outside Parliament. At the time of the agreement the L.C.C. were going to keep their [illegible]spitals, and presumably as they did not want to have too much on their plate passed these functions to the boroughs. Now the position was different and the L.C.C. felt that they had time to conduct these services themselves.

Lord Balfour thought Lord Jowitt had made an astonishingly good case considering he had not a leg to stand on, but with 25 years' experience as a borough councillor behind him he assured the House that they would spoil a good service if these functions were transferred to the L.C.C. The amendment was carried by 35 contents to 15 non-contents.

FROM THE PRESS GALLERY

When is a Nurse Not a Nurse?

On Oct. 14 in the Commons Mr. Alfred Edwards moved to annul the Nurses Amendment Regulation 1946. When the Nurses Act of 1943 was under discussion the Minister of Health, then Mr. Ernest Brown, in a letter, gave an assurance to the Christian Science movement that he would provide by regulation that nothing in the Act should prevent the using of the name or title of "Christian Science Nurse" by a member of the Church of Christ, Scientist, who was certified by the church to be qualified for employment as a nurse by members of the church. Had the movement not received this assurance they would certainly have moved an amendment to the Act. Nobody, Mr. Edwards declared, was entitled to claim a monopoly on a word or name. There were only 40–50 of these registered nurses in the country. No-one was allowed to practise as a Christian Science Nurse who had not completed 5 years' training and been recognised by the department. It would be impossible to engage a Christian Science Nurse in mistake for a medical nurse. Mr. G. Cooper, who seconded the motion, pointed out that the words "Christian Science Nurse" were used in the by-laws of the mother church in Boston, and even if the regulation went through it would be impossible to prohibit the use of the phrase in the literature issued by the movement.

Mr. Wilson Harris, though admitting he was no admirer of Mary Baker Eddy, supported the motion, for he was depressed by the high-handed action of those estimable people who wished to arrogate a common English word to their own purposes. He thought it reasonable to debar anyone from improperly using the term "registered nurse," but if in the phrase "Christian Science Nurse" the two Archbishops did not object to the use of the word "Christian," nor the Royal Society to the use of the word "science," why should anyone object to the use of the word "nurse"? Even the medical profession was less exacting, and the Chancellor of the Exchequer, though he could only pocket taxes and could not attack poxes, had the right to be termed "doctor." Mr. F. Messer pointed out that those interested in the question had had no knowledge of the correspondence taking place between Mr. Brown and the Christian Scientists, and he refused to be bound by an undertaking given by a Minister without consultation. The nursing profession was in dire need of recruits who he thought would only be gained if it won the status of a real profession. If the door were opened to the Christian Scientists it would have to be opened to everyone else.

Mr. A. Bevan explained that when he took office he was faced with a prayer to annul Mr. Brown's proposed regulation giving exemption to Christian Science Nurses. He therefore withdrew the regulation in the hope that a compromise could be reached. This had not proved possible so he had therefore introduced the present regulation. He admitted we were attempting to constrain the English language, but that happened whenever we made a charter and gave a specific meaning to a name. In the care of the sick, nursing, he ventured to suggest, was as important as any other branch of the medical profession. These women resented that after an arduous training they were known by a name which anyone could adopt. All the other exemptions to the Act were within the hierarchy of nursing itself. If he exempted the Christian Science Nurses where could he stop? He would have a stream of applications for exemptions and a great body of fine women would have been deeply and mortally offended. The motion was defeated by 245 votes to 43.

be strengthened, and Lord LISTOWEL agreed, for, he declared, the intention was that representatives of the local authorities should be included. The amendment was withdrawn.

The Earl of MUNSTER pointed out that the Bill had now been before Parliament for six solid months and asked whether the Government could not now give some information as to the size of the regions. Lord JOWITT said he wished he could but to be frank he could not. There was a great deal of negotiation to be done, and it would be foolish to attempt anything in a hurry.

FUNCTIONS OF THE HOSPITAL MANAGEMENT COMMITTEES

Lord LUKE moved an amendment seeking to readjust the functions of the regional boards and the hospital management committees by omitting the subsection particularising the duties laid on the boards—to appoint staff, maintain premises, and acquire equipment and furniture. Why, he asked, could not the hospital management committees have powers from the boards similar to those enjoyed by the teaching hospitals from the Minister? The committees would be formed of trustworthy people appointed by the Minister and be left to manage the affairs of the hospitals. The boards would have enough on hand planning their regions and generally giving guidance. To take the appointment of staff from the committees would raise difficulties of divided loyalties and remote control, and put the non-teaching hospitals at a disadvantage compared with the teaching hospitals. To have a floating population within the region capable of being moved at a moment's notice might make it difficult for a hospital to get and keep a team together. If the Minister wanted suitable people to become members of the committees he must give them suitable responsibility.

Lord JOWITT agreed that if people were to work on the hospital committees they must be given a real job to do. The issue was how to achieve this. The Government intended to prescribe by regulations that the hospital management committee should do all things in regard to the running of their hospital, but that they should do them on behalf of the regional board. The appointment of officers—except perhaps senior servants—should be in the hands of the committee, as would be all expenditure, other than the building of a new wing or anything of that sort. The Government expected that the committees would have wide powers covering practically everything except questions of major policy. But they thought it better not to impinge upon the principle that the regional board was the authority and the hospital management committee the agent acting on behalf of the board. If there were any dispute between the two the legal position would then be plain.

Lord LLEWELLIN thought that all would agree that as much power as was proper should be left to the committees. But in the Bill he felt it was being done in the wrong way. To get good men to serve, these committees must be made a reality and not just a kind of camouflage. Their responsibilities must be placed in the forefront of the shop window and not prescribed afterwards by regulation. Viscount SIMON pointed out that in the future these things would be construed not according to what had been said in the House of Lords but according to the language of the Bill: while laying particular duties on the regional boards, Parliament had not given the hospital management committees any defined duty. Under this clause it would be lawful for a Minister to say, "Oh, I do not think much of this hospital committee. I think on the whole that any regulations it may make should be subject always to the ratification of the regional board." The Marquess of READING suggested that it might be some time before the regulations dealing with the functions of the committees could be passed. Yet surely to enlist support for local hospital committees people should know at the earliest possible moment, in the clearest possible terms, and by the best possible instrument—which was the Bill itself—what the functions of the committees were to be.

Lord JOWITT replied that as part of a coördinated scheme the committees were to act as the agents of the boards. He was anxious that there should be no demarcation disputes and that the boards should have unquestioned authority. But he was equally anxious that the boards should exercise their powers by leaving a wide discretion to the committees. He would discuss the clause further with his advisers; but to keep the legal position clear he thought it should stand, though he hoped there would be such a wide measure of devolution as would satisfy the noble Lords.

Lord LUKE withdrew his amendment.

MEDICAL STAFF COMMITTEE

Lord MORAN moved an amendment that a separate house committee should be set up in each hospital in every group, and that each hospital should have a medical staff committee with a right to nominate members to the hospital management committees. The medical staff committee which flourished in all our voluntary hospitals was a unique instrument for keeping the hospital up to date in practical matters. But in municipal hospitals its place was taken by a single medical superintendent. Lord HORDER thought that the principle was vital but that the exact relationship between the committee and the management committee was a domestic matter. "If it is not the intention of the Minister to disallow the formation of medical staff committees, I think an assurance to that effect would be satisfactory."

Lord JOWITT said it was obvious that a hospital b[illegible] must be set up to run the individual hospitals under the jurisdiction of a hospital management committee; and save in rare cases, such as a fever hospital working with a general hospital, that would be done. It was also true that we must have medical staff committees, but he was reluctant to mention them in the Bill; for a good many committees would have to be set up—on nursing and dietetics, for instance—and if one were singled out it would look as if there were not to be any others.

In withdrawing the amendment Lord MORAN urged that it was important that in this matter municipal practice should be brought into accord with voluntary practice.

Lord MORAN moved a further amendment to provide that in teaching hospitals facilities for medical teaching and research as required by the university or medical school should be supplied. A bed in a teaching hospital might well be more expensive than in another hospital, and a time might come when a hospital used for teaching might be accused of extravagance. Professors of medicine and surgery throughout the country had signed a memorial on this point, for they felt that if the functions of the teaching hospitals were not put down on paper it might weaken their case later when they came to argue about the necessary provisions for carrying out teaching and research. Lord JOWITT agreed that besides the care of the sick the teaching hospital had an added function which might be even more important. He thought the amendment went a little too far, but he undertook to consider the matter with a view to drafting suitable words, and the amendment was withdrawn.

LEGAL STATUS OF HOSPITAL MANAGEMENT COMMITTEES

Lord LLEWELLIN moved an amendment to allow hospital management committees to sue or be sued. This was something, he asserted, that had to be settled at once for it could not be altered by regulation afterwards. Lord JOWITT recalled that the committees when acting as principals—in relation to research or in the administration of their own property—could be sued in the ordinary way. It was only when acting as the agents of the regional boards that they could not be sued. In a coördinated scheme there must be a chain of authority, and on this point he was not in a position to make a concession. The House accordingly divided, and the amendment was carried by 59 contents to 17 non-contents.

APPOINTMENT OF HOSPITAL OFFICERS

Lord LUKE moved an amendment enabling the Minister by regulation to empower the hospital management committees to employ officers other than specialists or consultants. The Earl of LISTOWEL stated that there already was power in the Bill to make a regulation of this kind. Lord MAUGHAM asked how the House could be expected to decide on this Bill when so much was left in the air to be determined by regulations. Why was there nothing in the Bill to show that the main management of the hospitals was confined to the management committee? The Marquess of READING asked whether ut in his day none existed. Years before the last war e anticipated its coming and its character better than ost of us, and recommended the provision of hospital helters. In 1939 he was due to retire, but instead he ndertook full-time administrative work in the E.M.S., here his time-saving orderliness and thoroughness stood is many medical "clients" in good stead.

Generous to his juniors, gentle and courteous to his ospital mothers, a hard worker in spite of indifferent ealth, he would push for others but never for himself, nd medical women owe him much for the doors he pened on their behalf.

"Those of us who worked with Owen," writes a colleague, "will always remember him for his keen insight into the problems which faced him, and his extraordinary sympathy and tact with little children. No trouble was too great when dealing with a patient, whether in hospital or in private, and the careful notes in his small, tidy but difficult handwriting, were a model of what case-taking should be. He had a valuable collection of clinical data, which the retiring nature of his character seemed to prevent him from publishing to any large extent."

His wife, who shared fully in all his interests, is left ith a son and daughter.

IAN MACKENZIE DAVIDSON

M.D. GLASG., F.R.C.S.E.

Dr. Ian Davidson, who died at Carlisle on Oct. 14 at the age of 30, leaves a gap that might have been made by many an older man, for he had packed much into his short life. The son of Mr. Norman Davidson, F.R.C.S.E., of Glasgow, he entered Glasgow University from Rugby and graduated M.B. in 1938. After holding a house-appointment in the Glasgow Victoria Infirmary, he went as ship's surgeon to the Far East. At the outbreak of war, he volunteered for the R.A.M.C., and after his discharge on medical grounds served as house-physician and house-surgeon at the Cumberland Infirmary, Carlisle, during 1940. The following year, after an interval during which he wrote his thesis on parkinsonism which was accepted for the M.D. degree in 1942, he returned to the Cumberland Infirmary as surgical registrar. While holding this post he obtained his Edinburgh fellowship, and in 1943 he was appointed assistant surgeon to the Infirmary, later becoming surgeon to the E.M.S., consulting surgeon to the Victoria Cottage Hospital, Maryport, and surgeon to the City General Hospital, Carlisle.

He was blessed with unusual gifts of mind and body, and his engaging charm and genuineness won him many friends. A sound surgeon, he had a deftness of hand that reflected a quick and steady brain, and the maturity of his judgment belied his youth.

His widow, Dr. Josephine Cartwright, D.R.C.O.G., of Edinburgh, and their year-old daughter, survive him.

T. McL. G.

HENRY HANNA

M.A., M.B., B.SC. R.U.I.

Mr. Henry Hanna, who died in Belfast on Sept. 28, was widely known throughout the Province, for generations of medical students had passed under his keen scrutiny, and he had a large private practice in diseases of the eye, ear, nose, and throat. For close on 40 years he had worked at the City Hospital, where he held the appointment of visiting ophthalmic surgeon at the time of his death. He retired from the staff of the Royal Victoria Hospital in 1939.

Born in 1874, he received his early education at Belfast Royal Academy while his university career was spent between Queen's College, Belfast, and St. John's College, Cambridge. The old Royal University of Ireland conferred upon him a B.A. in 1894, and two years later he graduated M.A., B.SC. In the following years he worked at Cambridge but he returned to Ireland to begin his medical course, and he took his M.B. in 1903. After holding a resident appointment in the newly built Royal Victoria Hospital, Belfast, and a demonstratorship in the department of anatomy, he spent some time in the eye, ear, and throat clinics of Vienna before returning to practise in his chosen specialty at Belfast. He served as president of the Irish Ophthalmological Society, the Ulster Medical Society, and his special section at the British Medical Association meeting in Belfast in 1937. But though he had held these offices with distinction he preferred his own fireside or the company of his friends whom he delighted with his dry wit.

"Outside medicine," writes J. R. W., "Hanna's interests were varied. He was often to be seen on the golf links, but perhaps his greatest joy was fishing in a quiet stream. He had a genuine appreciation of art and his collection includes many valuable pictures as well as a beautiful selection of porcelain and old Irish glass."

His widow survives him with two daughters.

Appointments

BEATTIE, W. M., M.CHIR. Camb., F.R.C.S.: assistant surgeon, David Lewis Northern Hospital Branch, Royal Liverpool United Hospital.

FRIPP, A. T., B.M. Oxfd, F.R.C.S.: consultant orthopædic surgeon, public health department, London County Council.

GUTTMANN, E., M.D. Munich, L.R.F.P.S.: assistant clinical director, Maudsley Hospital, Denmark Hill.

LEYS, D. G., D.M. Oxfd, F.R.C.P.: consulting pædiatrician, County Hospital, Farnborough, and North-West Kent.

LUCAS, B. G. B., M.R.C.S., D.A.: research assistant in anæsthetics, University College Hospital medical school, London.

MENDL, K., M.D. Prague, D.M.R.: radiotherapist, Swansea General and Eye Hospital.

SMITH, A. G., M.D. Glasg., F.R.C.S.: medical referee for dermatological cases under the Workmen's Compensation Act, 1925, for county court districts in circuits 32 and 33.

THOMAS, R. C., F.R.C.S.E., M.R.C.O.G.: consulting obstetrician and gynæcologist, County Hospital, Farnborough, and North-West Kent.

Examining Factory Surgeons:

BOWER, C. E. W., M.B. Vict., D.P.H.: Stretton, Cheshire.
CAMPBELL, A. M., O.B.E., M.B. Glasg.: Cumnock, Ayr.
GREGSON, A. H., M.B. Manc.: Cromer, Norfolk.
GUTHRIE, G. A., M.B. Glasg.: Nairn.
MACLEAN, R., M.B. Aberd.: Ullapool, Ross.
MORRISON, D. N. B., M.B. Glasg.: Braemar, Aberdeen.
WATSON, K., M.D. Dubl., F.R.C.S.E.: Redhill, Surrey.

Empire Rheumatism Council:

NICHOLSON, D. P., M.B. Lond., M.R.C.P.: registrar at West London Hospital.
SHIERS, DUNCAN, B.SC., M.B. Wales, M.R.C.P.: registrar at Roya Mineral Water Hospital, Bath.

Silicosis Medical Board: New Members

FREEBAIRN, N. A., M.B. Glasg.
PIERCE, J. W., M.D. Lond., M.R.C.P.
ROGERS, ENID M., M.D. Wales.
TURNER, G. E. M., M.R.C.S.
WILLIAMS, WYNDHAM, M.B. Edin.

Births, Marriages, and Deaths

BIRTHS

EVANS.—On Oct. 17, in London, the wife of Dr. John Evans—a son.

GARROD.—On Oct. 10, in London, the wife of Dr. Oliver Garrod—a daughter.

GIBBS.—On Oct. 12, at Mackenzie, British Guiana, the wife of Dr. D. S. Gibbs, of Hove—a son.

GLASS.—On Oct. 21, in London, Dr. Norma MacLeod, the wife of Dr. R. M. Glass—a son.

KERSHAW.—On Oct. 5, at Mansfield, the wife of Dr. Robert Kershaw—a daughter.

LAZARUS.—On Oct. 1, the wife of Dr. Samuel Lazarus, of Glasgow—a daughter.

O'CONNOR.—On Oct. 12, at Abingdon, the wife of Dr. G. F. O'Connor—a son.

ROSENVINGE.—On Oct. 12, at Harrogate, the wife of Dr. Gerald Rosenvinge—a son.

SMYTH.—On Oct. 17, at Brighton, the wife of Captain Greville Smyth, R.A.M.C.—a son.

THOMAS.—On Oct. 11, at Northampton, the wife of Dr. S. F. Thomas, M.B.E.—a daughter.

WHEELDON.—On Oct. 15, in London, the wife of Dr. F. T. Wheeldon—a son.

WOOLLEY.—On Oct. 18, at Derby, the wife of Dr. E. J. S. Woolley—a daughter.

MARRIAGES

ABRAHAM—CLARK.—On Oct. 15, at Aughton, Everard Cecil Abraham, M.C., M.D., to Doris Irene Clark, J.P.

BEAL—READE.—On Oct. 19, John Hugh Bruce Beal, B.M. Oxfd, F.R.C.S., to Mary Bettina Reade.

HILL—AKRED.—On Oct. 19, in London, Major Francis E. Hill, of Loxwood, Sussex, to Alice Akred, M.B.

READ—BRODIE.—On Sept. 25, at Penang, Malaya, Marten Turner Read, M.C., M.R.C.S., to Alison Garland Brodie.

THOMAS—GIRVAN.—On Oct. 17, at Pinner, David Francis Thomas, F.R.C.S., to Jean Isobel Girvan.

DEATHS

DAVIDSON.—On Oct. 14, at Carlisle, Ian MacKenzie Davidson, M.D. Glasg., F.R.C.S.E., husband of Dr. J. A. Davidson (*née* Cartwright).

HARRIS.—On Oct. 18, Henry Arthur Clifton Harris, M.R.C.S., of Appledram, Ditchling, Sussex, aged 73.

HOWIE.—On Oct. 14, at Eastbourne, Robert Howie, M.B. Glasg., aged 75.

PHILP.—On Oct. 13, at Preston Hall, Maidstone, James Daniell Philp, M.R.C.S., aged 29.

TURNER.—On Oct. 15, at Shirlett Sanatorium, Shropshire, Frederick Thomas Turner, M.C., M.R.C.S., medical superintendent.

Obituary

CHARLES SAMUEL MYERS

C.B.E., M.A., M.D., SC.D. CAMB., LL.D., F.R.S.

Dr. Myers, one of the first psychologists elected to fellowship of the Royal Society, died at his home near Minehead on Oct. 13. A few days earlier he had attended the celebration of the 25th anniversary of the National Institute of Industrial Psychology, of which he was founder and principal.

Charles Samuel Myers was born on March 13, 1873. From the City of London School he went to St. Bartholomew's Hospital for a year and thence to Caius College, Cambridge, of which he was later to become an honorary fellow. He won Foundation and Shuttleworth scholarships, and took a double first in the natural sciences tripos, but still found time to exercise his keen interest in anthropology and in music; and he himself played the violin expertly. He returned to St. Bartholomew's Hospital to complete his medical training, and soon after qualifying in 1897 he joined McDougall, Seligmann, Ray, Wilkin, and Haddon on the Cambridge University expedition to the Torres Straits and Sarawak. Myers's part was ostensibly to study native music, but his experience at this time coloured his subsequent work in psychology. On returning to this country in 1899 he took a house-appointment at Barts, but he soon abandoned clinical medicine. He remained in London, first as lecturer, and, after 1906, as professor of psychology, until in 1909 he returned to Cambridge as lecturer in experimental psychology and director of the psychological laboratory. In 1911 he became first president of the British Psychological Society, whose journal he edited until 1924.

Sport & General Press Agency

The first world war found Myers slightly over age for the R.A.M.C., but he went to France as a civilian and became a hospital registrar at Le Touquet. Soon he worked his way into the Army; he became consulting psychologist to the B.E.F., and also took a guiding interest in the training centre set up at Maghull, where instruction was given in the application of psychological principles to the war psychoneuroses. The emergency attracted the energies not only of Myers but of W. H. R. Rivers, Elliot Smith, and William McDougall—a band of scientists whose work had previously borne little relation to clinical medicine. They had an important share in opening up what was then a new field, and Myers himself contributed five articles to our own columns during the war years. He also carried out spare-time research for the Admiralty on the selection of hydrophone listeners. The pioneer's path, however, was not easy, and his book *Shell-shock in France, 1914–18* reflects the sense of frustration he experienced and his relief when his task could be relinquished.

The end of his active participation in medical psychology was marked by a vigorously controversial letter in THE LANCET of Dec. 27, 1919, in which he condemned physical interference in the treatment of hysteria.

> "It is high time that the medical profession should decide whether it is justifiable for a physician to tell lies to his patient with the object of effecting a cure by suggestion, and on the basis of such lies to perform a serious operation with that object. . . . During the war there were certain physicians who would explain to a patient suffering from functional hemiplegia that the cortical cells on one side of his brain were out of order. . . . And they would proceed to tone up the disordered cells by painful faradism. . . . I have always been convinced that such measures are not only needless, but also dangerous. If the patient is not cured by the electricity or the sham operation, his latter state is far worse than his previous one, because henceforth he firmly believes in an 'organic' basis of his condition. If, on the other hand, he is cured, he may at any future time fear or fancy a recurrence of his 'orga malady."

He had gained the F.R.S. in 1915, and on his return Cambridge had been eager to put his subject even mo clearly on the map. In 1920 he was promoted to readership; but he was denied the support he from scientists and philosophers, and on reflection decided to give up his academic life and to join with London business man, H. J. Welch, in the foundation the National Institute of Industrial Psychology. He he found scope for his abilities in his successful teachi that the humanising of industry by study of the worke comfort, the adjustment of working conditions, and th fitting of the right man to the right job could be carri out only with the aid of psychology.

Mr. Alec Rodger writes: "The National Institute wa Myers, and Myers was the National Institute; but it may be questioned whether he was altogether happy in his new life. In some ways he relished his constructive task, but now he had little time for teaching, and very little more for research. Moreover, the support he obtained from industry was scant. He became too preoccupied with financial problems and relationships with other bodies, public and private, to be able to give as much attention as he wished to science. Some consolation he undoubtedly gained from his editorship of the National Institute's journal, *Occupational Psychology*, but it seems likely that in London as in Cambridge he suffered disappointment. Nevertheless, he made his outstanding mark, and it gave him satisfaction to know that most of the personnel selection procedures adopted by the Navy and Army in the second world war, in the initial selection and allocation of recruits, were based directly on those developed by the institute for civilian purposes. He was a cultured, generous, kindly affectioned man, proud of his Jewish race. It is fitting that his last production should have been a report on Attitudes in Minority Groups, prepared for the Society of Jews and Christians: it is a fine, scholarly work which reflects his deep insight into anthropology."

Myers published an *Introduction to Experimental Psychology* and other books mostly concerned with the industrial aspect of psychology, but his influence was exerted rather through his teaching and organising tha his writings. In later years he was honoured by sever universities, receiving, honoris causa, the D.SC. of Manchester in 1927, the LL.D of Calcutta in 1938, and th D.SC. at Pennsylvania in 1940. He lived to see th successful application of principles established thirt years ago by him and his colleagues.

He was married and had two sons and three daughter who, with his widow, attended a memorial service London on Oct. 16.

SYDNEY ARTHUR OWEN

M.D. CAMB., F.R.C.P.

Dr. Sydney Owen had been at heart a children doctor since the days when he served as resident medic officer at Shadwell, and though he did not drop his wor among adults his appointments showed where his rea interest lay. A pioneer in neonatal pædiatrics, he ha been physician to the Queen's Hospital for Childre Hackney, since 1910. Physician to the Princess Loui Hospital for Children from the time of its opening, he wa also on the staff of the City of London Maternity Hospita From 1912 to 1937 he was in charge of the pædiatr department of the West London Hospital, where he die on Oct. 14.

An exhibitioner of Trinity College, Cambridge, he too a first class in the natural sciences tripos in 1901. A University College Hospital, where he qualified in 190 taking his M.B. the following year, he was awarded a Atchison scholarship, a senior Fellowes medal, and medal for midwifery. In 1910 he took his M.D. Camb., an in 1928 he was elected F.R.C.P.

Among the pieces of apparatus which he introduce and carefully tested was the "oxygen bell," a devic for administering oxygen to small infants which is i regular use in hospitals. But it was characteristic o Sydney Owen that he himself never published anythin about its use. An excellent teacher, he would have fille admirably a full-time clinical and academic appointment

ROYAL COLLEGE OF SURGEONS OF ENGLAND

MONTHLY dinners to which fellows and members of the llege and members of the associations linked with the llege may bring guests have now been held for just over a ar, and the attendance has ranged from 40 to 100. The nners always take place at the college on a Wednesday, 7 P.M., and the following are the dates chosen for the ming session:

1946: Nov. 13, Dec. 11.
1947: Jan. 8, Feb. 12, March 12, April 9, May 7, June 11, July 9.

Applications for tickets, accompanied by a remittance of ne guinea a head, must reach the assistant secretary of the ollege, Lincoln's Inn Fields, London, W.C.2, at least one week efore the date of the dinner.

ADDITIONS TO POISONS LIST

BY regulations which came into force on Oct. 15, pethidine nd its salts, and dihydrodesoxymorphine are added to part I f the Poisons List, and zinc phosphide to part II. These ubstances are added to the first schedule of the Poisons Rules, but rat and mouse poisons containing zinc phosphide re exempted from first schedule requirements and may be ld by listed sellers of part II poisons.

niversity of Sheffield

Dr. D. H. Smyth has been appointed to the chair of physiogy, in the place of Prof. G. A. Clark, who has resigned to ake a post in the Ministry of Health.

Dr. Smyth, who is 38 years of age, graduated B.SC., with first-lass honours, at Belfast in 1929, and M.B. in 1932. After being house-surgeon at the Royal Victoria Hospital, he was, in 1933, ppointed senior demonstrator in physiology at Queen's University, where he worked under Prof. T. H. Milroy and Prof. Henry Barcroft. In 1934 he became a M.SC., and in 1935 M.D. With a Musgrave studentship he studied for a year under Prof. Hermann Rein at Göttingen, and on returning to this country in 1937 was appointed ecturer in physiology at University College, London. In 1939 Dr. Smyth went to Sheffield to which part of the London Faculty f Medical Sciences was evacuated, and in 1940 he helped to organise he department's work at Leatherhead; in 1944–45 he acted as ead of the department in the absence of Prof. Lovatt Evans, .R.S., on special war duties. In 1941 he gained the doctorate f philosophy of London University. Since 1943 he has been sub-ean and tutor to medical students at University College, and as made a special study of methods of selecting candidates for raining. This year he became senior lecturer in physiology. His ublications have dealt principally with respiration and metabolism.

As announced last week, Dr. R. S. Illingworth has been ppointed professor in charge of the new department of child ealth in the university.

Dr. Illingworth studied medicine at the University of Leeds, ualifying in 1934. He held resident medical posts at Leeds, and bstetrical and ear, nose, and throat posts at Huddersfield, and pent a period in general practice before appointment as resident nedical assistant and clinical pathologist at the Hospital for Sick hildren, Great Ormond Street. He graduated M.D. and became .R.C.P. in 1937, and in 1938 obtained the D.P.H., with distinction, and he D.C.H. In 1939 he won a Nuffield research studentship in medicine t the Radcliffe Infirmary, Oxford, and a Rockefeller research ellowship for travel in the United States. He was in the R.A.M.C. rom 1941 to 1946, serving, with the rank of lieut.-colonel, as fficer in charge of the medical division of military hospitals in the iddle East and Northern Ireland. He is at present assistant o the professor in the Institute of Child Health, London. Dr. llingworth has published papers on nephritis, prematurity, infectious iseases, and other subjects. He is a fellow of the Royal Photographic ociety.

niversity of Manchester

On Tuesday, Nov. 19, at 4.15 P.M., Prof. Michael Polanyi, .D., PH.D., F.R.S., will deliver the Lloyd Roberts lecture in he physiology theatre of the university. Professor Polanyi, ho holds the chair of physical chemistry at Manchester, will eak on the Foundations of Academic Freedom.

oyal College of Surgeons of England

On Oct. 15 Dr. Allen Oldfather Whipple, Valentine Mott rofessor of surgery at Columbia University, New York, was dmitted to the fellowship, honoris causa, and was afterwards ntertained to dinner by the council. In the course of his peech of presentation, Sir Heneage Ogilvie, senior vice-resident, described him as "a great American surgeon, a ioneer in surgical research, a moving spirit in surgical education, a brilliant operator, an inspiring writer, a well-loved eacher." He went on:

"We honour him, not for his many distinctions but for the ability hat earned those distinctions, not for the many important offices e holds or has held but for the outstanding qualities of mind and haracter that have earned him those appointments. Dr. Whipple's ame is printed large on every page of surgical advance, and where ther surgeons are breaking new ground and treading fearfully as hey are today in the surgery of malignant diseases of the pancreas, here they see Allen Whipple before them saying 'Here I am. This s the way I have gone, and where I have trodden, you may follow afely.'"

Royal College of Surgeons of Edinburgh

At the annual meeting of the college on Oct. 16 the following office-bearers were elected for the ensuing year: president, Mr. J. M. Graham; vice-president, Prof. R. W. Johnstone; secretary and treasurer, Mr. K. Paterson Brown; members of the president's council, Sir John Fraser, Dr. G. Ewart Martin, Mr. F. E. Jardine, Mr. W. Quarry Wood, Mr. Walter Mercer, and Prof. J. R. Learmonth: representative on the General Medical Council, Sir Henry Wade: convener of museum committee, Mr. W. Quarry Wood; and librarian, Dr. Douglas Guthrie.

The following were admitted fellows:

Nicholas Alders, M.D. Vienna, M.R.C.S.; C. J. B. Anderson, M.B. Aberd.; W. G. Birks, M.B. Adelaide; S. K. Burcher, M.B. N.Z.; A. G. S. Calder, M.B. Edin.; E. A. Chisholm, M.B. Glasg.; L. M. David, M.B. Witwatersrand; F. W. T. Davies, M.R.C.S.; A. J. Freese, M.R.C.S.; G. L. Gale, M.B. Birm.; M. P. Goradia, M.B. Bombay; J. B. M. Green, M.R.C.S.; F. M. Hanna, M.B. Dubl.; E. L. John, M.B. Lond.; W. G. Kerr, M.B. Edin.; J. E. Laing, M.B. Edin.; W. H. S. Liebenberg, M.D. Amsterdam; Tobias Levitt, M.R.C.S.; A. A. MacGibbon, M.B. Edin.; J. M. McInroy, M.B. St. And.; T. B. McMurray, M.B. Lpool; J. M. Matheson, M.B. Edin.; K. N. Mitra, M.B. Patna; R. F. O'Driscoll, M.B. N.U.I.; G. V. Osborne, M.B. Lpool; A. P. R. Pinto, M.B. Bombay; E. C. Richardson, L.R.C.P.E.; G. K. Riddoch, M.B. Camb.; L. J. Roy, M.B. N.Z.; A. R. Taylor, M.B. Aberd.; D. J. Waterston, M.B. Edin.; Austen Young, M.B. Edin.

Royal College of Physicians of Ireland

Dr. Bethel Solomons has been elected president of the college.

Royal College of Obstetricians and Gynæcologists

The following course of lectures on recent advances affecting obstetrical and gynæcological practice will be given in the college house at 5 P.M. on each day: Nov. 1, Prof. J. C. Moir, Application of Radiology to the Diagnosis of Cephalo-pelvic Disproportion; Nov. 15, Dr. J. M. H. Campbell, Heart in Pregnancy; Nov. 29, Dr. J. F. Loutit, Rhesus Factor; Dec. 13, Mr. Victor Bonney, Myomectomy; and Jan. 10, Mr. F. J. Folley, D.SC., Lactation. Admission is by ticket only, for which early application should be made to the secretary.

Leeds and West Riding Medico-Chirurgical Society

Forthcoming lectures to this society include: Nov. 1, Prof. H. V. Dicks, Rôle of the Family Doctor in Mental Hygiene; Nov. 22, Dr. Macdonald Critchley on Sir William Gowers; Feb. 14, Dr. Peter Bishop. Use of Sex Hormones in Medicine; March 8, Prof. C. F. W. Illingworth, Recent Observations on Peptic Ulcer.

Association of Plastic Surgeons

A meeting of those interested in the establishment of an association of plastic surgeons will be held at the Royal College of Surgeons, Lincoln's Inn Fields, W.C.2, on Wednesday, Nov. 20, at 5 P.M. The President of the Royal College of Surgeons, welcoming the formation of such a body, has suggested that it should fall into line with similar associations already affiliated to the college.

Gifts from South Africa

General Smuts, prime minister of South Africa, on Oct. 18 handed to Mr. Attlee a bank draft for £196,000 as an offering to the people of Great Britain from the people of Durban and the province of Natal. Attached to the gift was a condition that the money should be spent on a hospital or similar utilitarian memorial. At the same time General Smuts presented a gold certificate for £985,000 as a nation-wide offering from all the people of South Africa and the British protectorates "to be used for the advantage of the British people."

Empire Rheumatism Council

Today, Friday, Oct. 25, Dr. C. W. Buckley will take the chair at a dinner, to be held at the Euston Hotel, London, N.W.1, at 7.15 P.M., to welcome the official Swedish delegates to the celebrations of the tenth anniversary of the foundation of the council. On Oct. 26, at 11, Chandos Street, W.1, at 11 A.M., Prof. J. A. Höjer, chief medical officer of the Royal Swedish health department, will give an address on Organisation of Treatment and Research into Rheumatism in Sweden. Lord Horder will be in the chair, supported by Mr. M. G. B. Prytz, the Swedish minister. On Monday, Oct. 28, at 4 P.M., Mr. Aneurin Bevan, the Minister of Health, will be present at a reception to be held at the Apothecaries' Hall, Black Friars Lane, E.C.4. On Oct. 29, H.M. Government will give a lunch at the Savoy Hotel at 1.15 P.M., when Mr. Bevan presides; and at 5.30 P.M., the British Council are to hold a reception at 74, Brook Street, W.1.

Notes and News

LIVERPOOL MEDICAL INSTITUTION

AT a large gathering of members of this institution, held last Saturday, with Dr. G. F. RAWDON SMITH, the president, in the chair, the honorary membership was conferred on Dr. A. E. Barclay, Sir Allen Daley, Dame Louise McIlroy, Prof. Charles McNeil, Dr. Ivan Magill, and Sir Alfred Webb-Johnson. The following are extracts from the introductory speeches delivered by Dr. ROBERT COOPE as orator:

DR. ALFRED ERNEST BARCLAY

In medicine's house there are many mansions. Alfred Ernest Barclay is one of the pioneers who has helped to build its well-fitted darkroom, in which men can usefully pursue "shadows, not substantial things." He has given us the work of a master in his book on the radiology of the digestive tract. With rare ingenuity he divides light from darkness, and emerges from obscurity to explain the mechanism of swallowing or to reveal the mysteries of the fœtal circulation, or to startle us with a new and revolutionary tale of the blood-flow through the kidneys. Thus he looks upon the forms of things unknown, turns them to shapes, and gives to airy nothing a local habitation.

To craftsmanship he adds a scholar's integrity. . . . As Socrates felt about words, so he feels about X-ray shadows: to use them in an improper sense is not only a bad thing in itself, but it also generates a bad habit in the soul.

SIR ALLEN DALEY

William Allen Daley—one of our own sons, a former councillor of this institution—has wandered into a far country, but today he comes back to us, full of honour and achievement.

There is no problem of preventive medicine on which the Government of the day does not turn to him for counsel. He sits almost by natural right on committees and commissions which consider matters of medical administration, education, or policy. Since 1939 he has directed the health services of the County of London—that awkward, more than ever ungainly Great Wen. But London has no terrors for this Merseysider. The man who was brought up in Bootle, who married a native of Liverpool, whose children were born in our midst, who thrived on the smoke and noise of Brownlow Hill, and who was tempered in the keen air of a provincial medical society could take London in his stride.

Throughout the war years, when London endured the long-drawn-out sufferings of bombs and fire and flying bombs and rockets, he virtually never left his post, day or night. The calm and sustained devotion to duty of this modest and homely man steadied and inspired his team. We welcome him home with pride.

DAME LOUISE MCILROY

"England," wrote Bernard Shaw, "cannot do without its Irish and its Scots, because it cannot do without at least a little sanity." Anne Louise McIlroy made doubly sure that we should need her, first by being born in Antrim, and then by taking her medical course in Glasgow. It wanted only the finishing touch of Dublin to make her irresistible when the Royal Free Hospital looked for a professor of midwifery.

She might sweep through her ward like a whirlwind: might on occasion drive her staff almost to distraction by an inexorable insistence on detail: might never hesitate to say, forcibly and without respect of persons, what was in her mind; but however wild an Irishman may be, he has one eye always on things as they are. To many problems in her chosen field she brought abounding enthusiasm, but her final answers had the simplicity of hard common sense. Her old students have found that she has fixed enduringly in their minds fundamental principles. She has even dared to preach that the right place for a baby is with the mother. . . .

Now in the ripeness of her days, she can look back upon old, forgotten, far-off battles, and be satisfied: for by what she has done and by what she is, she has helped to make it natural for women to take their place in our profession.

PROF. CHARLES MCNEIL

Early in his medical career Charles McNeil was hard-headed enough to realise that much may be made of a Scotsman if he be caught young. Certainly a lifetime's experience of techy and wayward infancies has made him a canny clinician and a very wise man, a senator among pædiatricians: nor has it taken the edge off a dry and palatable humour.

He has thrown light on many aspects of disease in children, notably on the respiratory infections of childhood; but as professor of child health he *more than most men has given to pædiatrics* a positive social content, championing the cause of the newborn baby, pleading earnestly for prophylactic child-care. To him this is no affair merely of instruction at medical clinics. He wants a practical and practisable gospel of child welfare carried right into the homes of the people.

We hope that it may be long before he needs an epitaph. When the time comes, however, he will have well earned that which was once given to another great man: "When he died, the little children cried in the streets."

DR. IVAN MAGILL

Ivan Whiteside Magill came across the water from Northern Ireland bringing with him a rich brogue and a spirit eager to blaze new trails. For a brief moment he broke his journey at our own Stanley Hospital to familiarise himself with a special brand of catarrhal upper respiratory tract; but he passed on to the metropolis, where he now puts even the most uneasy of crowned heads to sleep.

Modern anæsthesia owes him much, for he has improved its techniques and helped to make it safe. Without his skill and guidance the thoracic surgeon especially might still be unable to move delicately and with little hazard in a difficult field. Today the patient condemned to a chest operation is not even allowed to breathe; his respiratory centre is first poisoned and then ignored, and with rubber bag and strong right hand the anæsthetist breathes for him. Moreover, Magill has seen to it, by the provision of ingenious tubes, that the anæsthetising vapours are carried to the innermost shrine of his being.

SIR ALFRED WEBB-JOHNSON

The glory of a surgeon is a thing of a moment: he lives so long as he is alive. The quick and ready motion of st hands with experience creates his signature, which no man copy; and though it may be read on the bodies of his p they too are mortal.

Some surgeons live on in their students, lighting a cand their minds and hearts which can never be put out. Some numbered among the few who in various ways help to push fo the advancing edge of their subject. Some are remembered their leadership in wider issues of medicine and of medical p

Alfred Webb-Johnson qualifies on all three counts. W Manchester trained one day, London received a little breathle on the morrow. A born teacher, he never forgets a studen houseman, a theatre sister, a nurse who has been one of his te he even knoweth his sheep by name. Medical education a research have profited by the magic of this modern alchemist w has solved the mystery of distilling gold from baser metal. A now he is one of our most trusted medical statesmen, a man for t times, clear headed, robust in common sense, imperturbable.

After the new honorary members had been formal admitted by the president, each expressed appreciation and thanks to the members. In the evening the honorar members, together with the Lord Mayor of Liverpool and other official guests, were entertained to dinner at the Exchange Hotel.

COUNCIL FOR THE CARE OF SPASTICS

THE founding of St. Margaret's School at Croydon[1] ha marked an entirely new phase in the care of children with cerebral palsy in this country. Their special needs are now recognised, and for some time various people and bodies interested in their care have felt that a council should be formed on a national basis to provide treatment and education for them. On Oct. 17 a meeting was held at the London School of Hygiene and Tropical Medicine, with Mr. G. R. Girdlestone, F.R.C.S., in the chair, to consider how such a council might best be founded. Both the Central Council for the Care of Cripples and the British Orthopædic Association, he said, have been studying the needs of these children. The Ministries of Health and of Education have included them in their plans in a general way, but there is much more to be done, he feels, in exact diagnosis of the damage done to the brain, and in the study of the psychological needs of spastic children. About a twentieth of them are deaf or have defective hearing. The exact numbers in the country have yet to be ascertained, but there are said to be about 7 children born with cerebral palsy in every 100,000 live births; 1 of these will die during infancy and 2 of the remaining 6 will be seriously defective mentally and thus fall outside the group for which the proposed council is to care. Each child needs the attention of an orthopædic surgeon, and Mr. Girdlestone estimated that there should be one physiotherapist and one occupational therapist for every 15, and a speech therapist for every 30 children. The parents need training in the care of their children; at St. Margaret's the mother is is to spend a day at the school once a week, helping to look after both her own child and others. The council, Mr. Girdlestone suggested, must help to develop training institutions, including residential and day schools, vocational training centres, and perhaps sheltered factories. In Danish hospitals, it seems, 30% of the secretarial staff are cases of cerebral palsy, a plan which does well, he said, as long as those they have to work with remain calm and serene. Since the only way to convince people that a thing needs doing is to do it, he suggested that the council, when formed, should select a small energetic committee to get the work going. A discussion on the name of the council followed, in which it was agreed that the work should not be limited to children, and that an appropriate name would be "Council for the Care of Spastics (and those with allied conditions)."

Prof. J. M. Mackintosh was anxious to see the council formed forthwith, but since many of those present were unknown to each other it was finally agreed that the meeting should constitute itself an Association for the Care of Spastics (and persons suffering from kindred conditions), and should appoint a committee to draw up recommendations for the creation of a council. This committee, it was agreed, should have power to receive and expend money until they reported to the association in six or eight weeks' time, and their running expenses for that period, up to £400, were guaranteed by Mr. Paul Cadbury.

Members of the committee are: Mr. Stephen K. Quay (chairman); Mr. H. P. Weston, M.A. (secretary); Mr. E. S Evans, F.R.C.S.; Miss M. I. Dunsdon, M.A.; Mrs. W. Lionel Hitchens; and Mr. N. D. Bosworth Smith, M.A.

---

[1] See *Lancet*, Sept. 7, 1946, p. 351.

INFLUENZA B IN 1945-46

J. A. DUDGEON
M.C., M.B. Camb.*

C. H. STUART-HARRIS
M.D. Lond., F.R.C.P.

R. E. GLOVER
F.R.C.V.S.

C. H. ANDREWES
D. Lond., F.R.C.P., F.R.S.

W. H. BRADLEY
D.M. Oxfd

From the National Institute for Medical Research, London

THE possibility of a widespread influenza epidemic in e winter 1945–46 was a serious problem to public-alth authorities in this country and on the Continent, d there was the more remote prospect of a pandemic ch as broke out in 1918–19. Conferences were therefore ld in 1945 under the auspices of the Medical Research ouncil to discuss methods of control of an epidemic, ould one develop.

It was thought important that any increase in the cidence of upper respiratory infection should be etected as early as possible, and that every attempt ould be made to isolate and identify any influenza irus in order to compare its antigenicity with known trains. A careful watch on the weekly influenzal deaths n the 126 great towns of England and Wales and the nortality in the younger age-groups would give addi-ional information about the trend of the epidemic.

A circular letter from the Ministry of Health (E.M.S.I. 526) was sent to many hospitals and medical officers of this country asking them to report any increase in upper respiratory infection and in influenza, and to submit samples of serum for serological test and garglings for virus isolation. The conditions in Western Europe, particularly the shortage of food and fuel, together with the continually shifting population of displaced persons, made the spread of communicable disease a very real threat there, and all medical officers in the army of occupation and civil administration were therefore asked to coöperate in this "spotting system" by reporting the number of cases of influenza in their areas.

An epidemic did break out and was proved both serologically and by direct virus isolation to be largely due to the B virus. The first indication of influenza came in late December, 1945, from military hospitals in Brussels and Antwerp; virus B was identified serologically in several cases. Despite this and mild local epidemics in a few units of the British Army of the Rhine (B.A.O.R.), there was no general epidemic in Germany. A most careful watch for cases of influenza was kept in the U.S. zone by the medical services of the U.S. Army; and, though sporadic cases, proved to be influenza A or B, were encountered among U.S. troops, no epidemic developed either in them or in civilians.† Some displaced persons' camps, which were under special observation, did not have epidemics, though sporadic cases of influenza A and B were encountered.

INFLUENZA OUTBREAK IN GREAT BRITAIN

The deaths from influenza reported weekly from the 126 great towns of England and Wales began to increase in the second week of December and rose in irregular fashion to a peak in the last week of January and first week in February, after which a slow decline began (table I). However, the increase in deaths was not uniform all over the country, and some areas, including East Anglia and the West Country, did not register any considerable increase. By comparison with other recent epidemics, that of 1946 was moderately severe; but actual outbreaks or epidemics among either the population or in semi-closed communities were not encountered except in the instances detailed below. Practitioners of the East Midlands, who were circularised by the Ministry of Health, recorded outbreaks in some areas but not in others. Absenteeism from the industrial areas was not regarded as unusually high.

The chief evidence which supported the statistical record of an epidemic was the reception of numbers of sera, usually from 2–5 individuals from each of numerous hospitals, from cases in patients or staff regarded as typical of influenza. The rate of reception of specimens in the various weeks rose to a peak which coincided in time with the statistical record of deaths (see figure). Notified influenza morbidity in the Army at home, though of low total incidence, also showed a rise which coincided in time with the deaths and the numbers of specimens. Similar notifications for the B.A.O.R. did not show this rise as compared with figures for December, 1945.

Epidemics encountered during this time included several sharp outbreaks at public schools and preparatory boarding-schools in the south of England. These schools reassembled about Jan. 17 and had an incidence of 20–50% of cases of influenza within the next three weeks. A small outbreak at a tuberculosis convalescent home at Harrow began on Jan. 17. An "epidemic in miniature" occurred from Jan. 25 to Feb. 9 in two companies of Army recruits at Colchester among units of infantry training centres assembled on Jan. 18. Two outbreaks of influenza in the R.A.F. among West Indian troops (see below) occurred in the early days of January and at the end of that month. The striking feature of the Service outbreaks was their localisation to a certain type of population and failure to spread to neighbouring companies or units. The absenteeism from the very large number of workers at Woolwich Arsenal reached a maximum in the third week of January. In general therefore the outbreak occurred in Great Britain in January and early February, with a peak in the week ending Feb. 2.

SEROLOGICAL INVESTIGATIONS

From late December to the end of April, 1946, 351 pairs of sera from the United Kingdom and British

TABLE I—COURSE OF INFLUENZA-B OUTBREAK 1945–46

Week ending	Deaths in Great Britain		No. of specimens	Influenza notifications per 100,000	
	England and Wales	Scotland		Army U.K.	B.A.O.R.
Dec 1, 1945	30	1	..	13·7	2·8
„ 8, „	35	1	..	14·2	6·4
„ 15, „	69	1	..	21·3	2·7
„ 22, „	76	4	10	27·2	5·4
„ 29, „	72	5	10	18·1	4 2
Jan. 5, 1946	123	17	9	28·1	2 2
„ 12, „	165	21	14	49 9	2·5
„ 19, „	174	30	24	61·2	3·5
*Jan. 26, 1946	273	43	37	78·0	1·0
*Feb. 2, „	297	40	44	95·9	3·4
„ 9, „	304	36	67	76·5	3·9
Feb. 16, 1946	220	22	25	57·1	2·4
„ 23, „	141	13	22	42·6	0·5
Mar. 2, „	123	12	19	36·9	20·5 for 5 weeks
„ 9, „	112	7	2	43·8	
„ 16 „	93	5	10	41·9	
„ 23, „	77	7	..	34·9	
„ 30, „	50	6	..	23 9	

* Weeks when most of the inoculations with influenza vaccine were effected.

---

* Seconded from R.A.M.C. between November, 1945, and March, 1946.

† We are indebted to Major S. Bowditch, U.S.A.M.C., for this information.

Medical Research Society

A lecture on the Artificial Kidney will be given by Dr. W. J. Kolff at University College Hospital medical school on Thursday, Nov. 7, at 5 P.M. Those interested are invited to attend.

Radiotherapy in Uterine Cancer

A joint meeting of the British Institute of Radiology, the Faculty of Radiologists, and the radiological section of the Royal Society of Medicine will be held today, Friday, Oct. 25, at 5 P.M., at the institute's house, 32, Welbeck Street, W., to hear Prof. J. Heyman (Stockholm) speak on Radiotherapy of Cancer of the Corpus Uteri.

Professional Nurses and Midwives Conference

At the opening of the conference in London last Monday, Colonel Walter Elliot, F.R.C.P., F.R.S., the deputy president, traced the history of British nursing since it had broken with the European tradition of association with religious foundations. Florence Nightingale, he said, though she achieved the miracle of a ready-made tradition, was herself a rebel. Even before the start of the late war there had been too few nurses; he blamed overwork and underpay, and the deadening effect of tradition. Registered nurses now numbered 138,000, and it was estimated that a further 30,000 nurses were required—*i.e., three years' intake without allowing for the 50% wastage.* Better conditions were needed, with a modernisation of the tradition, but the nurse's authority must be retained; the nursing profession must, above all, preserve its charity and discipline.

London Hospital Dinner

Presiding over the annual dinner on Oct. 17, Sir Henry Bashford pointed out that in the nine years since it was last held a whole generation of students had entered the hospital, qualified, held house-appointments, and gone its way. These years had seen the death of many members and former members of the staff—Mansell Moullin, Hurry Fenwick, Wilfred Hadley, Percy Kidd, Henry Head, Lord Dawson, Hugh Rigby, L. A. Smith, H. R. Andrews, Lambert Lack, E. W. Clapham, James Sherren, William Bulloch, Charles Miller, Russell Howard, S. G. Scott, F. F. Muecke, Charles Lindsay, Jack Harris, and Tudor Edwards—and of Sir William Goschen, the chairman. Of the many retirements he mentioned only two—those of Prof. Arthur Ellis to the regius chair of medicine at Oxford, and of Mr. E. J. Burdon, whom he had supposed to be part of the fabric but who had in fact been secretary to the medical school for only 37 years and was still young enough to embark on some entirely new occupation such as farming or holy orders. During the war 1206 Londoners (including nurses and lay staff) served in the Forces, winning 73 decorations and 83 mentions in despatches. Consultants in the three Services included Robert Milne, Alun Rowlands, Henry Tidy, James Walton, Hugh Cairns, J. R. Rees, George Riddoch, Ashley Daly, Charles Donald, Arthur Lister, R. R. Bomford, and W. J. O'Donovan. Baronetcies had been conferred on Robert Hutchison and Hugh Lett, who were simultaneously president of the Royal Colleges of Physicians and Surgeons. Dr. Dorothy Russell and Dr. Clifford Wilson were now professors, and the appointments to the hospital staff included those of Sir Reginald Watson-Jones, Mr. Osmond Clarke, Mr. Vaughan Jackson, Dr. Frank Ellis, Dr. Lloyd Rusby, Dr. Kenneth Perry, Mr. Vernon Thompson, Dr. Henry Wilson, and Mr. A. Bowen-Davies: the London had never believed in the closed shop. There were new departments for X-ray therapy, psychiatry, and the treatment of accidents: thanks to rehabilitation "a man coming in with a fractured femur can be discharged a fortnight later as a fully trained organ-grinder." Rebuilding plans would cost £3 million, and £100,000 was already being spent on repairs to the hospital, which had had eight direct hits. With 620 beds in use in London and 320 in the annexe at Brentwood, it was still (as throughout the war) the largest voluntary hospital in Britain.

In the medical school, said Sir Henry, women would appear in October, 1947; and he welcomed among the guests Colonel C. R. M. Green, I.M.S. retd., who became a student there in 1879 and had now entered his grand-daughter. To those still having trouble with examinations he offered the comfort of long experience: "either you go on and on and on—or you don't. And as one looks at time from the other end, how little it seems to matter." Looking at the men the hospital had produced he could not feel too pessimistic about the future of medicine. After all, in the golden age of Mead, Arbuthnot, Radcliffe, and Hans Sloane, physicians considerable part of their income by selling remedies composition they often kept secret; and a hundred hence some of the customs of our own time might equal thought inappropriate. Medicine itself, as art and went too deep to be ever chained or bridled by enthusiasts of whatever persuasion. The same was the London Hospital, which represented something too and too sane ever to disappear. In the future as in the each new generation coming within its influence would its tradition.

Dr. J. H. Thomas, proposing The Chairman, quoted of his early poetry. While disputing a statement in one of his less good books Dr. Thomas felt bound commend his steadfastness and his humanity.

Diary of the Week

OCT. 27 TO NOV. 2

Monday, 28th

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene, Keppel Street, W.C.1.) Major Greenwood, F.R.S.: British Pioneers in Medicine from Percival to Simon. (Heath Clark lecture
ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn W.C.2
3.30 P.M. Prof. Alexander Lipschutz: Tumorigenic Action Steroids and its Implication for the Problem of Cance
5 P.M. Mr. R. J. McNeill Love: Surgery of the Gall-bladder an Common Bile-duct.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
3 P.M. Field Marshal Montgomery: Morale—with Partic Reference to the British Soldier. (Lloyd Roberts lecture.)
5.30 P.M. *Odontology.* Prof. H. Stobie: Rôle of Dentistry Medicine. (Presidential address.)
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Mr. Norman Dott, Sir Charles Symonds: Symp tology and Treatment of Intervertebral Disks.

Tuesday, 29th

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene.) Prof. M. Greenw British Pioneers in Social Medicine.
ROYAL COLLEGE OF SURGEONS OF ENGLAND
3.30 P.M. Prof. Alexander Lipschutz: Antitumorigenic Act of Steroids.
5 P.M. Mr. G. A. G. Mitchell: Value of Penicillin in Surgery.
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Sir Archibald Gray: Sarcoidosis.
EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Dr. A. C. P. Campbell: Cellu Defence.

Wednesday, 30th

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene.) Prof. M. Greenwo British Pioneers in Social Medicine.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portl Place, W.1
3.30 P.M. Dr. W. H. Bradley: Methods Adopted in the Detect of the Carrier.

Thursday, 31st

UNIVERSITY OF LONDON
5 P.M. (University College, Gower Street, W.C.1.) Sir Jos Barcroft, F.R.S.: Movements of the Human Fœtus.
5.30 P.M. (London School of Hygiene.) Prof. M. Greenwo British Pioneers in Social Medicine.
ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Prof. Geoffrey Jefferson: Surgery of Intracra Aneurysms.
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. J. L. Franklin: Lichen Planus and Lichen Eruptions.

Friday, 1st

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene.) Prof. M. Greenwo British Pioneers in Social Medicine.
ROYAL COLLEGE OF SURGEONS OF ENGLAND
3.30 P.M. Prof. Alexander Lipschutz: Steroid Balance and Antitumoral Autodefence.
5 P.M. Prof. C. A. Pannett: Pancreatic Surgery.
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Q Anne Street, W.1
5 P.M. Prof. J. C. Moir: Application of Radiology to the Diagnos of Cephalo-pelvic Disproportion.
ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Mr. H. V. Forster: Otology in School children and Child Welfare. (Presidential address.) Cas at 10 A.M.
2.30 P.M. *Laryngology.* Mr. Norman Patterson: Reminiscence and Reflections. (Presidential address.) Mr. Lionel Colledge: Laryngectomy. (*Film.*)
8.15 P.M. *Anæsthetics.* Dr. E. S. Rowbotham: Hundred Years of Anæsthesia. (Presidential address.)
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. S. Roodhouse Gloyne: Industrial Diseases of th Lung.
LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY
8.30 P.M. Prof. H. V. Dicks: Rôle of the Family Doctor in Menta Hygiene.

Saturday, 2nd

BIOCHEMICAL SOCIETY
11.15 A.M. (London School of Hygiene.) Discussion: Quantitative Biochemical Analysis by Microbiological Response.

noted on the second amniotic passage but was not present on the third; these were classed as negative (see table III). The first 2 cases in which virus was isolated occurred in January, one from a patient in Germany, the other from a nurse in Surrey with a severe form of influenzal pneumonia. Specimens of amniotic fluid (second amniotic passage) were tested against specific A and B ferret antisera. The virus was inhibited by B (Lee) serum but not by A serum; the current virus was therefore a B virus.

Until the first isolation in January 18 garglings had been tested with negative results. After this, more successful results were obtained, and this increase in the number of cases in which virus was isolated coincided with the increase in the recorded number of deaths from influenza. Though several of the earlier garglings were taken from patients who were later shown serologically to have had influenza, it was impossible to isolate the virus from these garglings, and repeated attempts to isolate the virus from material stored at −76° C failed. A possible explanation is that the virus underwent some change during human passage which made its isolation easier.

All strains isolated were readily adapted to growth in the allantoic sac. Using third amniotic passage material, 0·1 c.cm. was inoculated into the allantoic cavity of 10-day chick embryos. The fluid was harvested after 48 hours and its agglutinating titre tested by Hirst's method. The twelve positive strains were regarded as distinct until they had been compared antigenically one with another and with other known strains. Owing to the number involved it was impossible to proceed with them all.

TABLE IV—ANALYSIS OF FERRET SERA AFTER INOCULATION WITH INFECTED ALLANTOIC FLUID (TITRE 128)

Specific antigen	Specific ferret antiserum				
	LEE	CRA	LEI	CLE	CLA
LEE ..	512	64	32	32	32
CRA ..	64	2048	1024	2048	2048
LEI ..	32	2048	2048	2048	2048
CLE ..	64	1024	1024	2048	2048

ANTIGENIC COMPARISON

An early attempt was made to compare the current strains with previously isolated B strains, the standard B (Lee) strain and the Paddington strain. Two recent strains, Eliz B and Mil B from an epidemic in Melbourne in 1945, were sent to England by air by the kindness of Dr. F. M. Burnet.

Specimens of allantoic fluid from each of the five strains—Lee, 4 current strains, Paddington, Eliz B, and Mil B—were inoculated into ferrets for the production of specific ferret antiserum. Owing to the difficulty experienced in adapting the current strains to mouse lung (see below), the only attempt at antigenic comparison was by Hirst's test. Table IV shows the comparison between the Lee and four of the current strains, CRA, LEI, CLE, CLA. These four appeared to be distinct from Lee but to be themselves closely related. There was no relation to the A virus. Table V shows a further analysis of several different B strains with their respective ferret antisera. It can be seen that the Lee and the remainder, except possibly the Paddington, are distinct; there appears to be a fairly close connexion between the CRA, Eliz B, and Mil B, though there are possibly some small antigenic differences in the remainder of the subgroup. There is some tendency, also noted by Francis et al. (1946) in the case of rabbit sera, for freshly isolated B strains to be very susceptible to agglutinin inhibition by heterologous and even normal sera.

In view of the differences between Lee and 1946 strains, human sera showing no antibody rise against Lee were retested against the CRA strain. For example, of 10 sera tested from a small epidemic at a school in Dorset, 5 were positive to B (Lee) and 5 negative to A and B. When these sera were retested with the current strain (CRA), 2 of the negative sera proved to be positive, and the rise in antibody in those previously positive was greater with the CRA virus than with the Lee. Sera from several other sources which showed less than a fourfold rise in antibody to the Lee virus were then retested with the Lee and CRA strains. Of 103 pairs of sera so tested, 55 showed no rise in antibody with either strain, 25 a twofold rise with both, 17 a twofold rise with CRA only, and 6 a fourfold rise with CRA without any corresponding rise with the Lee. A further 53 pairs of positive sera were tested with both strains: 29 showed a fourfold rise with both, 14 a fourfold rise with Lee and eightfold or greater with CRA, and 10 a sixteenfold rise with Lee and only a fourfold rise with CRA.

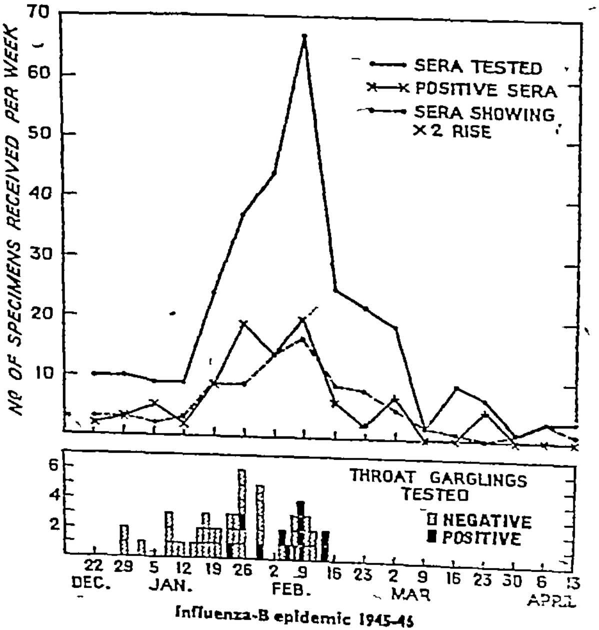
TABLE V—FURTHER ANALYSIS OF FERRET SERA

Specific antigen	Specific ferret antiserum					
	LEE	CRA	Eliz B	Mil B	Paddington	P.R.8
LEE ..	2048	64	64	64	256	8
CRA ..	256	1024	256	256	256	16
Eliz B ..	256	256+	512	512	512	8
Mil B ..	256	256	256	512	512	8
Paddington	1024	64	256	256	2048	16
P.R.8 ..	16	8	8	8	8	4096

A group of 24 persons was vaccinated with influenza-virus vaccine containing both A (P.R.8) and B (Lee) viruses through the coöperation of the medical superintendent, Darenth Park, Dartford, Kent. Serum samples were taken before and after vaccination and were tested for antibody rise by Hirst's method. The results showed an equal rise in B antibody to both Lee and CRA viruses. Such a result is encouraging, since it indicates that current vaccines, in which Lee virus is used, are likely to be as effective in protection against other strains of B as against the Lee virus.

INOCULATION OF FERRETS

Between November, 1945, and March, 1946, garglings from 45 patients and suspensions of lung from 2 fatal



Influenza-B epidemic 1945-46

Army in Europe were examined at the National Institute for Medical Research. Serum samples were received from all Service Commands, from public-health departments of the Allied Military Government, and from hospitals and practitioners throughout the United Kingdom. The figure shows the average weekly number of pairs of sera received and indicates the trend of the epidemic.

TABLE II—ANALYSIS OF SERUM SAMPLES RECEIVED AT M.R.C.

Pairs tested in the U.K. and B.A.O.R.	Virus A					Virus B				
	Negative		Positive			Negative		Positive		
	Rise in antibody					Rise in antibody				
351	0	×2	×4	×8	×16	0	×2	×4	×8	×16
	229	104	10	7	1	135	102	40	48	26
Total	333		18			237		114		

The method used in the agglutinin-inhibition tests was that described by Hirst (1942). The following standard conditions were observed.

Both specimens of serum were tested together on the same day with the same batch of antigen and with the same batch of fowl red cells (cf. Stuart-Harris 1943).

Reconstituted dried allantoic fluid, received from the Rockefeller Foundation in 1943 and containing A (P.R.8) and B (Lee) strains, was used as antigen.

Standard immune serum against A and B virus was tested with these antigens at regular intervals as a check on the results.

Fowl red cells were obtained from Plymouth Rocks and pooled before use.

A fourfold rise or greater was taken as a positive result.

The results of testing 351 pairs of sera are shown in table II. The serological tests clearly indicate that most infections were caused by the B virus, though some cases of A-virus infection were encountered. The most striking fact that emerges from these figures is the large number of sera that showed no rise or only a twofold rise in antibody. Many such cases occurred in closed communities, in hospitals and factories in which virus-B infection was known to be present; for example, in one London hospital, among 5 nurses whose sera were tested, 2 proved to be positive for B, 1 showed a twofold rise to B, and 2 were negative to A and B. We also encountered, as have other observers, cases from which virus B was recovered but yet no specific serological response to that virus developed during the disease. Reference is made below to tests against different serological strains of B.

In several instances sera showed a rise in both A and B antibodies. A small epidemic occurred at a tuberculosis convalescent centre in Middlesex (Grim's Dyke) in January; 3 of the cases showed a sharp rise of antibody: ×4 (A), ×8 (B); ×2 (A), ×4 (B); and ×4 (A) and ×8 (B). Several other such cases were encountered during the epidemic, but their explanation is obscure. Henle et al. (1946) have even encountered cases of experimental infection with virus A showing a serological response against B only.

Two instances of selective incidence were observed. At a R.A.F. station in Berkshire an epidemic occurred in late December and was entirely confined to the coloured West Indian population of the station, though both the coloured and white populations worked in close association. Serum analysis showed this to be a virus-B infection. A month later a further epidemic occurred among the West Indians, this time a virus-A infection. A case of virus-A infection was also identified among the white population. Further details are given in an accompanying paper (Jackson 1946).

About the same time a sudden small but sh epidemic was reported among coloured West Ind at another R.A.F. station in the Midlands. This prov to be due to the A virus and coincided with the seco wave at the other station.

VIRUS ISOLATION: ADAPTATION TO EGGS

Throat garglings from typical cases of influenza collected and inoculated into ferrets and develop chick embryos. Such specimens were collected as f as possible under standard conditions by the followi method.

The patient was asked to gargle 15 c.cm. of normal sali and to spit into a sterile bottle containing 5 c.cm. of hors serum broth. The specimen was kept cold, usually at −76° until used. The specimens from the Continent were collected and dispatched by air in a large 'Thermos' flask, unde the personal supervision of Lieut.-Colonel F. E. Buckland, R.A.M.C., of the medical directorate, B.A.O.R. The majority arrived at the National Institute in a satisfactory condition for examination. As far as possible, serum specimens f Hirst tests were obtained from all cases as a check on th presence of specific influenzal infection.

The method used for virus isolation was that describe by Beveridge and Burnet (1946). Garglings were not filtere but were inoculated directly into the amniotic cavity 13-day chick embryos in the presence of penicillin and sodium sulphadiazine. Each egg before inoculation received 0·1 c.cm of 5% sodium sulphadiazine. Sufficient penicillin to produc a final concentration of 125 units/c.cm. was mixed with th garglings before inoculation. These proved to be satisfactory bacteriostatic agents in most cases. Eggs were incubated at 37° C before and 35° C after inoculation. All inoculated embryos were incubated for a further 72 hours, after which all surviving eggs were placed in the ice-box for 2 hours before harvesting. The amniotic fluid from each egg was withdrawn into sterile tubes and tested with fowl and guineapig red cells for the presence of agglutination.

It was thought, in view of Burnet's work on the charac teristics of recently isolated A strains (Burnet and Bul 1943), that a new virus in its first amniotic passage (O-phase would agglutinate guineapig red cells to a higher titre than would fowl red cells. When later the current virus was isolated it was found to agglutinate the cells of both species to an equal titre, and the practice of using only fowl cells wa followed. Burnet *et al.* (1946) also found no evidence of a O-phase in the B strains they isolated.

All amniotic fluids were tested for sterility; those sterile after 24 hours were passed to a further group of six egg Each specimen was taken through three amniotic passes if negative at the end of this, passage was discontinued, but th gargling was retained at −76° C for further examination late

In all, 54 different garglings were tested, and viru was isolated in 12 cases. In 3 cases agglutination wa

TABLE III—ANALYSIS OF VIRUS ISOLATION IN CHICK EMBRY

No.	Date in 1946	Place	No. of amniotic passages			Subsequent allantoic inoc.	Rise in human antibody	Result of ferret inoc	
			1	2	3			Pyrexia	Ant bod
1	Jan.	*Bergkirchen	−	+++	+++	+++	×8 (+)	−	+
2	Jan.	London	−	++	+++	+++	×16 (+)	−	−
3	Jan.	Surrey	−	+++	+++	+++	×2 (−)	−	+
4	Feb.	Notts	−	++	+++	+++	NT	−	+
5	Feb.	Herts	−	++	+++	+++	×2 (−)	NT	NT
6	Feb.	Herts	−	++	+++	+++	×4 (+)	−	−
7	Feb.	London	−	±	++	+++	NT	−	+
8	Feb.	Herts	−	+	++	NT	×16 (+)	−	−
9	Feb.	London	−	++	+++	+++	NT	−	−
10	Feb.	Dorset	−	±	++	NT	NT	NT	NT
11	Feb.	Dorset	−	±	++	NT	NT	NT	NT
12	Feb.	London	−	−	+	NT	×4 (+)	−	−

* B.A.O.R. NT, not tested.

ted on the second amniotic passage but was not present n the third; these were classed as negative (see ble III). The first 2 cases in which virus was isolated ccurred in January, one from a patient in Germany, ne other from a nurse in Surrey with a severe form of nfluenzal pneumonia. Specimens of amniotic fluid econd amniotic passage) were tested against specific and B ferret antisera. The virus was inhibited by (Lee) serum but not by A serum; the current virus as therefore a B virus.

Until the first isolation in January 18 garglings had een tested with negative results. After this, more uccessful results were obtained, and this increase in he number of cases in which virus was isolated coincided ith the increase in the recorded number of deaths from nfluenza. Though several of the earlier garglings were aken from patients who were later shown serologically o have had influenza, it was impossible to isolate the irus from these garglings, and repeated attempts to isolate he virus from material stored at —76° C failed. A possible xplanation is that the virus underwent some change uring human passage which made its isolation easier.

All strains isolated were readily adapted to growth in he allantoic sac. Using third amniotic passage material, ·1 c.cm. was inoculated into the allantoic cavity of 10-day hick embryos. The fluid was harvested after 48 hours nd its agglutinating titre tested by Hirst's method. The welve positive strains were regarded as distinct until hey had been compared antigenically one with another nd with other known strains. Owing to the number nvolved it was impossible to proceed with them all.

ABLE IV—ANALYSIS OF FERRET SERA AFTER INOCULATION WITH INFECTED ALLANTOIC FLUID (TITRE 128)

Specific antigen	Specific ferret antiserum				
	LEE	CRA	LEI	CLE	CLA
LEE ..	512	64	32	32	32
CRA ..	64	2048	1024	2048	2048
LEI ..	32	2048	2048	2048	2048
CLE ..	64	1024	1024	2048	2048

ANTIGENIC COMPARISON

An early attempt was made to compare the current trains with previously isolated B strains, the standard (Lee) strain and the Paddington strain. Two recent trains, Eliz B and Mil B from an epidemic in Melbourne 1945, were sent to England by air by the kindness of r. F. M. Burnet.

Specimens of allantoic fluid from each of the five trains—Lee, 4 current strains, Paddington, Eliz B, and il B—were inoculated into ferrets for the production of pecific ferret antiserum. Owing to the difficulty experinced in adapting the current strains to mouse lung ee below), the only attempt at antigenic comparison as by Hirst's test. Table IV shows the comparison etween the Lee and four of the current strains, CRA, EI, CLE, CLA. These four appeared to be distinct from ee but to be themselves closely related. There was no elation to the A virus. Table V shows a further analysis f several different B strains with their respective ferret ntisera. It can be seen that the Lee and the remainder, xcept possibly the Paddington, are distinct; there ppears to be a fairly close connexion between the CRA, liz B, and Mil B, though there are possibly some small ntigenic differences in the remainder of the subgroup. here is some tendency, also noted by Francis et al. 946) in the case of rabbit sera, for freshly isolated strains to be very susceptible to agglutinin inhibition heterologous and even normal sera.

In view of the differences between Lee and 1946 rains, human sera showing no antibody rise against Lee were retested against the CRA strain. For example, of 10 sera tested from a small epidemic at a school in Dorset, 5 were positive to B (Lee) and 5 negative to A and B. When these sera were retested with the current strain (CRA), 2 of the negative sera proved to be positive, and the rise in antibody in those previously positive was greater with the CRA virus than with the Lee. Sera from several other sources which showed less than a fourfold rise in antibody to the Lee virus were then retested with the Lee and CRA strains. Of 103 pairs of sera so tested, 55 showed no rise in antibody with either strain, 25 a twofold rise with both, 17 a twofold rise with CRA only, and 6 a fourfold rise with CRA without any corresponding rise with the Lee. A further 53 pairs of positive sera were tested with both strains: 29 showed a fourfold rise with both, 14 a fourfold rise with Lee and eightfold or greater with CRA, and 10 a sixteenfold rise with Lee and only a fourfold rise with CRA.

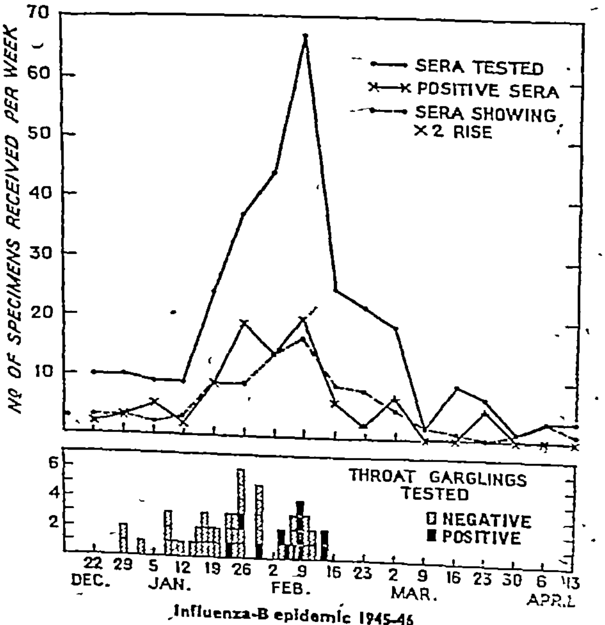
TABLE V—FURTHER ANALYSIS OF FERRET SERA

Specific antigen	Specific ferret antiserum					
	LEE	CRA	Eliz B	Mil B	Paddington	P.R.8
LEE ..	2048	64	64	64	256	8
CRA ..	256	1024	256	256	256	16
Eliz B ..	256	256 +	512	512	512	8
Mil B ..	256	256	256	512	512	8
Paddington	1024	64	256	256	2048	16
P.R.8 ..	16	8	8	8	8	4096

A group of 24 persons was vaccinated with influenza-virus vaccine containing both A (P.R.8) and B (Lee) viruses through the coöperation of the medical superintendent, Darenth Park, Dartford, Kent. Serum samples were taken before and after vaccination and were tested for antibody rise by Hirst's method. The results showed an equal rise in B antibody to both Lee and CRA viruses. Such a result is encouraging, since it indicates that current vaccines, in which Lee virus is used, are likely to be as effective in protection against other strains of B as against the Lee virus.

INOCULATION OF FERRETS

Between November, 1945, and March, 1946, garglings from 45 patients and suspensions of lung from 2 fatal



Influenza-B epidemic 1945-46

8 2

cases of pneumonia were inoculated intranasally into anæsthetised ferrets. In most instances fresh material was used, but occasionally it had been stored for a short time at −76° C before being tested. No definite symptoms or pathological changes in upper respiratory tract or lungs were produced. Only 4 ferrets showed any fever, and from these no transmissible infectious agent was recovered. Even strains well established in eggs did not produce symptoms. With 2 strains serological evidence indicated that an inapparent infection was being passed in the ferrets, but four and five passages did not enhance the virulence of the strains for ferrets; this experience resembled that of Stuart-Harris et al. (1943). Serum samples were taken three or four weeks after infection from 27 ferrets inoculated with throat garglings; of these 4 were found to have developed antibodies to virus B, as shown by the Hirst test. Of 12 ferrets inoculated later with infected allantoic fluid all showed a rise in antibody to B virus.

ADAPTATION TO MICE

Attempts were made to adapt to mice 6 of the 1946 B viruses which had been isolated in chick embryos. These had received two amniotic and one or two allantoic passes and had developed good agglutinating power for fowl red cells before being inoculated intranasally, in the form of undiluted allantoic fluid, into mice. Of the 6 strains so tested, 4 produced extensive consolidation in the lungs of the first mice inoculated; this was as extensive in mice killed after four days as in those killed after eight days. No mice, however, died of the infection.

Previous experience with virus A led to the expectation that no difficulty would be encountered in transferring the infection serially, and in rapidly enhancing its virulence till it would kill the mice regularly; but, on the contrary, the extensive lung-consolidation seen in the first mice was never observed again. Much smaller lung lesions, involving an eighth or less of the lung, were seen in mice of some of the following passages, but there was no tendency for them to increase as transfer was carried on. That virus was still present was shown by transfer back to chick embryos, the fluids of which promptly acquired the specific red-cell-agglutinating properties of virus B. The small areas of pneumonia were detected to a varying degree up to 6, 6, 6, 7, 12, and 16 passages for the 6 strains. In the case of 3 strains virus was finally lost altogether, as judged by inability to infect eggs any longer. Passage of the other 3 was abandoned when it no longer seemed profitable.

Several modifications in technique were used in the hope of helping the adaptation to mice. Passage was carried out at intervals of two days, of three or four days (this was the usual practice), or of seven days. Virus survived for at least three passages at two-day and at least four passages at seven-day intervals, but no exaltation of virulence developed. Mixture with normal allantoic fluid was of no avail. Swiss mice were no better than our other (Parkes) strain of white mice. Mice from two to three weeks old were little if at all more sensitive than older ones. Cotton-rats proved no more susceptible than mice. One hamster inoculated with undiluted allantoic fluid died with complete lung-consolidation three days later, but attempts to produce a transmissible pneumonia in hamsters were not successful.

It seems possible that the lesions produced in the first mice inoculated were due to the "toxic" action of the large amount of virus present. Such an action has been produced in the rabbit's eye by Evans and Rickard (1945) and the mouse's brain by Hale and McKee (1945). The effects which these workers produced were not apparently associated with virus multiplication. Our findings recall strongly those recorded by Eaton et al. (1945) for their atypical pneumonia virus; this was transmitted as a symptomless infection in chick embryos, the fluids of which produced in cotton-rats and hamsters a pneumonia which was not serially transmissible.

VACCINATION OF HUMAN BEINGS

Trials were carried out of a polyvalent A and B vaccine (P.R.8 and Lee strains) made from fluids of infected chick embryos according to the method of Francis and Salk (1942). Several thousand doses were used on the Continent, and several thousand in this country. It is not proposed to report the results in detail now, because the incidence of clinical influenza was so low in nearly all the tested groups that no assessment of the value of the vaccine was possible. It may be said, however, that in the only two considerable groups with a high incidence the vaccine apparently had some beneficial effect. Thus among medical students at Glasgow 9 of 105 controls developed influenza (8·6%); most of these were proved serologically to be influenza B; only 2 of 115 vaccinated persons (1·7%) were affected. At Woolwich Arsenal 68 of 622 controls (10·9%) and 31 of 609 vaccinated (5·1%) developed influenza. Serological tests were not carried out here. Perhaps because of the low incidence and because most inoculations were not done until the outbreak was already under way, the benefit was less striking than that lately reported by Francis et al. (1946).

DISCUSSION

The influenza-B outbreak now reported is the first on record for Britain caused almost wholly by the B virus; it is further worth considering in relation to the recent behaviour of virus B in the rest of the world. According to Francis et al. (1946), influenza B was endemic in 1945 in the U.S.A., giving rise to localised outbreaks in every month of 1945 from March onwards but causing more widespread trouble in November and December. Other accounts emphasised its appearance in June, 1945, in the Pacific (in Hawaii and Guam) and its apparent spread southwards to Australia in November, 1945 (cf. Burnet et al. 1946), and eastwards to the Caribbean area, the northern part of South America, Texas, and further north in the U.S.A. Burnet's account of its clinical and epidemiological behaviour is an almost exact counterpart of our own experience—particularly its mildness and apparently capricious incidence with a tendency to attack younger age-groups. This, together with the similar biological behaviour and close serological relation we have found between the Australian and British strains, suggests that virus B may in fact have been travelling round the world. The view that such may happen is not necessarily in conflict with the concept that influenza viruses—A or B—may be endemic in many countries, awaiting suitable conditions to start an epidemic. Shope (1943) has convincingly presented the arguments for such a state of affairs as regards swine influenza. But the recent world-wide occurrence of influenza B suggests that a virus—perhaps as a result of the appearance of an antigenic variant in one of its endemic foci—may at times spread very widely, as pandemic influenza certainly did in 1918. The influenza B of 1945–46 was fortunately mild and the virus certainly not widely dissimilar from other B strains.

In this laboratory we have been hitherto unsuccessful in repeating the isolation of influenza-A viruses directly from human garglings into embryonated eggs—as described by Burnet (1935) in Australia and later confirmed in America (Hirst 1945). It remains uncertain whether our success with B viruses this year is due to the inherently greater ease of isolating B viruses, as contrasted with A, or to some other factor.

SUMMARY

Influenza, probably due to virus B, appeared in Holland and Belgium in December, 1945, but no widespread epidemic occurred in Ger

Britain a moderately extensive outbreak of a mild
of influenza began in January, reaching its peak
end of January.

ological evidence indicated that 34% of the cases
een December and March were due to influenza
B. We know that not all the cases of B-virus
ion show a specific serological response; so it is
that virus B was the major cause of the outbreak.
rrets did not show a febrile reaction when inoculated
1946 B viruses, but strains were successfully estab-
l by amniotic inoculation of fertile eggs. They
serologically rather distinct from the standard
B virus but very closely related to two strains
ted in Australia in November, 1945.

wish to thank for their help Brigadier J. S. K. Boyd,
or of pathology, War Office; Dr. G. E. Godber and
officers of the Ministry of Health; the numerous
rs, Service and civilian, who kindly provided sera or
ings for test; the professors of pathology and bacteriology
the medical officers of factories and other doctors who
orated in trials of vaccine; Dr. Robert Cruickshank,
al Public Health Laboratory, Colindale, for his assist-
in distributing the vaccine to those concerned in the
and our assistants, Sergeant W. A. Fitzgerald, R.A.M.C.,
E. Brodaty, and Mr. E. E. Owen, who gave valuable
ical assistance.

REFERENCES

idge, W. I. B., Burnet, F. M. (1946) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 256.
et, F. M. (1935) *Brit. J. exp. Biol.* 18, 282.
Bull, D. R. (1943) *Aust. J. exp. Biol. med. Sci.* 21, 55.
Stone, J. D., Anderson, S. G. (1946) *Lancet*, i, 807.
, M. D., Meiklejohn, G., van Herick, W., Corey, M. (1945) *. exp. Med.* 82 317.
s, C. A., Rickard, E. R. (1945) *Proc. Soc. exp. Biol., N.Y.* 8, 73.
ls, T. jun., Salk, J. E. (1942) *Science*, 96, 499.
— Brace, W. M. (1946) *J. Amer. med. Ass.* 131, 275.
W. M., McKee, A. P. (1945) *Proc. Soc. exp. Biol., N.Y.* 59, 81.
, W., Henle, G., Stokes, J., Maris, E. P. (1946) *J. Immunol.* 2, 145.
G. K. (1942) *J. exp. Med.* 75, 49.
(1945) *Proc. Soc. exp. Biol., N.Y.* 58, 155.
on, W. P. U. (1946) *Lancet*, Nov. 2, p. 631.
, R. E. (1943) Virus Diseases, New York, p. 85.
-Harris, C. H. (1943) *Brit. J. exp. Path.* 24, 33.
Glover, R. E., Mills, K. C. (1943) *Lancet*, ii, 790.

FLUENZA B AMONG WEST INDIANS

BREAKS IN THE BAHAMAS AND IN ENGLAND

W. P. U. JACKSON
M.B. Camb., M.R.C.P.
LIGHT-LIEUTENANT R.A.F.V.R.; FORMERLY MEDICAL
SPECIALIST IN THE BAHAMAS

E two outbreaks of influenza described here, one
ew Providence Island, Bahamas, and the other
ngland, were almost entirely restricted to coloured
The attack-rate was very high, and the type of
monic complication was unusually uniform. In
outbreaks evidence was obtained incriminating the
nza-B virus.

In the Bahamas

the summer of 1945 an epidemic of an upper respira-
disease, which was almost certainly influenza,
out on New Providence Island, Bahamas, British
Indies. No record of any previous epidemic of
nza in the Bahamas has been found, nor of any
ar "reverse colour-bar" having been exerted by
nfluenza virus. In the pandemic of 1918–19 it was
ved that non-Europeans of several races were more
and more severely attacked than Europeans
ch 1920), but never was the difference so great as
e present outbreak.

e epidemic is described here as it affected Service-
only. There was a concurrent outbreak of influenza
g the civilian native population, but details are not
able. British white personnel in the R.A.F. on
Providence numbered a little over 2000, divided
ly between two airfields eight miles apart. The coloured troops included some 370 men of the Bahamas Defence Corps (B.D.C.) and 280 men of the Bahamas Air Service Squadron (B.A.S.S.). The B.D.C. were billeted in the city of Nassau, and the B.A.S.S. on an airfield four miles away. These troops would, of course, mix in the town in the evenings. At the time of the outbreak there were also some 15 coloured patients in the R.A.F. hospital, at a third separate location, drawn from either contingent. Some B.A.S.S. men worked in the hospital, and, together with the patients' visitors, provided opportunity for dissemination of infection there. There were, then, three nuclei of coloured Servicemen—B.D.C., B.A.S.S., and hospital patients—and the outbreak attacked all three simultaneously (fig. 3). (The term "coloured" is used to include half-caste mulattoes who were serving in the Forces with the pure negroes and were attacked in a proportion at least equal to them.)

HISTORY OF OUTBREAK

The mode of entrance of the influenza virus to the island was not ascertained. The epidemic certainly involved other islands of the Bahamas group, but not the mainland of Florida, which is the nearest land to this archipelago, about sixty miles away from its tip.

Though a few cases of a febrile influenzal type of illness had been occurring in coloured Servicemen from the middle of June, the first real intimation of the epidemic was on the afternoon of June 24, when 6 men, already in the hospital for other complaints (4 in the V.D. ward), complained of malaise, feverishness, aching in the back, and headache, and all had temperatures above 101° F. Next morning 64 men appeared on sick parade with the same symptoms, which had mostly started the day before.

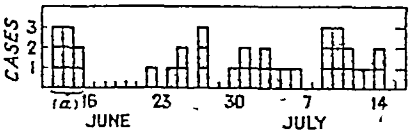


Fig. 1—Time distribution of 36 influenzal cases, admitted to hospital, among 2000 white troops in the Bahamas (attack-rate 1·5% for period *June 16–July 14*). Each square represents a case, and the date is that of the patient's first reporting to a doctor. *(a)* May 1–June 15.

Three Nissen huts were taken over for emergency hospital accommodation, one for B.A.S.S. men and two for B.D.C., in their respective camps. After this extremely explosive outbreak the case-incidence diminished daily. Fig. 1 shows that there was an increase of respiratory-tract and influenzal infection in the white troops at the same time, but this was very slight. The attack-rate for the month June 15–July 14 was 1·5% of this population at risk, while the corresponding rate for native troops was 34%. The total number of coloured men attacked and admitted to the wards was 219. Moreover, most of the upper respiratory-tract infection in the whites at this time was more coryzal than influenzal, and clinically more deserving of the name "febrile catarrh" (Stuart-Harris et al. 1938) than influenza.

This case-incidence of 34% is very high, particularly for an epidemic of the single-peak type. The attack-rate in a severe epidemic is usually about 10–20% (Stuart-Harris 1945, Van Rooyen and Rhodes 1940). Stuart-Harris saw an outbreak in a boys' school in 1937 reaching 50%, but virus was not recovered; Hare et al. (1943a) reported a case-incidence of over 30% of influenza-B infection in parts of Canada in 1943. Such figures are unusually high, except in establishments in which personnel is continually changing—e.g., Coleman (1944) noted that 40% were infected in an outbreak in a R.A.F. recruit camp, or 75–80% if ambulant cases were included. The Bahamians were not recruits, and neither contingent was subject to continuous change of personnel; in fact more changes took place among the white R.A.F. troops.

TABLE I—CONVALESCENT AGGLUTININ-INHIBITION TITRES

Patient	Influenza A	Influenza B	Result
1	128	512	? Positive B
2	64	128	? Positive B
3	64	512	? Positive B
4	8	128	? Positive B
5	32	1024	? Positive B
6	64	512	? Positive B
7	8	128	? Positive B
8	8	8	Negative
9	128	1024	? Positive B
10	32	512	? Positive B
11	8	256	? Positive B

In the Bahamas epidemic, only febrile patients admitted to hospital are included in the figures. Many more besides these were less severely affected, and it is almost certain that the full attack-rate of the coloured troops at risk was above 50%. Incidentally, of the British troops who did succumb a high proportion were medical staff who had been dealing with coloured influenza patients.

CLINICAL FEATURES

The clinical features of the cases were remarkably uniform and conformed almost exactly to those described in other proved influenzal epidemics—e.g., Stuart-Harris's (1945) description of influenza-A infection. The main point of difference from his description was the type of onset often encountered in this epidemic. Thus, in about 45% of cases it was insidious, with a premonitory phase including vague feelings of malaise for two or three days, with some frontal headache, perhaps a pain in the substernal region, and a little cough. There would then be an acute exacerbation, usually in the evening, with shivering, feverishness, increased malaise, and weakness, together with other usual influenzal symptoms and a rise of temperature to perhaps 102° F. Now, an insidious onset has been described by some authors (Hare et al. 1943b, Beveridge and Williams 1944) as more characteristic of infection by influenza-B virus. However, they also describe frequent premonitory coryzal symptoms, which were very rare here, though such symptoms developed during the course of the fever in 20% of the cases. In the influenza-B outbreak described by Nigg et al. (1942) exactly the same percentage of cases developing coryzal symptoms was noted.

The fever lasted 2–6 days, and was often biphasic. There was no mental depression or debility after the attack. Total white-cell counts and chest radiography in a few cases selected at random gave results within normal limits in all uncomplicated cases.

PNEUMONIA AS A COMPLICATION

The epidemic was complicated by pneumonia in 21 patients, all of whom came from the B.D.C. but were evenly distributed between the two emergency hospital huts in which they were housed. The proportion of pneumonia developing in all coloured patients was thus 9·6%, or in the B.D.C. contingent 13·8%. All cases started within the nine days July 1–9 (as shown in fig. 2), and there had been no pneumonia in the native troops in the previous two months. The time of onset of the pneumonia varied from 0 to 14 days after the patient's originally reporting sick with the symptoms of influenza, such intervals being similar to those described in other epidemics (French 1920, Scadding 1937, Lennette et al. 1941).

The type of pulmonary involvement was remarkably uniform and represented a fairly typical picture of rather mild localising pneumococcal lobar pneumo throughout, in sharp distinction to other previous recorded outbreaks of "influenzal pneumonia" (Leic tenstern 1912, Chickering and Park 1919, Stone an Swift 1919, French 1920, Scadding 1937, Maude 19 Lennette et al. 1941). In the present series there no necropsies, but radiographic evidence always [illegible] the physical signs.

The onset, in all but one patient, was abrupt, wit pleuritic pain and often a rigor. The temperatur exceeded 104° F in every case and remained high until it defervescence, which was usually by crisis. The physica signs suggested in each case a localised area of confluent consolidation. Sputum from every patient showed considerable numbers of gram-positive cocci in pairs in the direct smear and grew pneumococci on blood-agar, usually in pure culture. Pneumococci were also grown from the blood of one patient. In every patient but one, radiography showed localised unilateral changes in one zone of the lung fields, suggesting consolidation. In the one case it seemed likely that radiographic evidence was obscured by heart shadow. All cases except four responded to sulphadiazine within forty-eight hours. The fall of temperature was more delayed in three cases, and an empyema developed in the fourth.

SEROLOGICAL DATA

Single specimens of convalescent serum were obtained from 11 patients, in each case about fourteen days after the onset of the illness. The sera were analysed at the Army Medical School, Washington, D.C., and the results received from Colonel J. Smadel are shown in table I. The agglutinin-inhibition titres (Hirst test), in all but one case, were higher for influenza-B virus than for influenza-A virus, and afford presumptive evidence of influenza-B infection, especially where such titres as 1/1024 were recorded. Moreover, the one definitely negative serum, whose titre of 1/8 was so much lower (16 times) than the next lowest titre, makes it even more probable that the others had been recently infected with influenza-B virus.

PNEUMONIA IN RELATION TO TYPE OF INFLUENZA

Most previous reports of post-influenzal pneumonia were probably drawn from influenza-A outbreaks. Such pneumonia seems always to have

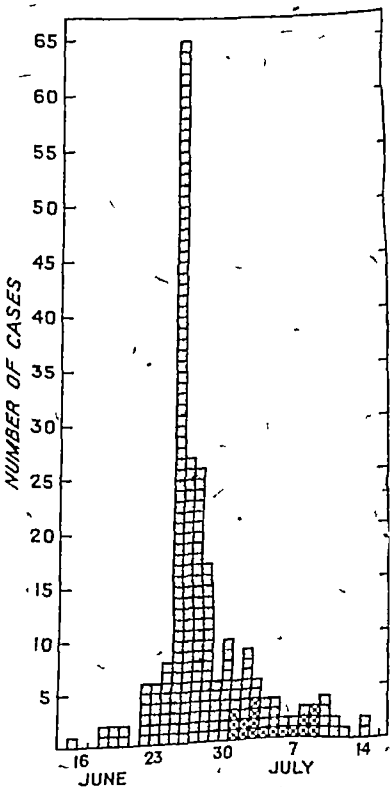
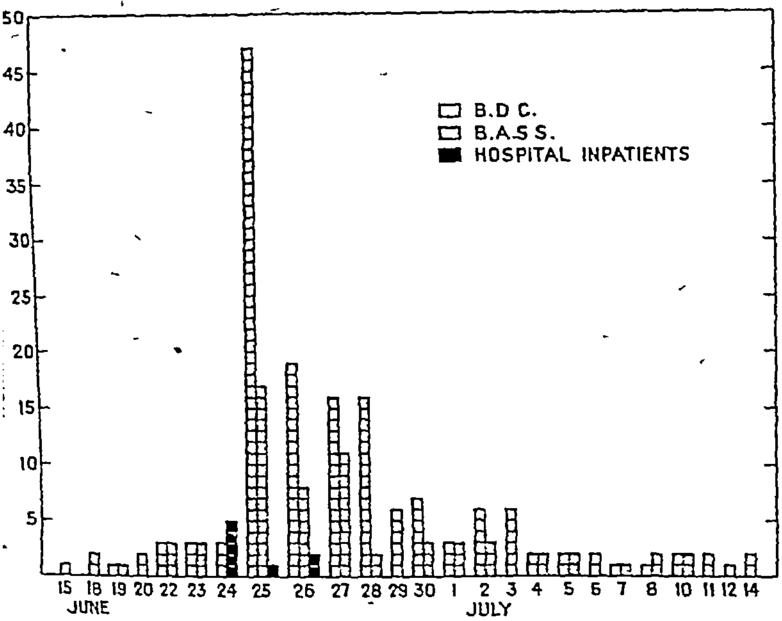


Fig. 2—Time distribution of 219 influenzal cases, admitted to hospital, among 650 coloured troops in the Bahamas (attack-rate 34%). The date is that of the patient's first reporting to a doctor. There were no cases in the period May 1–June 14. Each cross represents onset of pneumonia as a complication.



ig. 3—Time distribution of the same influenzal cases as in fig. 2, according to source, plus 8 hospital inpatients.

differed vastly from the true classical lobar type. Now, pneumonic involvement following influenza B is believed to be less common than after an influenza-A infection (Stuart-Harris 1945). Nigg et al. (1942) reported an influenza-B outbreak in 76 patients and staff of a mental hospital in Minnesota in 1942. Pathological changes were demonstrated by radiography of the chest in 8 patients, and 4 were said to have had lobar pneumonia. All these 4 patients died. Pneumococci were isolated from the sputum of all 8 patients. Otherwise little seems to have been published on influenza-B pneumonia since the discovery of the influenza-B virus by Francis (1940), though there have been reports from America of fourfold rises in B antibody serum titre in outbreaks of clinically non-influenzal true lobar pneumonia, without any concurrent influenza in the neighbourhood (*United States Army Medical Department Bulletin* 1945).

RELATION OF EPIDEMIC TO INFLUENZA ELSEWHERE

Since the middle of April, 1945, there had been small outbreaks of influenza in many parts of the world, and whenever a virus was incriminated it turned out to be the influenza-B virus. Places concerned included Colorado,* Texas* (June and July), Indiana,* S. Carolina, Virginia, California,* Washington, and Dakota * in the United States; the Hawaiians * (June), Guam,* Manila (May–July), Alaska,* Panama * (July), and S. America (July and August). It was even recorded in other islands of the West Indian group, in Jamaica (June) and Dominica (July and August). (*United States Army Medical Department Bulletin* 1945, *Epidemiological Information Bulletin of the* UNRRA *Health Division* 1945).

The Bahamas epidemic thus coincided chronologically with influenzal outbreaks in other parts of the world, and it is interesting that influenza-B virus was incriminated in many of them. All these outbreaks were in general similar in that they were sharply localised (in other places to a single camp or barracks, in the Bahamas to a single race) and showed an absence of postinfective asthenia, few severe complications, and few deaths.

In England

EPIDEMIOLOGY

On the four days Dec. 27–30, 1945, 10 coloured Jamaican Servicemen contracted a disease, clinically indistinguishable from influenza, on a R.A.F. station in Berkshire with a total strength of about 1000, of whom some 65 were Jamaicans. In and about the same period there was an undoubtedly increased morbidity-rate of upper respiratory-tract infection among the white troops; but, though some of this was influenzal in type, most resembled febrile catarrh or acute coryza. In figs. 4 and 5 only cases of influenzal or febrile catarrhal type occurring in the unit and necessitating admission for over forty-eight hours are included. This picture was an almost exact replica in miniature of the Bahamian epidemic.

The 10 Jamaicans who were infected worked in different sections on the same camp, the first 6 having their sleeping-quarters in the camp, whereas the other 4, taken ill on the 30th, all slept some four miles away. None of these patients were recent arrivals in the unit, and none had been on leave during the preceding week. During the same period there were several afebrile cases of upper respiratory-tract infection which may well have been influenzal, but these are not included; hence the attack-rate, among Jamaicans, of 15% in this small peak is a minimum.

Following this outbreak there were one or two scattered cases of influenzal illness, and then another peak in February, when in the five days Feb. 1–5 8 more Jamaicans were attacked. The two waves are shown in fig. 5. The outbreak then came to a close. The clinical attack-rate for Dec. 28–Feb. 14 was 32% of the coloured population at risk and 2·2% for the whites.

CLINICAL NOTES

First Wave.—Clinically the pictures were those of typical epidemic influenza. An insidious onset with primary coryzal symptoms, reported by some authors to characterise infection with influenza-B virus, was noted in 1 case only, though 2 patients had a previous chronic nasal catarrh, a very common complaint of West Indians in this country. The clinical picture was identical with that of the Bahamas epidemic, except that a true biphasic temperature chart was not observed and the mean duration of fever was a little less. One interesting point was that out of six differential blood films examined at the Radcliffe Infirmary, four showed atypical lymphocytes resembling Downey type 1 glandular-fever cells, and in three the mononuclear cells made up more than 50% of the total white cells (52%, 55%, 69%). On re-examina-

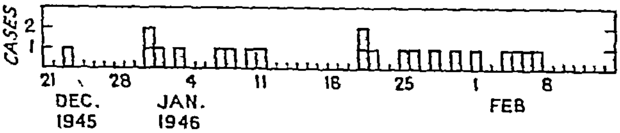


Fig. 4—Time distribution of 21 influenzal cases, admitted to hospital, among 950 white troops at a R.A.F. station in Berks (attack-rate 2·2%).

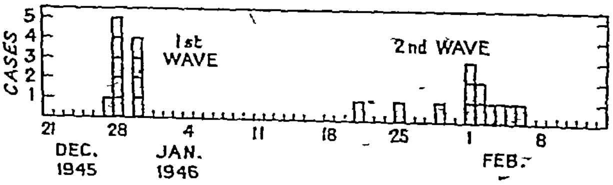


Fig. 5—Time distribution of 22 influenzal cases, admitted to hospital, among 65 coloured troops at the same R.A.F. station as in fig. 4.

---

* Influenza-B virus was incriminated here.

TABLE I—CONVALESCENT AGGLUTININ-INHIBITION TITRES

Patient	Influenza A	Influenza B	Result
1	128	512	? Positive B
2	64	128	? Positive B
3	64	512	? Positive B
4	8	128	? Positive B
5	32	1024	? Positive B
6	64	512	? Positive B
7	8	128	? Positive B
8	8	8	Negative
9	128	1024	? Positive B
10	32	512	? Positive B
11	8	256	? Positive B

In the Bahamas epidemic, only febrile patients admitted to hospital are included in the figures. Many more besides these were less severely affected, and it is almost certain that the full attack-rate of the coloured troops at risk was above 50%. Incidentally, of the British troops who did succumb a high proportion were medical staff who had been dealing with coloured influenza patients.

CLINICAL FEATURES

The clinical features of the cases were remarkably uniform and conformed almost exactly to those described in other proved influenzal epidemics—e.g., Stuart-Harris's (1945) description of influenza-A infection. The main point of difference from his description was the type of onset often encountered in this epidemic. Thus, in about 45% of cases it was insidious, with a premonitory phase including vague feelings of malaise for two or three days, with some frontal headache, perhaps a pain in the substernal region, and a little cough. There would then be an acute exacerbation, usually in the evening, with shivering, feverishness, increased malaise, and weakness, together with other usual influenzal symptoms and a rise of temperature to perhaps 102° F. Now, an insidious onset has been described by some authors (Hare et al. 1943b, Beveridge and Williams 1944) as more characteristic of infection by influenza-B virus. However, they also describe frequent premonitory coryzal symptoms, which were very rare here, though such symptoms developed during the course of the fever in 20% of the cases. In the influenza-B outbreak described by Nigg et al. (1942) exactly the same percentage of cases developing coryzal symptoms was noted.

The fever lasted 2–6 days, and was often biphasic. There was no mental depression or debility after the attack. Total white-cell counts and chest radiography in a few cases selected at random gave results within normal limits in all uncomplicated cases.

PNEUMONIA AS A COMPLICATION

The epidemic was complicated by pneumonia in 21 patients, all of whom came from the B.D.C. but were evenly distributed between the two emergency hospital huts in which they were housed. The proportion of pneumonia developing in all coloured patients was thus 9·6%, or in the B.D.C. contingent 13·8%. All cases started within the nine days July 1–9 (as shown in fig. 2), and there had been no pneumonia in the native troops in the previous two months. The time of onset of the pneumonia varied from 0 to 14 days after the patient's originally reporting sick with the symptoms of influenza, such intervals being similar to those described in other epidemics (French 1920, Scadding 1937, Lennette et al. 1941).

The type of pulmonary involvement was remarkably uniform and represented a fairly typical picture of rather mild localising pneumococcal lobar pneum throughout, in sharp distinction to other prev recorded outbreaks of "influenzal pneumonia" (Le tenstern 1912, Chickering and Park 1919, Stone Swift 1919, French 1920, Scadding 1937, Maude 19 Lennette et al. 1941). In the present series there no necropsies, but radiographic evidence always supp the physical signs.

The onset, in all but one patient, was abrupt, pleuritic pain and often a rigor. The temperatu exceeded 104° F in every case and remained high until it defervescence, which was usually by crisis. The physica signs suggested in each case a localised area of confluen consolidation. Sputum from every patient showed considerable numbers of gram-positive cocci in pairs i the direct smear and grew pneumococci on blood-agar, usually in pure culture. Pneumococci were also grown from the blood of one patient. In every patient but one, radiography showed localised unilateral changes in one zone of the lung fields, suggesting consolidation. In the one case it seemed likely that radiographic evidence was obscured by heart shadow. All cases except four responded to sulphadiazine within forty-eight hours. The fall of temperature was more delayed in three cases, and an empyéma developed in the fourth.

SEROLOGICAL DATA

Single specimens of convalescent serum were obtained from 11 patients, in each case about fourteen days after the onset of the illness. The sera were analys at the Army Medical School, Washington, D.C., and t results received from Colonel J. Smadel are shown i table I. The agglutinin-inhibition titres (Hirst test, in all but one case, were higher for influenza-B virus than for influenza-A virus, and afford presumptive evidence of influenza-B infection, especially where such titres as 1/1024 were recorded. Moreover, the one definitely negative serum, whose titre of 1/8 was so much lower (16 times) than the next lowest titre, makes it even more probable that the others had been recently infected with influenza-B virus.

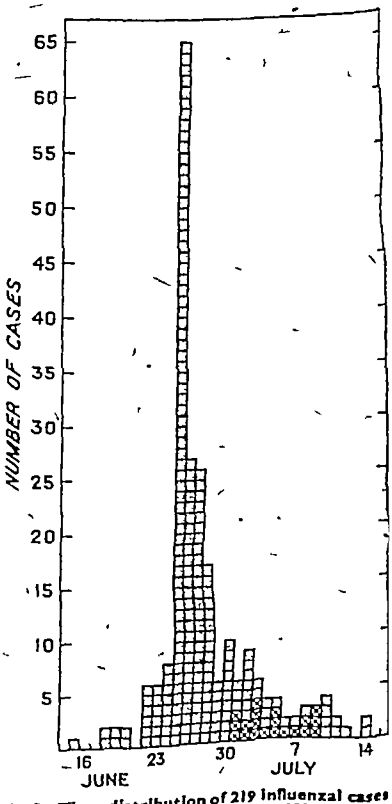


Fig. 2—Time distribution of 219 influenzal cases admitted to hospital, among 650 coloured troops in the Bahamas (attack-rate 34%). The date is that of the patient's first reporting to a doctor. There were no cases in the period May 1–June 14. Each cross represents onset of pneumonia as a complication.

PNEUMONIA IN RELATION TO TYPE OF INFLUENZA

Most previous reports of post-influenzal pneumonia were probably drawn from influenza-A outbreaks. Such pneumonia seems always to have and was recalled strikingly by the single case which occurred as a complication in the outbreak in England.

I am greatly indebted to Captain J. A. Dudgeon for analyses of the 1946 sera; to Colonel J. Smadel, of the Army Medical School, Washington, D.C., by whose courtesy Dr. J. Salk kindly obtained and forwarded the results of serum analyses performed in America; to Dr. R. L. Vollum for his help in obtaining serum samples; and to Squadron-Leader H. Halson and other station medical officers for permission to use their data.

REFERENCES

Beveridge, W. I. B., Williams, S. E. (1944) *Med. J. Aust.* ii, 77.
Chickering, H. T., Park, J. H. (1919) *J. Amer. med. Ass.* 72, 617.
Coleman, F. H. (1944) Thesis for the Degree of M.D., Cambridge.
Epidemiological Information Bulletin (1945) 1, 631.
Francis, T. jun. (1940) *Science*, 92, 405.
French, H. (1920) *Rep. publ. Hlth med. Subj.* no. 4.
Halson, H. (1946) Personal communication.
Hare, R., Stamatis, D. M., Jackson, J. (1943a) *Canad. J. publ. Hlth*, 34, 442.
— Hamilton, J., Feasby, W. R. (1943b) *Ibid*, p. 453.
Hirst, G. K. (1942) *J. exp. Med.* 75, 49.
Leichtenstern, O. (1912) Influenza, Vienna and Leipzig.
Lennette, E. H., Rickard, E. R., Hirst, G. K., Horsfall, F. L. jun. (1941) *Publ. Hlth Rep., Wash.* 56, 1777.
Maude, A. (1918) *Lancet*, ii, 324.
Nigg, C., Eklund, C. M., Wilson, D. E., Crowley, J. H. (1942) *Amer. J. Hyg.* 35, 265.
Scadding, J. G. (1937) *Quart. J. Med.* 6, 425.
Stone, W. J., Swift, G. W. (1919) *J. Amer. med. Ass.* 72, 487.
Stuart-Harris, C. H. (1945) *Brit. med. J.* i, 209.
— Andrewes, C. H., Smith, W. (1938) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 228.
United States Army Medical Department Bulletin (1945) 4, 369, 493.
Van Rooyen, C. E., Rhodes, A. J. (1940) Virus Diseases of Man, London, p. 558.

ICTERUS GRAVIS NEONATORUM

END-RESULTS OF TREATMENT BY BLOOD-TRANSFUSION

HENRY THIRD
M.B. Aberd.

THE father of a baby with icterus gravis neonatorum asked me: "What do you promise me if you save the baby's life by blood-transfusion? A normal child? Or will it have something wrong with it?" This question prompted me to visit personally and review six babies whom I had successfully treated by blood-transfusion for this disease in 1944 and early 1945.

The average age of the babies is now eighteen months, and the accompanying table shows the genotype of the parents, the number of siblings in each family, and the end-result of survival by treatment with blood-transfusion. As most textbooks give only a short space to this grave disease of the newborn, perhaps it may serve some purpose to discuss the ætiology, diagnosis, and treatment in the light of recent research.

CASE 1.—The third child of the family, and the second to be affected, this baby had severe jaundice and showed signs of cerebral irritation due to affection of the nuclei of the brain by the jaundice (a true kernicterus). The Hb was never below 60% (Sahli), and there was no evidence of erythroblastæmia in the blood film. Four transfusions of 100 c.cm. of group-O Rh-negative blood were given. The end-result is an imbecile child.

CASE 2.—This baby was brought to hospital, thirteen days after birth, because of extreme anæmia, and was moribund. The blood-count was below 700,000, Hb 18% (Sahli), and erythroblasts and normoblasts comprised 20% of the field in the blood film. The baby was transfused once with 120 c.cm. of group-O Rh-negative blood and made a rapid recovery.

In this family the first five children were normal. After a severe miscarriage the mother was given a transfusion of an apparently homologous blood and had a most severe reaction (the blood was probably homologous within the ABO system only). The sixth child, born the following year, was extremely jaundiced and died of meningitis (kernicterus?) at four months; it was born jaundiced and remained jaundiced. The seventh child (case 2), the mother avers, was born "not yellow but pale, and grew paler." The child is now extremely healthy and robust.

CASE 3.—This was a second sibling, again showing erythroblastæmia, anæmia, &c. It was transfused three times with 100 c.cm. of group-O Rh-negative blood. It is now a normal healthy child.

CASES 4 and 5.—Twin girls with jaundice at birth and both showing erythroblastæmia, but the twin with the least evidence of erythroblastosis was the more deeply jaundiced and more gravely ill. They were each transfused with 120 c.cm. of group-O Rh-negative blood. The twin which showed the more toxic symptoms is undoubtedly by far the more backward. It is spastic and cannot walk or feed itself, whereas the other is apparently a normal healthy child.

CASE 6.—This is the third child of the family, and the first to be affected. It was extremely jaundiced (toxic) and showed no evidence of interference with the hæmopoietic system. It had retraction and fixation of the head and neck, and was extremely sensitive to touch and light. I am not yet prepared to say whether it is a normal child—I doubt it.

ÆTIOLOGY

There seems now to be no doubt but that icterus gravis neonatorum is caused by the iso-immunisation of the mother, by an antigen present in the fœtus (inherited from the father) which the mother lacks, and the subsequent passage of the antibody to this antigen into the fœtal circulation, where it exerts its noxious effect in different ways. Much has been written since 1944 about the rhesus antigens; the number of different antigens seems to increase monthly. There is also no doubt but that iso-immunisation of the mother takes place outside the rhesus system—indeed within the ABO system (McCall et al. 1944). Numerous instances have been reported during the past year.

DIAGNOSIS

A common feature of all cases of icterus gravis neonatorum is jaundice apparent at birth or appearing within a day or two of birth. The vernix caseosa may be very yellow. The typical and bizarre picture of some cases of erythroblastæmia is not always present and is not essential to the diagnosis. Investigation of the family will usually show that the first child escapes the disease, as iso-immunisation of the mother is unlikely in a first pregnancy. At the same time it has to be remembered that, in these days of multiple blood-transfusions for *divers diseases*, a mother may be immunised against rhesus by having had transfusions of blood homologous within the ABO system only—the rhesus factor having been ignored (Callender et al. 1945). This is undoubtedly happening. The final test in the diagnosis is the discovery of anti-rhesus or other abnormal antibody in the maternal serum; "finding anti-rhesus in the maternal serum makes the diagnosis almost certain" (Taylor and Race 1944a).

There seem to be, however, three very distinct pathological types, and these three types suggest that so far the subject is not completely investigated:

(1) *Hydrops fœtalis*, where the child is usually stillborn or dies within an hour or two of birth. It is generally œdematous, usually jaundiced, with skin inclined to peel, and has all the signs of a most severe toxæmia with large effusions into the serous cavities.

(2) The *toxic jaundice* type, where clinically there is evidence of a very severe jaundice and generally symptoms of cerebral or extrapyramidal irritation. The child may show definite signs of cerebral irritation, such as the typical cry, fixed position, retraction of the head, and extreme sensitivity to touch or light. Generally there is no erythroblastosis and the jaundice is not due to hæmolysis and is the true icterus gravis neonatorum.

(3) The third type is the *true erythroblastæmia*, where the jaundice is not so severe. The child is more pale than yellow, and the jaundice seems to be due to hæmolysis. The anæmia is more evident to the eye than is the jaundice. Here the blood picture is typical of a profound

TABLE II—RESULTS OF SERUM ANALYSES

Race	Date of onset of illness	A		B		Result
		Acute	Convalescent	Acute	Convalescent	
Coloured ..	Dec. 28	64	64	64	512	Pos. B
„ ..	Dec. 28	128	128	128	1024	Pos. B
„ ..	Dec. 30	64	128	128	1024	Pos. B
„ ..	Dec. 30	64	256	128	1024	Pos. B
„ ..	Dec. 30	64	64	256	1024	Pos. B
White	Dec. 31	..	128	..	128	? Neg.
„	Jan. 1	..	32	..	64	? Neg.
„	Jan. 3	..	64	..	64	? Neg.
„	Jan. 8	..	64	..	128	? Neg.
„ { same patient (second attack) }	Jan. 7	..	64	..	128	? Neg.
	Feb. 7	64	128	128	512	Pos. B
Coloured ..	Feb. 2	128	512	128	128	Pos. A
„ ..	Feb. 2	128	128	128	256	Neg.
„ ..	Feb. 7	128	512	32	64	Pos. A
White	Feb. 7	32	128	16	16	Pos. A
„	Feb. 7	64	128	32	64	Neg.
Coloured (second attack)	February	64	..	512	256	Neg. B
White	February	64	128	64	128	Neg.

tion some weeks later the abnormality was still present. The Paul-Bunnell test was negative in 5 of these cases tested once.

Later cases among the Jamaicans, including those of the second wave, were much more catarrhal and in ordinary circumstances would not clinically be considered influenzal at all. In this they were more like the cases among the whites, in whom a coryzal onset was the rule (in 67% of patients, against 36% of Jamaicans, in the whole outbreak). In general, too, the later cases had a lower and shorter fever.

Throughout the whole outbreak the onset was very variable; it might be abrupt or follow premonitory symptoms which had lasted as long as a week, catarrhal or general, highly febrile or afebrile.

There were second attacks in 4 Jamaicans, days between the two onsets being 13, 30, 35, and 50. The serum of 1 was positive for influenza-A virus in the second attack. In all 4 cases the second illness was more coryzal, without general aching in back and limbs.

In these few cases there was no clinical distinction between patients whose serum gave a negative result, was positive for influenza-A virus, or positive for influenza B, except that the first wave of influenza-B patients presented more general constitutional symptoms and fewer catarrhal symptoms than did the later mixed cases—the opposite of previously recorded differences between influenza-A and influenza-B infections (Hare et al. 1943a and b, Beveridge and Williams 1944).

SERUM EXAMINATIONS FOR INFLUENZA-VIRUS ANTIBODY

Specimens of serum in both acute and convalescent stages were taken from 5 patients in the first wave, and in all cases the virus-B antibody titre was at least quadrupled in the second specimen. This outbreak was therefore one of influenza B. Convalescent sera samples only were taken a little later from 5 white patients who had had a clinically similar illness, but these did not show a high titre of either A or B antibody. One of these white men had a second influenzal type of illness a week after his serum sample had been taken, and a later sample showed that his second illness had been influenza B.

The results from the second peak were less ... Serum from 2 Jamaicans demonstrated influenza-A in tion, and from 1 other was negative. A second attack 1 Jamaican produced no rise in A or B antibody, h first illness having been influenza B. Of the white me was shown to have had influenza A, and the serum i others was negative. One of the latter was an in when his illness started, and so he was the of close observation from his first premonitory sympto He had a fairly severe attack of absolutely characteris clinical influenza, much more typical than that of so other patients whose sera were positive for either A or B This second peak, therefore, was composed of a mixtu of influenza A, an influenzal type of illness with negativ serology, and perhaps influenza B also, as opposed to the first, apparently pure, influenza-B wave.

All sera were examined at the National Institute for Medical Research by Hirst's standard technique (Hirst 1942), and I am indebted to Captain J. A. Dudgeon for the analyses (table II).

COMPLICATIONS

A moderately severe follicular tonsillitis developed 1 case about eight days after the onset of influenza and two days after the patient had been discharged from sick-bay. A lobar pneumonia developed in 1 patient just a week after his influenza started, when he appeared almost fully recovered from this. His history and appearance were identical with those of the Bahamian pneumonia patients, except that his sputum remained extremely scanty throughout and was never bloodstained.

COMPARISON WITH OTHER R.A.F. STATIONS

The records of five other stations in the vicinity were examined, and the doctors in charge were interviewed. It was found that there had been, at four of these, similar influenzal outbreaks, virtually confined to West Indians. The peaks in all cases coincided with the two periods Dec. 23–Jan. 5 and Jan. 27–Feb. 16. Unfortunately no serological examinations had been made, and so these records are of clinical interest only. The only station without a Jamaican influenzal wave was the nearest of all to the camp considered above, at which virus was incriminated.

At another station, in the Midlands, there was a wave among Jamaicans between Jan. 22 and Jan. 31: 64 cases occurred in some 296 West Indians (22%), but only 13 in some 2600 white personnel (0·5%) (Halson 1946). Serological investigations were positive for influenza-A virus in 3 cases and negative in 3 others, comparable to the findings in the second wave in Berkshire. Clinically the picture was typical of influenza, without any preponderance of catarrhal symptoms. There were no complications.

SUMMARY

Two epidemics of influenza are described showing extraordinary similarities in that the epidemic peak were made up entirely of coloured British West Indian personnel, despite differences of season and of country. The reason for this previously unrecorded phenomenon is not known.

There is evidence that the Bahamian epidemic was one of influenza B, whereas the more recent epidemic in England was mixed but due to influenza-B virus at the start.

Epidemiologically the outbreaks differed in that the one in England consisted of two waves; but the total attack-rate (32%) over the whole period of the outbreak in England was very similar to that (34%) in the single peak in the Bahamas.

Evidence from other stations suggests that these phenomena were generalised in England in the winter 1945–46 and not isolated occurrences at one camp only.

The uniform lobar type of pneumococcal pneumonia complicating the Bahamian epidemic was very unusual

DETECTION OF AMINO-ACIDS IN URINE AND OTHER FLUIDS

C. E. DENT
M.R.C.P.
RESEARCH ASSISTANT, MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL, LONDON

AMINO-ACIDS can be detected and identified in protein hydrolysates and other amino-acid mixtures by a method first used by Gordon et al. (1943) and further improved by Consden et al. (1944), who deal fully with the theory of their "partition chromatogram" and its application to amino-acid separations. It is only necessary to repeat here that the separation takes place owing to the different relative solubilities of each amino-acid between the water which is invariably held in the cellulose fibres of ordinary filter paper and a solvent, not miscible with water, which is allowed to creep slowly along the filter paper past a spot which contains the amino-acid mixture. The amino-acids are drawn along at definite speeds behind the moving solvent and thus arrange themselves in a characteristic order. After visible development by the ninhydrin reaction they can be provisionally identified.

In their original investigation Consden et al. (1944) took great care to avoid the presence of inorganic salts in the amino-acid mixture to be separated. They stated that "mixtures in which the ratio of soluble inorganic salts to amino-acids is high give unsatisfactory chromatograms." This, however, has not been my experience so far as concerns the inorganic salts constantly present in biological fluids, for their method has now been successfully applied to urine, protein-free blood filtrate, and other fluids, in which the ratio of inorganic salts to amino-acids may be anything up to 15 to 1. The method as now applied appears to constitute a valuable research and possibly diagnostic weapon.

TECHNIQUE

Full details as applied to pure amino-acid mixtures can be found in the paper by Consden et al. (1944). There are two versions of the process, the one-dimensional and the two-dimensional. The one-dimensional method uses a single strip 2 cm. wide and 45 cm. long of no. 1 Whatman filter paper and one solvent. It is easy to operate and, with liquefied phenol as the solvent, is used to detect pathological amounts of amino-acids. Fig. 1 shows the apparatus used here. In the case of urines, 25 c.mm. has been used as a routine. The urine is placed evenly from a small pipette right across the strip along a pencil line drawn about 6 cm. from the end which is to be dipped into the solvent, several applications being made, and left to dry, so that the urine is confined to as narrow an area as possible. The solvent is allowed to creep about 25 cm. past the urine line. This takes about sixteen hours. The strip is then removed, dried at 100° C, sprayed with 0·1% ninhydrin in butyl alcohol, and heated for ten minutes at 100° C. The amino-acids, if any, develop as purple bands. Normal urines vary in amino-nitrogen concentration from 10–30 mg. per 100 c.cm., as determined by formol titration (Van Slyke and Kirk 1933). They usually show two faint bands which have moved about 0·37 and 0·57 of the total distance that the solvent edge has travelled from the urine line. (This fraction is called the Rf value by Consden et al. (1944).) These bands are believed to be due one to glycine and the other to alanine. A further faint band is often seen at about 0·80. A urine with a total amino-nitrogen concentration of over 40 mg. per 100 c.cm. is easily distinguished. Fig. 2 shows developed strips from a normal urine and from a case showing progressive amino-aciduria, the Fanconi syndrome (see McCune et al. 1943). Fig. 3 shows the serial strips from a fatal case of subacute necrosis of the liver. Normal urines have been found in all cases of uncomplicated infectious hepatitis so far investigated. The colours of the ninhydrin reaction fade slowly and must be compared against standards at the time of development. For the photographs the urines were stored at 5° C over thymol and later tested and developed simultaneously.

The two-dimensional technique is more tedious but makes possible the identification of the amino-acids. Its use can be restricted to those fluids already sorted out as of potential interest by the strip method. The spot of liquid to be tested is placed near one corner of a large square of no. 1 Whatman filter paper (22 in. × 18 in.), and an adjacent entire edge of the paper is dipped into the first solvent. The cabinet required for this process will take two squares at a time and is described fully in the original paper (Consden et al. 1944). It must be emphasised that the cabinet should be kept at a constant temperature as far as possible during the development of a chromatogram. A small inside room has been found suitable here. The amino-acids are thus drawn out into a row of spots exactly as in the one-dimensional method. The paper is then dried and turned through a right angle, and the other adjacent edge is dipped into the second solvent. This moves the amino-acids in a direction at right angles; and, when the two solvents have very different properties, two amino-acids moved at the same speed by the first solvent may be separated by the second. All the amino-acids are thus separated from each other on the face of the paper and are developed visibly as before.

The two-dimensional method is also applicable to biological fluids. Fig. 4 is a diagram of the position of the amino-acids on the partition chromatogram made from 25 c.mm. of urine from a case of Fanconi syndrome. The amino-acids were identified by measuring their rates of movement in each solvent, the rates being characteristic for the amino-acids in question. A rough quantitative estimate of each amino-acid can be made by matching the size and intensity of the developed ninhydrin reaction with a known amount of the same pure amino-acid, run on the two-dimensional chromatogram and otherwise treated in exactly the same way as the unknown mixture. This procedure is necessary, as the strength of the colour reaction differs widely in an unpredictable way for equimolecular amounts of different amino-acids.

SPECIFICITY OF METHOD

The ninhydrin reaction as used above is practically specific for amino-acids and polypeptides. Some ammonium salts may give weak colours with ninhydrin (Cherbuliez and Herzenstein 1934), and where any of these are likely to be present they should be tried on the chromatogram to see how they move in the various solvents. The salts of the simpler organic acids (acetic, lactic) do not appear to interfere. Most other substances reported to react with ninhydrin (Copley 1941) are unlikely to occur in body fluids. The only serious confusion likely to

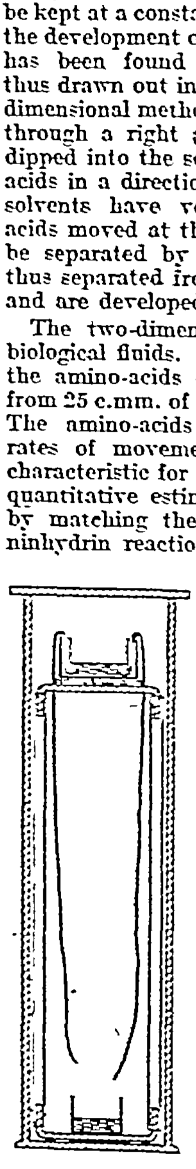


Fig. 1—Apparatus for one-dimensional chromatogram. It is contained in a glass specimen-jar 18 in. × 5 in. × 4½ in. fitted with a close-fitting glass lid. A staining trough 3½ in. × 2½ in. × 1½ in. contains the solvent (usually phenol) and stands on a glass plate on a support made of glass rod standing on legs of glass tubing. One end of the paper strip is dipped into the trough and held in position by a glass slide. The paper hanging down cannot adhere to the side of the trough, as the glass plate juts out a little way. A beaker below contains phenol and water to keep the atmosphere saturated and prevent evaporation from the strips. The apparatus will take six strips at a time.

ANALYSIS OF CASES OF ICTERUS GRAVIS NEONATORUM TREATED BY BLOOD-TRANSFUSION

Case	Parental blood-groups			Siblings	End-result
	Parent	Pheno-type	Geno-type		
1	F. M.	B, Rh +ve A, Rh −ve	B, R_1R_1 A_1rr	1st child normal 2nd child died of jaundice within a week 3rd child icterus gravis	Imbecile
2	F. M.	A, Rh +ve A, Rh −ve	$A_1R_1R_1$ A_1rr	1st to 5th children normal 6th child died of jaundice—kernicterus at 4th month 7th child erythroblastæmia neonatorum	Normal healthy child
3	F. M.	O, Rh +ve A, Rh −ve	O, R_1R_1 A_1rr	1st child well and healthy 2nd child erythroblastæmia neonatorum	Normal healthy child
4 & 5	F. M.	A, Rh +ve O, Rh +ve	$A_1R_1R_1$ O, R_1R_1	1st child stillborn (anencephalic) 2nd child, miscarriage at 3 months 3rd and 4th sibs twins, both showing erythroblastosis	One twin normal, the other spastic and backward
6	F. M.	A, Rh +ve B, Rh −ve	A_1Rr B, rr	1st child normal 2nd child slight jaundice 3rd child icterus gravis	Suspected of spasticity and backwardness

All mothers except 4 and 5 (twins) had anti-rhesus antibody in varying amount in their sera. In 4 and 5 it was suggested (1944) that "some irregular agglutinin of the St type may be the culprit." One would also point to the high percentage of the homozygote father, there being one heterozygote father in this series.

F. = father ; M. = mother.

disturbance of the hæmopoietic system, which seems to have taken the full brunt of the toxin. The film shows a high percentage of nucleated and immature red cells; early and late erythroblasts and normoblasts form a high percentage of the cells; and there are usually macrocytosis and polychromasia. The red-cell count is low; so also is the Hb percentage. It is undesirable to include all groups under either icterus gravis or hæmolytic disease, because not all cases are hæmolytic, nor are all cases severely jaundiced.

On the preventive side little or nothing so far has been done to prevent the occurrence of these catastrophes in the affected newborn. If, in the future, "a polysaccharide responsible for the specificity of the rhesus antigen can be isolated, its injection into the mother may neutralise the antibody and prevent or diminish its harmful effects on the fœtus" (Taylor and Race 1944a). Or is the answer to prevention to come on the day when an individual will be better known by his blood type than by his fingerprints, and marriages considered in terms of compatibility of blood genotypes rather than of temperament ?

TREATMENT

So far as present knowledge is concerned, the only treatment offering survival of the affected child is transfusion with group-O rhesus-negative blood until such time as the exact nature of the offending antibody has been ascertained, which can only be done in a laboratory fully acquainted with the complex subject. Whitby (1942) has written that "the homologous blood-transfusion is the ideal tissue graft," but one has to be certain that it is homologous. "The genes for the various blood groups and secretion appear to be in different chromosomes and so provide linkage markers for five (excluding sex) of the 24 pairs of chromosomes, whilst the characters themselves permit the division into a very large number of types thus: ABO × MN × Rh × P × secretion is 6 × 3 × 11 × 2 × 2, equalling 792 types" (Taylor and Race 1944b). Though all types are not important in deciding the appropriate blood required, it is becom increasingly evident that the exact nature of the offend antibody has to be investigated.

So far I have used group-O rhesus-negative blood t such time as I have had an exact report, the amount blood being 10–20 c.cm. per lb. of body-weight, vary according to the blood requirements. The affected ba is also artificially fed, as the antibody may be secreted the mother's milk. This treatment is also recommend where hæmolytic disease is due to iso-immunisation b an antigen other than rhesus.

Finally, to revert to the question of what can be offer to the parents of the affected child. It seems to me th only the cases of true erythroblastæmia are amenable t treatment by blood-transfusion, and here it must b remembered that transfusion per se is not a cure f erythroblastæmia. "It does not prevent the hæmoly of the child's own cells, it merely provides cells that w not be destroyed more rapidly than normal, and on whic the child can live until the lytic process ends" (Tayl and Race 1944a).

And what are we to do with the child that clinicall appears to be a definite candidate for the dread ker icterus, and destined to be affected one way or anothe from backwardness and spasticity to imbecility ?

SUMMARY

The end-results of treatment by blood-transfusion o six infants suffering from icterus gravis neonatorum a given. It is suggested that the offending antigens a antibodies are still imperfectly understood, and mor research is required.

It seems that the results are satisfactory in tru erythroblastæmia only. In the "toxic jaundice" typ there is grave risk that if the child recovers it will b faulty to the point of imbecility.

A fresh nomenclature and a more detailed patholog seem desirable.

ADDENDUM

Since this article was written Coombs et al. (194 have described a test for the detection of the in-vi sensitisation by maternal Rh antibody of the red cel of infants with hæmolytic disease, and have found thereb an antigen and its antibody of a type previou unknown. Their case 15, where the child died of jaund without anæmia and where the direct test was negati seems to confirm that the true pathology of the disea or diseases has not yet been elucidated.

The blood examinations in all my cases were perform by the Galton Serum Laboratory Unit at Cambridge, a I am indebted to the late Dr. G. L. Taylor, of th laboratory, who initiated me into the intricacies of t rhesus factor and supplied me with literature on the subje and to Dr. R. R. Race who has carried on this help.

REFERENCES

Callender, S., Race, R. R., Paykoç, Z. V. (1945) *Brit. med. J.* ii,
Coombs, R. R. A., Mourant, A. E., Race, R. R. (1946) *Lancet*, i, 2
McCall, A. J., Race, R. R., Taylor, G. L. (1944) *Ibid*, i, 214.
Taylor, G. L., Race, R. R. (1944a) *Med. Pr.* 211, 86.
— — (1944b) *Brit. med. Bull.* 2, 160.
Whitby, L. E. H. (1942) *Lancet*, i, 581.

AFTER a lapse of six years, publication has been resum of the Paris journal, *Annales de Médecine*. It was publish regularly every month during the war of 1914–18 but t German occupation in 1940 was too much for it. The edito say that they preferred silence to servitude under an arbitra and oppressive censorship. They are publishing four issu this year and hope to begin regular monthly publication ne year.

Another journal to come to life again after six years of w is *Rivista di Medicina Aeronautica*, published in Rome. Th present issue, for January–June, 1946, carries a suppleme containing a list (with titles also in English, French, an Spanish) of papers on aviation medicine published in Italy i 1940–46.

stine and methionine, have been found to excrete a rge excess of amino-acids in the urine. Even if only) c.mm. is available from the bladder post-mortem, this ample for both the one- and two-dimensional techiques to be applied. Bile pigments do not appear to terfere.

Many other applications to diseases of metabolic origin an be surmised. An opportunity to test the urine from case of acute yellow atrophy has not arisen.

SUMMARY

A simple method is described for detecting an excess f amino-acids in various body fluids. The aminocids can be identified with certainty by an elaboration f the method, which also allows of a rough quantitative stimate.

I thank Prof. A. C. Chibnall and his department for valuable dvice, and Prof. H. P. Himsworth and Dr. D. Hunter for roviding rare pathological material.

REFERENCES

herbuliez, E., Herzenstein, A. (1934) *Helv. chim. Acta*, 17, 1440.
onsden, R., Gordon, A. H., Martin, A. J. P. (1944) *Biochem. J.* 38, 224.
opley, G. N. (1941) *Analyst*, 66, 492.
ordon, A. H., Martin, A. J. P., Synge, R. L. M. (1943) *Biochem. J.* 37, Proc. xiii.
cCune, D. J., Mason, H. H., Clarke, H. T. (1943) *Amer. J. Dis. Child.* 65, 81.
an Slyke, D. D., Kirk, E. (1933) *J. biol. Chem.* 102, 651.

LEUCOTOMY TECHNIQUE

D. G. DUFF
M.C., M.B. Edin., F.R.C.S.E.
URGEON-SUPERINTENDENT, BELFORD HOSPITAL, FORT WILLIAM;
LATELY CONSULTING SURGEON TO NORTH WALES
COUNTIES MENTAL HOSPITAL, DENBIGH

THOSE with much experience of frontal leucotomy ill agree that, in well-chosen cases, the results, so far s we can see, can be remarkably good, if not easily xplicable. Hopeless and miserable misfits of social life, who for years have resisted all other methods, may be nade happy and useful members of the community.

Leucotomy is without doubt often performed with esitancy and inadequacy, and without very definite nowledge of the exact plane of section or the amount f white matter cut (Meyer and Beck 1945). The immeiate risk of the operation is hæmorrhage due to blindly utting across cerebral vessels which vary in position. Examination of frontal lobe sections (fig. 1) will show he wide variation in grey-matter conformation, not only etween different individuals and sexes but also between he two hemispheres of the same person.

In 1942, using the Moniz method of trephining on either ide of the bregma, I found that a curved probe-pointed istoury could section the frontal white matter very thoroughly, but there was a risk of severing branches of the anterior cerebral artery in the longitudinal fissure as well as vessels deep in the sulci on the exterior of the erebrum.

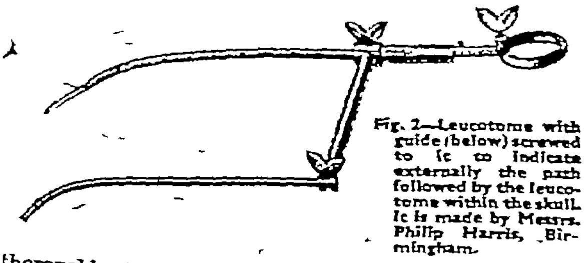


Fig. 2—Leucotome with guide (below) screwed to it to indicate externally the path followed by the leucotome within the skull. It is made by Messrs. Philip Harris, Birmingham.

Later, a sabre-shaped leucotome was given blunt dges which would not cut vessels, though they went easily through brain tissue. It was made as a cannula to give information should the lateral ventricle be punctured, for the optimal plane of section is agreed to be just in front of the anterior horn. A loop of snare wire was made to project from the cannula end (fig. 2). This was meant to cut closely under, or even into, the grey matter where the risk of cutting vessels was greatest. The wire is just sufficiently resilient to be deflected on meeting the tougher resistance of vessels big enough to bleed, but to resume its cutting once the obstruction is overcome. A centimetre scale was marked on this "cannula-leucotome." Satisfactory results were obtained, and over 30 cases have since been done without the least fear of intracranial hæmorrhage.

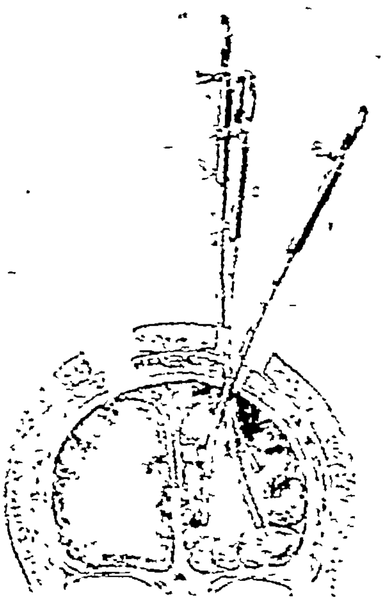


Fig. 1—Coronal section of frontal lobes, showing wide variations in cerebral anatomy of two hemispheres (drawn from different brains) and method of using leucotome: (1), (2), and (3) indicate successive positions of leucotome cutting at the site of election. (1) Leucotome approaching the falx cerebri in the longitudinal fissure; (2) leucotome swept outwards; (3) leucotome withdrawn upwards. Some brain sections show even more intrusion of grey matter and blood-vessels than that illustrated on the left side. (For clarity the guide is omitted.)

Local anæsthesia has as a rule been used, and with suitable premedication the patients are usually coöperative and unworried about the operation. Trephining has often a soporific effect.

TECHNIQUE

Some landmarks are marked on the shaven head with gentian violet—viz., the glabella; the midline point 13 cm. behind this (Freeman and Watts 1942), which is often the bregma; the orbital process of the frontal bone; a point a third of the way back from the nasion to the external auditory meatus (a calliper is used); and the upper margin of the zygomatic arch. To determine the mid-point of the vertex is not always easy, for even control measurements from the zygomatic arch on each side may be inaccurate owing to skull asymmetry. (A suitably nicked wire hoop is used.)

A bradawl is pushed through the anæsthetised scalp 3 cm. on either side of the bregma, and the skull thus pitted for the subsequent reception of the central pin of the ½-in. trephine or burr. An incision 3·5 cm. long is now made sagitally through the puncture mark, the pericranium stripped back, and the self-retaining retractor inserted. The trephine is operated with a brace; and, when the bone button is removed, a puncture place near the centre of the exposed dura is chosen which will provoke the least meningeal hæmorrhage—for this could prove more time-consuming than all the rest of the operation.

With snare wire fully retracted into the leucotome, this is pushed down through the frontal lobe till it touches the orbital plate of the frontal bone. It is kept just anterior to the plane a third of the way back from the nasion to the external auditory meatus, for this is ordinarily just in front of the anterior horn of the ventricle, which may reach forward to a plane half-way arise is in the case of simple di- and tri-peptides. This is a possible source of error in the identification of an amino-acid, and it should be suspected when a spot is found in an unusual position. The permanence of a spot after hydrolysis to break up the polypeptides would then have to be investigated.

Consden et al. (1944) have dealt fully with the question of the constancy of the position of the spots when pure amino-acid mixtures or protein hydrolysates are separated on the chromatogram. It only remains to illustrate how this has been confirmed for the amino-acids already identified in urines. Five separate two-dimensional chromatograms on three different urines from the same patient gave Rf values in phenol differing by not more than 5% for the amino-acids glycine, alanine, serine, threonine, and tyrosine and for a few other spots due to amino-acids not yet finally identified. The Rf values in collidine were more variable, up to 25%, but this could be largely related to the temperature at which the chromatogram was run, faster speeds being consistently obtained with lower temperatures and vice versa. The positions of the bands on the one-dimensional chromatogram were also constant among themselves, but by following the technique described here the Rf values were not closely comparable with those on the two-dimensional method. For instance the Rf value in phenol for glycine averages 0·37 on the former and 0·42 on the latter, a difference of 12%.

As an illustration of the method of identification of amino-acids, a urine from a case of Fanconi syndrome can be mentioned. This urine gave always four strong spots on the two-dimensional chromatogram roughly appearing in the positions expected for glycine, alanine, serine, and threonine. By trial and error it was found that a synthetic mixture containing 8 µg., 6 µg., 3 µg., and 5 µg. respectively of these acids closely matched in size and strength the spots obtained from 25 c.mm. of the urine. This, therefore, also gave a rough estimate of the concentrations of the amino-acids in the urine. The corresponding Rf values are given below:

		Phenol	Collidine
Glycine	in urine	0·43	0·22
Alanine	,, ,,	0·62	0·26
Serine	,, ,,	0·34	0·27
Threonine	,, ,,	0·53	0·30
Glycine	in synthetic mixture	0·42	0·22
Alanine	,, ,,	0·62	0·25
Serine	,, ,,	0·35	0·25
Threonine	,, ,,	0·50	0·30

These figures leave little doubt about the identity of the amino-acids in the urine, nor could the other urinary constituents have interfered in any way with the development of the chromatogram. However, it must be emphasised that, in view of the temperature effect and other variables, the synthetic mixture must always be run simultaneously in the same cabinet with the unknown. Some of the Rf values in the table above do not agree closely with those quoted by Consden et al. (1944).

Many other ways of confirming the identity of a doubtful spot could be tried—e.g., the addition of known "marker" amino-acids to the urine, and the removal of a spot from the chromatogram after specific precipitation of the amino-acid from the urine or after its destruction by a specific enzyme.

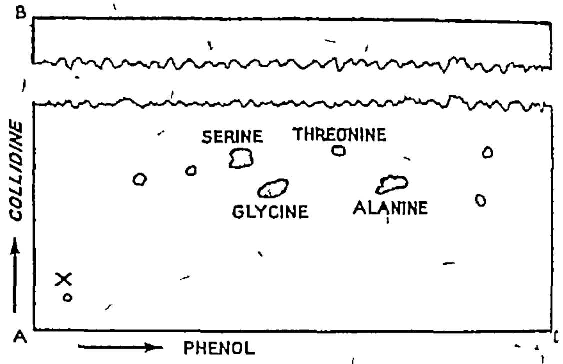
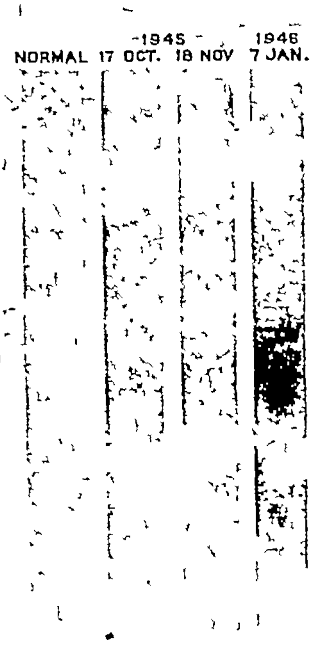
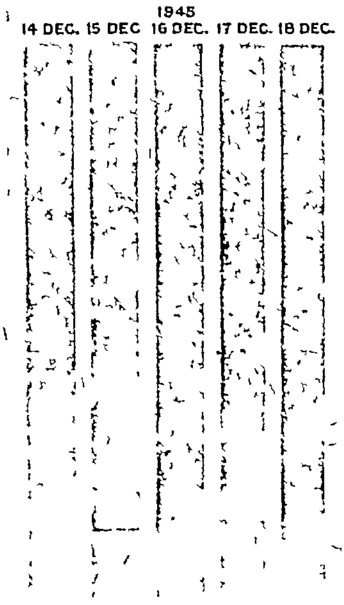


Fig. 4—Diagram of a developed two-dimensional chromatogram fr the urine of a fatal case of Fanconi syndrome complicated by carcinoma of the liver with widespread secondaries. The urine wa placed on the circle (x) at the left-hand corner. The edge AB wa dipped in phenol and the test run for 46 hr. After drying, the edge AC was dipped in collidine and run for 53 hr. The four strongest spots have been identified as shown. The remaining weaker spots are not yet identified. The amino-nitrogen concentration in the urine was 38 mg. per 100 c.cm.



2



3

Fig. 2—Developed strips showing the amino-acids in the form of bands. The upper line shows where the urine was placed, the lower line marks the limit of phenol movement. The first strip is typical of a normal urine (amino-nitrogen concentration 13 mg. per 100 c.cm.). The next three strips are from a patient with progressive amino-aciduria (Fanconi syndrome) and were passed on the dates shown (amino-nitrogen concentration 46, 44, and 112 mg. per 100 c.cm, total 24-hr. output of amino-nitrogen 740, 910, and 1480 mg.).

Fig. 3—Developed strips from a case of subacute necrosis of the liver admitted with severe jaundice and ascites on Nov. 30, 1945. The urine then gave a normal chromatogram. On Dec. 6 the amino-acids were stronger but still judged within the normal range. The urines of last few days all containing a pathological excess of amino-acids are shown above. The patient died on Dec. 19 in coma. No tyrosine or leucine crystals were seen on microscopical examination of the urines.

OTHER USEFUL APPLICATIONS

The strip method has been used to dete casein hydrolysate in the diarrhœa stool of patient receiving oral therapy at Belsen. was estimated that a large proportion passing through the gut unabsorbed.

Study of cystinuric urine (from a case Mr. F. J. F. Barrington's) suggests that th strip method would be of diagnostic value this condition.

Serum and ascitic fluid can be run on th two-dimensional chromatogram, provided tha the proteins are precipitated by ten times th volume of alcohol, followed by final concen tration on the water-bath to an amino-nitroge content of about 50 mg. per 100 c.cm. Th involves a concentration to about a tenth the original volume of serum or ascitic fluid.

The method is particularly suitable experimental work. Rats with acute necros of the liver, brought on by a diet low ystine and methionine, have been found to excrete a rge excess of amino-acids in the urine. Even if only 0 c.mm. is available from the bladder post-mortem, this s ample for both the one- and two-dimensional techniques to be applied. Bile pigments do not appear to nterfere.

Many other applications to diseases of metabolic origin an be surmised. An opportunity to test the urine from a case of acute yellow atrophy has not arisen.

SUMMARY

A simple method is described for detecting an excess of amino-acids in various body fluids. The amino-acids can be identified with certainty by an elaboration of the method, which also allows of a rough quantitative estimate.

I thank Prof. A. C. Chibnall and his department for valuable advice, and Prof. H. P. Himsworth and Dr. D. Hunter for providing rare pathological material.

REFERENCES

Cherbuliez, E., Herzenstein, A. (1934) *Helv. chim. Acta*, 17, 1440.
Consden, R., Gordon, A. H., Martin, A. J. P. (1944) *Biochem. J.* 38, 224
Copley, G. N. (1941) *Analyst*, 66, 492.
Gordon, A. H., Martin, A. J. P., Synge, R. L. M. (1943) *Biochem. J.* 37, Proc. xiii.
McCune, D. J., Mason, H. H., Clarke, H. T. (1943) *Amer. J. Dis. Child.* 65, 81.
Van Slyke, D. D., Kirk, E. (1933) *J. biol. Chem.* 102, 651.

LEUCOTOMY TECHNIQUE

D. G. Duff
M.C., M.B. Edin., F.R.C.S.E.
SURGEON-SUPERINTENDENT, BELFORD HOSPITAL, FORT WILLIAM;
LATELY CONSULTING SURGEON TO NORTH WALES
COUNTIES MENTAL HOSPITAL, DENBIGH

THOSE with much experience of frontal leucotomy will agree that, in well-chosen cases, the results, so far as we can see, can be remarkably good, if not easily explicable. Hopeless and miserable misfits of social life, who for years have resisted all other methods, may be made happy and useful members of the community.

Leucotomy is without doubt often performed with hesitancy and inadequacy, and without very definite knowledge of the exact plane of section or the amount of white matter cut (Meyer and Beck 1945). The immediate risk of the operation is hæmorrhage due to blindly cutting across cerebral vessels which vary in position. Examination of frontal lobe sections (fig. 1) will show the wide variation in grey-matter conformation, not only between different individuals and sexes but also between the two hemispheres of the same person.

In 1942, using the Moniz method of trephining on either side of the bregma, I found that a curved probe-pointed bistoury could section the frontal white matter very thoroughly, but there was a risk of severing branches of the anterior cerebral artery in the longitudinal fissure as well as vessels deep in the sulci on the exterior of the cerebrum.

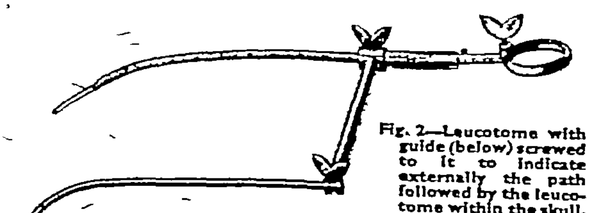


Fig. 2—Leucotome with guide (below) screwed to it to indicate externally the path followed by the leucotome within the skull. It is made by Messrs. Philip Harris, Birmingham.

Later, a sabre-shaped leucotome was given blunt edges which would not cut vessels, though they went easily through brain tissue. It was made as a cannula to give information should the lateral ventricle be punctured, for the optimal plane of section is agreed to be just in front of the anterior horn. A loop of snare wire was made to project from the cannula end (fig. 2). This was meant to cut closely under, or even into, the grey matter where the risk of cutting vessels was greatest. The wire is just sufficiently resilient to be deflected on meeting the tougher resistance of vessels big enough to bleed, but to resume its cutting once the obstruction is overcome. A centimetre scale was marked on this "cannula-leucotome." Satisfactory results were obtained, and over 30 cases have since been done without the least fear of intracranial hæmorrhage.

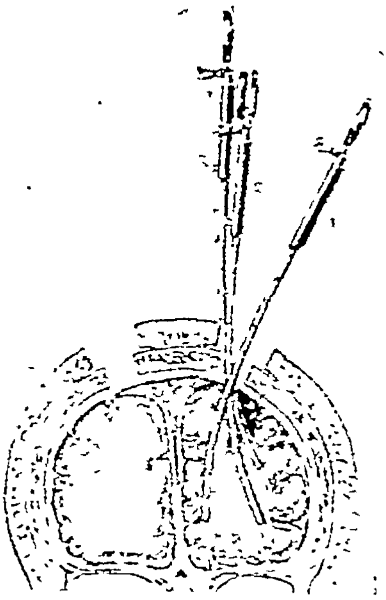


Fig. 1—Coronal section of frontal lobes, showing wide variations in cerebral anatomy of two hemispheres (drawn from different brains) and method of using leucotome: (1), (2), and (3) indicate successive positions of leucotome cutting at the site of election. (1) Leucotome approaching the falx cerebri in the longitudinal fissure; (2) leucotome swept outwards; (3) leucotome withdrawn upwards. Some brain sections show even more intrusion of grey matter and blood-vessels than that illustrated on the left side. (For clarity the guide is omitted.)

Local anæsthesia has as a rule been used, and with suitable premedication the patients are usually coöperative and unworried about the operation. Trephining has often a soporific effect.

TECHNIQUE

Some landmarks are marked on the shaven head with gentian violet—viz., the glabella; the midline point 13 cm. behind this (Freeman and Watts 1942), which is often the bregma; the orbital process of the frontal bone; a point a third of the way back from the nasion to the external auditory meatus (a calliper is used); and the upper margin of the zygomatic arch. To determine the mid-point of the vertex is not always easy, for even control measurements from the zygomatic arch on each side may be inaccurate owing to skull asymmetry. (A suitably nicked wire hoop is used.)

A bradawl is pushed through the anæsthetised scalp 3 cm. on either side of the bregma, and the skull thus pitted for the subsequent reception of the central pin of the $^1/_2$-in. trephine or burr. An incision 3·5 cm. long is now made sagitally through the puncture mark, the pericranium stripped back, and the self-retaining retractor inserted. The trephine is operated with a brace; and, when the bone button is removed, a puncture place near the centre of the exposed dura is chosen which will provoke the least meningeal hæmorrhage—for this could prove more time-consuming than all the rest of the operation.

With snare wire fully retracted into the leucotome, this is pushed down through the frontal lobe till it touches the orbital plate of the frontal bone. It is kept just anterior to the plane a third of the way back from the nasion to the external auditory meatus, for this is ordinarily just in front of the anterior horn of the ventricle, which may reach forward to a plane half-way between the nasion and the anterior clinoid processes. Should the anterior horn be punctured, fluid welling up will give the indication for reinsertion a little further forward.

The depth at which the orbital plate is reached is noted—e.g., 7–10 cm. (The bone is arched upwards.) The leucotome is withdrawn for a distance of 2 cm., and the snare wire is pushed down to project 1 cm. The leucotome is moved inwards towards the middle line, till it is judged close to the falx in the longitudinal fissure (^{1} in fig. 1). Resistance to its blunt edge is felt which will not let it go further, and the movement is done with confidence that branches of the anterior cerebral artery, even in abnormally deep sulci, will be pushed ahead and not severed.

The leucotome is now swept outwards (^{2} in fig. 1), the wire loop passing close to, or even cutting into, the thin, usually uniform layer of grey matter; the patient sometimes winces slightly as a sensitive area is touched. Occasionally sulci with contained vessels are present here, and resistance to the point is felt; the leucotome can then be withdrawn a little as required. When it is judged that the point is under the grey matter of the external surface of the brain, the instrument is gradually withdrawn upwards (^{3} in fig. 1), the snare wire being kept close under the brain surface, with the expectation that, should vessels in deeper sulci be encountered, the loop will be deflected and will not damage them.

The leucotome is removed, resterilised, and reinserted on the other side, where a similar operation is performed.

Some such technique is required to allow for the great variations in cerebral structure: differences in the extent to which grey matter intrudes on white, the depth of the sulci, the position and size of vessels, and the projection of the ventricular horn. It is expected in this way to make leucotomy (provided always that aseptic technique is faultless) no more dangerous to the patient than ordinary minor cerebral diagnostic procedures, possibly as little noxious as electric-shock therapy.

RESULTS

Detailed results of cases done with this technique will come more reasonably from the psychiatrists responsible for the patients. Only cases adjudged otherwise hopeless, of long duration, and resistant to all other treatments were treated by leucotomy. In some cases full recovery was not looked for; we hoped only for removal of suicidal, homicidal, or otherwise dangerous, destructive, or asocial habits, so that the patients should be made manageable and useful in the institution.

With this technique no death can be attributed to the operation nor has any patient been made worse. Of my 27 patients operated on since developing this technique, 4 showed practically no change, 7 are improved but still inpatients, and 15 were recovered sufficiently to resume life, and sometimes new and more responsible work, outside.

One died six weeks after operation with signs of congestion of the lung and pulmonary collapse. Necropsy showed that the white fibres of the brain had been adequately sectioned. There was no hæmorrhage, though the cut extended below to $^1/_2$ in. from the inferior aspect of the brain. In this case the superior frontal sulci penetrated $1^1/_4$ in. into the cerebrum, sulci on the medial aspect $^1/_2$ in., and those on the external aspect $^3/_4$ in., with the result that the white matter showed very irregular projections and vessels would be easily cut by a different leucotome.

Patients with signs of postencephalitic parkinsonism not only made good psychological recoveries after years of psychosis but also showed physical improvement. One with distressing symptoms of parkinsonism, chiefly unilateral, had a contralateral hemileucotomy with most satisfactory results (Schwarz 1945).

A further point must be emphasised about an operation so comparatively easy and occasionally so dramatic in its results, for it is a thrill (on occasion) to see the lines of anxiety disappear and the patient suddenly become extravert and interested for the first time in his surroundings just as the second hemisphere is cut. The decision to operate must not be influenced by the enthusiasm of the surgeon and the impatience of the relatives but must be strictly controlled by the mature experience of the institutional psychiatrist.

The work here outlined is directly due to the stimulus and encouragement of Dr. J. H. O. Roberts, medical superintendent, N. Wales Counties Mental Hospital, and to the zealous coöperation of Dr. E. Schwarz and Dr. R. S. Wilson, whose craftsmanship was so valuable in making the leucotome.

REFERENCES

Freeman, W., Watts, J. W. (1942) Psychosurgery. Springfield, U.S.A.
Meyer, A., Beck, E. (1945) *J. ment. Sci.* 91, 411.
Schwarz, E. (1945) *Ibid*, p. 503.

Medical Societies

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

At a meeting of the society on June 20, with Dr. C. M. Wenyon, F.R.S., the president, in the chair, a paper on

Researches on 'Paludrine' in Malaria

was read by Prof. N. Hamilton Fairley, F.R.S. In the south-west Pacific, he said, mepacrine had been used successfully as a suppressive drug in malaria under conditions of jungle fighting. The annual malaria-rate in Australian troops in hyperendemic areas fell from 740 per 1000 in December, 1943, to 26 per 1000 in November, 1944. At Wewak, in New Guinea, however, a definite epidemic occurred in April–July, 1945, when 23·3% of the force had overt attacks. Here a strain of *Plasmodium falciparum* relatively resistant to mepacrine existed, requiring 2 tablets of mepacrine daily for its effective suppression, compared with the normally effective dose of 1 tablet daily; in infected volunteers this was not eradicated by the standard quinine, mepacrine, and pamaquin treatment followed by maintenance doses of mepacrine. Such resistance had very rarely been observed before. This strain was, however, responsible for only a part of the malaria at Wewak, most of the malaria casualties being caused by mepacrine-susceptible strains of *P. falciparum* and *P. vivax*, while the high rate of malaria casualties in this area was due to the failure of mepacrine discipline.

During the researches on malaria chemotherapy by the Medical Research Unit of the Australian Army, some 850 healthy volunteers had been experimentally infected with malaria, and in the experimental investigations on paludrine more than 200 volunteers had been experimentally infected, while many hundreds of troops with relapsing benign tertian malaria had been treated under controlled conditions with the drug. While taking 100 mg. of paludrine daily for three weeks after being infected with *P. falciparum* by infected mosquitoes volunteers developed no symptoms of malaria, parasites never being demonstrated in their blood either by microscopic examination or by subinoculation from the seventh day onwards of 200 c.cm. of blood into fresh volunteers. The negative subinoculation results on the seventh day after infection, and the subsequent failure to develop demonstrable blood parasites or attacks of malaria when drug administration ceased, indicated destruction of parasites in the pre-erythrocytic stage. In other words, the drug was acting as a causal prophylactic in falciparum infections.

While taking 100 mg. of paludrine daily for three weeks after being infected with *P. vivax* by infected mosquitoes, volunteers similarly developed no symptoms of malaria, parasites were never demonstrated in thick blood smears, and subinoculation of blood on the ninth day did not infect volunteer recipients. After ceasing paludrine, however, all these originally infected volunteers subsequently developed delayed attacks of overt vivax malaria. It was evident that paludrine was acting only as a partial prophylactic in these benign tertian infections.

Volunteers also received as many as 130 *P. falciparum* and 120 *P. vivax* infective bites while taking 100 mg. paludrine daily. During this period they were subjected to severe stresses and strains, including (1) long marches in hilly country in a tropical climate, from 30 miles in twenty-four hours to 80 miles in three days; (2) chilling by exposure in a freezing chamber; and (3) injections of adrenaline and insulin. The daily dose of paludrine was continued for four weeks after the last exposure o infection, which covered a period of two months. hroughout the three-month period no symptoms of malaria were noted and parasites were never demon-trable in thick blood smears. Some twenty-four to hirty-three days after the last dose of paludrine, overt ivax malaria developed but never falciparum malaria.

A single dose of 50–100 mg. of paludrine, given at 8, 72, 96, and 120 hours after exposure to heavy alciparum infection, acted as a complete causal prophy-actic, but 100 mg., given three hours before or 144 hours r more after exposure to infection, did not prevent vert malaria, indicating that the pre-erythrocytic parasites were much more susceptible to paludrine than were either the sporozoites or the asexual erythrocytic parasites. In larger doses the erythrocytic parasites ould be destroyed by the schizonticidal action, but it is doubtful whether paludrine exerts any lethal action on he sporozoite.

The practical conclusion reached from this and other experiments is that paludrine in a dosage of 1 tablet (100 mg.) twice weekly, given at three or four days' nterval, will entirely prevent falciparum malaria and will effectively suppress vivax malaria throughout the period of drug administration.

Normally *P. falciparum* appears in submicroscopic quantity in the blood from the seventh day after infection by mosquito, but three or four days usually elapse before parasites are demonstrable in thick blood films. Volunteers exposed to heavy biting with falciparum-infected mosquitoes and given 100–200 mg. of paludrine from the seventh to the twenty-first day were completely cured by the schizonticidal action of the drug; subinoculation of blood on the seventh day was positive and produced in the recipients attacks of malignant tertian malaria.

When hospital patients suffering from overt attacks of falciparum malaria received a course of 100 mg. of paludrine twice daily for ten days, the clinical response was satisfactory, parasites disappeared within two days from the blood, and 104 out of 105 patients were radically cured. No other drug is as effective as paludrine in the radical cure of malignant tertian malaria.

In relapsing vivax malaria the clinical response was in no way superior to that obtained with quinine or mepacrine. Insufficient time has elapsed to assess the proportion of radical cures. A three weeks' course of the drug followed by a maintenance dose of 100 mg. twice weekly for six months is regarded as holding out the best prospect of cure.

The outstanding quality of paludrine as a schizonticide is the smallness of the dose required to resolve a clinical attack of malaria. A single tablet (100 mg.) will lead to disappearance of symptoms and to disappearance of parasites from blood smears in overt attacks of malaria caused by either *P. vivax* or *P. falciparum*.

Though clinical cure is regularly attained with 100 mg., radical cure is not to be expected and recrudescence or relapse follows in a few weeks. The possibilities of this single-dose régime, however, open up an entirely new field in the chemotherapeutic control of malaria in hyperendemic areas, not only on account of its schizonticidal effect but also because of its extraordinary potency as a causal prophylactic in single doses of 100 mg. or less, given two to six days after infection.

Gametocyte production was not primarily affected by the drug. Provided the primary wave of asexual parasites was not terminated early, the secondary gametocyte wave followed its normal curve, but if asexual parasites were eliminated in the first day or two of fever, minimal gametocyte production resulted. In other words, in both *P. falciparum* and *P. vivax* infections, paludrine acts as a secondary and not as a primary gametocide. Gametocytes taken into the stomach of a mosquito from a carrier on the first day of paludrine therapy underwent normal exflagellation and fertilisation, with the formation of travelling vermicules which penetrated the gut wall and formed oöcysts. These oöcysts, however, did not grow normally, and they degenerated. Complete sterilisation of the infection resulted in mosquitoes fed on a carrier an hour after the first dose of paludrine had been administered. When mosquitoes were fed on a carrier on the second day of paludrine administration, gametocytes failed to develop as far as the oöcyst stage; this effect continued until paludrine administration ceased and the drug was completely eliminated from the blood of the carrier. Though paludrine does not directly inhibit the formation of gametocytes or modify the microscopical appearance of those already formed, complete sterilisation of the gut infection in mosquitoes (*P. falciparum* or *P. vivax*) results when 100–150 mg. has been administered to a carrier; this effect is not irreversible but persists as long as paludrine is present in the blood.

Paludrine in vitro acts on *P. falciparum* in the pre-schizont or schizont stage, inhibiting nuclear division and producing degenerative changes in the chromatin and cytoplasm. Similar changes were found in blood smears from patients infected with *P. vivax* and treated with paludrine. Interference with some enzyme or coenzyme system controlling nuclear division may be the method by which the drug adversely affects the multiplication of asexual parasites. A similar action on early exoerythrocytic forms would explain the negative subinoculation results and failure of the erythrocytic forms to appear in the blood at the normal time in volunteers infected with sporozoite-transmitted malaria while taking paludrine.

The difference between the effective therapeutic dose and the toxic dose is very considerable. Minor and transient toxic effects have followed the administration of 1 g. daily. These consisted of troublesome vomiting, which was common, and signs of irritation of the renal tract, which was rare. A transient increase in myelocytes with a maximal rise on the seventh to ninth day was often observed with this large dose. With lower doses, such as 300 mg. daily for fourteen days, no significant toxic symptoms were observed.

DISCUSSION

The President said that the evidence brought forward strongly suggested that the difference between *P. falciparum* and *P. vivax*, from the point of view of persistence of infection, lay in differences in their respective endothelial development, the first parasite passing through only 2 or 3 endothelial cycles occupying six or seven days, whereas the second had an endothelial stage persisting for several months with an indefinite number of cycles.

Brigadier J. A. Sinton, F.R.S., emphasised the potential importance of paludrine as a suppressive antimalarial drug among indigenous semi-immune populations, in whom probably relatively small doses at weekly intervals would be efficient.

Dr. D. G. Davey felt that the chemotherapy of the exoerythrocytic forms would give the answer to the problems of malaria therapy. Experiments on these lines, however, would require an organisation such as had existed at Cairns, but this centre had now shut down. Much human suffering could be relieved if a means could be found to continue such an organisation. Paludrine was only eighteen months old and more had been discovered about it than was known about mepacrine, although the latter drug was already ten years old at the beginning of the war.

Dr. C. C. Chesterman, pointing out the importance of children as reservoirs of infection, speculated on the effect of paludrine given from birth onwards. Would such a procedure be of ultimate benefit, or might it not, through inhibiting the acquisition of individual immunity, prove just the reverse? It was proposed to examine this question in a mission in Africa.

Dr. F. Murgatroyd wondered whether combining pamaquin with paludrine had any effect on lowering the incidence of relapse in benign tertian infections, as did pamaquin combined with quinine.

Dr. H. S. Stannus remarked that the evidence that paludrine acted by interfering with the normal nuclear division of the malaria parasite might have wider implications in cancer research.

Dr. J. D. KING, asked about the toxic effects of paludrine.

Professor FAIRLEY, in reply, thought it possible that in the presence of premunity the suppressive and curative dosage of paludrine might be considerably reduced and the intervals between doses increased. Premunity was bought, however, at a great price with high infant mortality, while chronic malaria in the older age-groups produced widespread ill health. If these grave effects could not be averted while at the same time retaining the advantages of allowing premunity to develop, it might be necessary to aim at complete causal prophylaxis and radical cure of overt malaria. As regards toxicity of paludrine he said there was a remarkable latitude between the optimal dose and the toxic dose. In benign tertian infections there was evidence that pamaquin and paludrine combined were more efficacious than paludrine alone, though delayed relapses still occur after a single short course of the combined drugs.

Reviews of Books

Diagnosis and Management of the Thoracic Patient

Editor: C. P. BAILEY, M.D. London: J. B. Lippincott. Pp. 334. 24*s*.

THIS symposium of articles which is published in the "American Practitioner" series serves a useful purpose in giving a clear exposition of some of the less-known facets of chest surgery, and an interesting and up-to-date account of American practice. In the surgery of pulmonary tuberculosis the chapter on resection gives the indications and potential complications of this adventurous undertaking. The technique of bronchial closure and the after-treatment of lobectomy and pneumonectomy are well discussed. The results in 32 cases were not uniformly successful, but as this form of surgery passes from the experimental to more experienced stages improved results may be expected. Another relatively novel procedure—cavernostomy—is also discussed as a useful operation in certain forms of tuberculous cavitation. The statistical section on carcinoma of the lung contains figures on incidence, metastasis, and morbidity; in a limited number of cases treatment by extirpation gives a hope of cure.

Transthoracic approach to the upper end of the stomach has certain advantages, and the possibility of maintaining an effective anastomosis between œsophagus and stomach or intestine has now made resection of lower œsophageal or gastric growths practicable. The results show that there is a considerable future in this branch of surgery. Among the commoner forms of chest disease, more space might have been spared to the suppurative conditions. Bronchiectasis, lung abscess, and chronic empyema are considered in some of their aspects, but the deliberate omission of acute empyema presupposes a standard of treatment that is rarely achieved in practice.

A Future for Preventive Medicine

EDWARD J. STIEGLITZ, M.S., M.D., F.A.C.P. London: Oxford University Press. Pp. 73. 6*s*.

IN this provocative book Dr. Stieglitz asks for a broad conception of the scope of preventive, or constructive, medicine, and regrets that the reciprocal effects of medicine and the technical, social, economic, and political changes in American life have not been appreciated. He recognises that perfect health is an abstraction, that the benefits of purely preventive measures are demonstrable only *statistically, not individually,* and that statistics have little or no emotional appeal. Almost all our public-health activity has been directed to obstetrics, child health, and the prevention of epidemic disease; now it is imperative to cultivate the fitness of the adult population and to reduce so far as possible incapacity due to such things as nervous and mental disease, cardiovascular disease, and the arthropathies. Many causative agencies are usually at work, and he divides these into predisposing, provoking, and perpetuating. He argues that attention must not be solely concentrated on provoking factors, as in the past. Since improvements depend on the coöperation of the individual, there is ample scope for enlightened health education. P and education are, indeed, fundamental in the conception of preventive medicine, for health can become a matter of inalienable right. Dr. Stieglitz under no delusions about the limitations of a St service designed to "give" health to the people by mea of legislation. The focus of attention is usually upon th administrative machinery, and any attempt to set up super-plan to dominate the future of preventive or curative medicine en masse becomes, in his view, simply a vicious impertinence. The true responsibility of society *is to make available the means by which health may be* pursued and conserved, remembering that each citizen must accept considerable personal responsibility.

An Introduction to Clinical Perimetry

(5th ed.) H. M. TRAQUAIR, M.D., F.R.C.S.E, consulting ophthalmic surgeon, Royal Infirmary, Edinburgh. London: H. Kimpton. Pp. 330. 36*s*.

IN spite of its title this book is a fairly complete guide to the subject. From the retina to the occipital cortex, the author gives an excellent account of those lesions, whether due to injury, disease, or abnormal metabolism, which affect the visual nerve paths, and therefore produce a visual field defect which can be recorded on a perimeter or Bjerrum screen. The subject matter is *non-controversial*, and has hardly been altered at *all in this* edition, but the anatomical terminology has been brought into line with modern usage. The production of the book has been much improved since its last war-time publication, and now its lucid print and wealth of illustrations leave nothing to be desired. One would have liked to hear Mr. Traquair's views on the nutritional amblyopia seen in large numbers in prisoners from Japan and the Far East; but the author has confined himself to accepted fact, and the exact lesion in nutritional amblyopia is still in dispute.

The American Pocket Medical Dictionary

(18th ed.) W. A. NEWMAN DORLAND, A.M., M.D. Philadelphia and London: W. B. Saunders. Pp. 1061. 10

"Big Dorland" is a well-tried companion of all who need to keep abreast of technical medical language. "Little Dorland," its junior by two editions as well as in size, is a plump convenient volume which will stand comfortably on the doctor's desk beside Martindale and *Clinical Methods*. It manages, by dint of smaller type and an absence of pictures, to be nearly as informative as its senior; but it must have been intended for a capacious American pocket measuring more than $6^1/_2$ in deep and 4 in. wide, able to take a book at least $1^3/_4$ in. thick.

The Modern Treatment of Diabetes Mellitus

WILLIAM S. COLLENS, M.D., chief of the diabetic clinic, Israel Zion Hospital, Brooklyn; LOUIS C. BOAS, M.D., assistant in the clinic. Springfield, Ill.: Charles C. Thomas. Pp. 514. $8.50.

IN this year of insulin's 25th anniversary the historical introduction to this book makes delightful reading. The authors classify diabetic patients, according to the severity of their disease, into nine groups, beginning with the obese mild diabetic and ending with the diabetic in coma. The doctor is shown how to calculate a diet for each type, and the insulin dosage for each of six types of case requiring this treatment is deduced from an appropriate glucose-insulin ratio. Not all will accept the usefulness of a single theoretical criterion of this kind—particularly for the child, the insulin-resistant case, and the case in diabetic coma—and at other points in the book theoretical considerations seem to outweigh clinical observation. The traditional stomach lavage for the vomiting of diabetic *ketosis is*, for example, condemned; the separate injection of soluble and protamine insulin in place of the mixed daily dose is advocated; and the pregnant diabetic is allowed to go to term. The authors believe that, with modern management, no uncomplicated case of diabetic coma should be fatal.

While the English diabetic may note with envy the detailed analysis of foods which have long been absent from his diet, his doctor may well be thankful that a national diabetic association has secured for his patients planned rations of protein and fat which usually make it unnecessary to calculate the proportions of these and of the total calorie requirements.

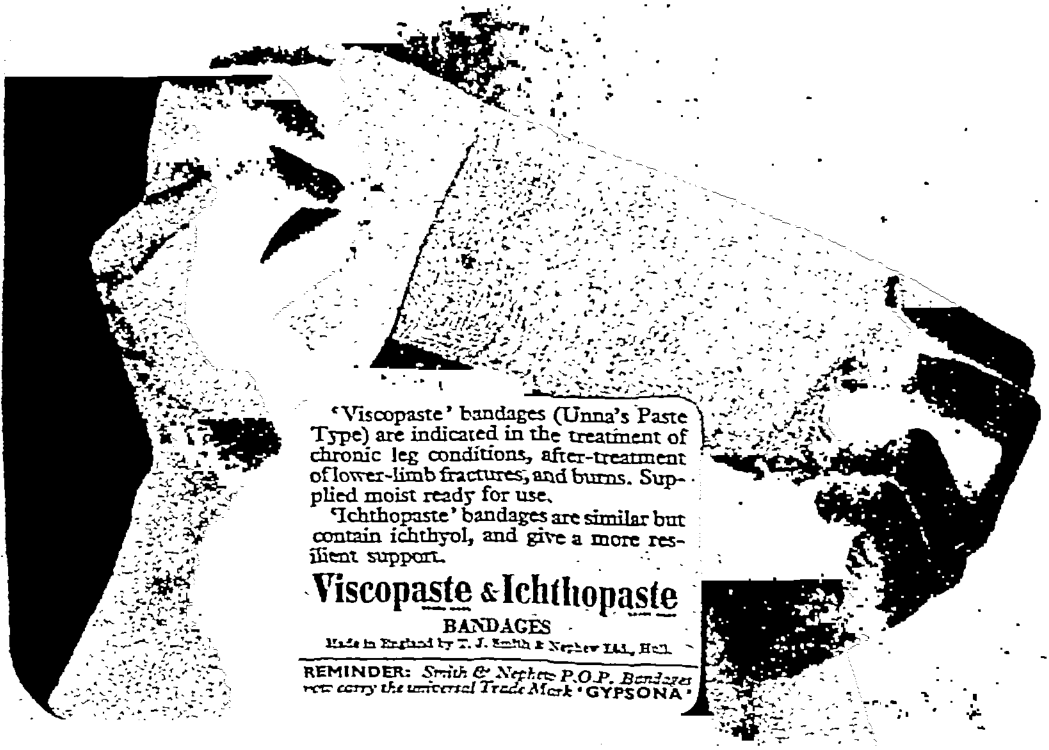
Vitamins in diseases of the nervous system

Condition	Indications	Therapeutic Agents
PERIPHERAL NEURITIS occurring in :— pregnancy diabetes alcoholism.	May indicate that the increased demand for vitamin B_1 is not being met.	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd.:** 10 mg. or more daily by mouth or hypodermically.
SCIATICA facial neuralgia.	In the absence of pathological or structural lesions of a focal nature, high doses of vitamin B_1 may prove beneficial.	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd.:** 10 to 100 mg. daily by mouth or by injection. Massive doses should be accompanied by either **BEFORTISS B complex capsules** or **BEMAX** to supply the other factors of the B complex.
HERPES ZOSTER and frontalis.	The pain of these conditions is lessened and the duration reduced by the addition of vitamin B_1 to other forms of treatment.	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd.:** 10 to 100 mg. daily by mouth or by injection.
MÉNIÈRE'S SYNDROME	Relief has been obtained from combined therapy with vitamin B_1 and nicotinic acid.	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd.:** Tablets 3 mg.—one thrice daily. **NICOTINIC ACID Vitamins Ltd.:** Tablets 50 mg.—once daily.
DEPRESSIVE PSYCHOSES	These states may be associated with a need for nicotinic acid.	**NICOTINIC ACID OR AMIDE, Vitamins Ltd.:** 50 mg. once or twice daily.

Further particulars of the various vitamin products are obtainable on request from

VITAMINS LIMITED

(Dept. L.X.J.1), Upper Mall, London, W.6.



'Viscopaste' bandages (Unna's Paste Type) are indicated in the treatment of chronic leg conditions, after-treatment of lower-limb fractures, and burns. Supplied moist ready for use.

'Ichthopaste' bandages are similar but contain ichthyol, and give a more resilient support.

Viscopaste & Ichthopaste

BANDAGES

Made in England by T. J. Smith & Nephew Ltd., Hull

REMINDER: *Smith & Nephew P.O.P. Bandages now carry the universal Trade Mark* **'GYPSONA'**

RADIOSTOL

TRADE MARK

(*VITAMIN* D_2)

Vitamin D_2 (calciferol), when sufficiently pure, may be administered in massive doses for its therapeutic effect in certain cases of arthritis and in lupus vulgaris. The purity of the product employed is of primary importance, exceptionally large doses being given in arthritis; also large doses over a considerable period are necessary in lupus. Radiostol is calciferol in highly-purified form, and it is eminently suitable for administration in high dosage.

For convenience in administration Radiostol is issued in solutions in oil containing 100,000 and 200,000 international units per gramme (for use in arthritis) and in capsules each containing 50,000 international units per gramme (for use in lupus). For routine use in the prevention and treatment of vitamin D deficiency states, Radiostol is issued in solution in oil, 3000 international units per gramme (Liq. Calciferol. B.P.) and in pellets each containing 3000 international units.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone: Clerkenwell 3000 Telegrams. Tetradome Telex London

Rs/E/483

Defence and attack—against chilblains

● Oral administration of calcium and vitamin D—as 'Ostocalcium'—is commonly used as a defensive measure against chilblains. A chilblain-free winter is quite possible when 'Ostocalcium' Tablets are taken regularly throughout the cold weather. If chilblains develop, however, parenteral therapy is more promptly effective. Injection of Colloidal Calcium with 'Ostelin' will frequently alleviate the immediate symptoms, and the parenteral attack can be consolidated by giving 'Ostocalcium' by mouth to prevent recurrence.

OSTOCALCIUM TABLETS

COLLOIDAL CALCIUM with OSTELIN

Manufacturers of
PENICILLIN

Colloidal Calcium with 'Ostelin' 6, 12 and 100 x 1 cc. ampoules 30 cc. bottles.
*'Ostocalcium' Tablets, Bottles of 50, tins of 100 and 1,000 **
**Dispensing size only*

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

THE LANCET

LONDON: SATURDAY, NOV. 2, 1946

The Basic Salary

The House of Lords has fulfilled its function dmirably in its review of the National Health ervice Bill. Some had expected the course of the ill through the Upper House to be little more than formality; but even our abridged reports suffice o show that all the many points at issue were arefully re-examined. On those chiefly concerning octors the views of the profession were ably presented and carried proper weight. The Government ere persuaded to adopt a number of useful lterations in the Bill, and by several other amendents carried against the Government's wishes he House of Lords has compelled the Minister of Health and the House of Commons to think again. The Bill as now modified will shortly go back to he Commons, and if the changes made are not accepted there a further interchange of views will take place between the two Houses. In this the Government would have reason to be conciliatory: for unless an agreed text can go for Royal Assent before the prorogation of Parliament in about a week's time, he Bill will be lost for this session. Which would almost certainly mean that the introduction of the National Health Service was postponed.

The anxiety felt so widely about the responsibilities and powers of the hospital management committees[1] found formal expression—somewhat oddly—in an amendment declaring that these committees shall have the privilege of suing and being sued in respect of contracts into which they enter. The indignation of the metropolitan boroughs of London at the transfer of so many of their functions to the local health authority (the London County Council) was endorsed by an amendment obliging the L.C.C. to delegate these functions back to the boroughs. But the Government reverse that is of greatest interest to the medical profession was on the question whether general practitioners in the new service should receive part of their income in the form of a basic salary. Accepting the advice of Lord Moran and Lord Horder, and rejecting that of Lord Addison, the House of Lords in committee decided by 53 votes to 37 that "the remuneration of medical practitioners undertaking to provide general medical service . . . shall be fixed by the capitation method except in any cases where the Minister on the recommendation of the Medical Practices Committee considers that exceptional circumstances necessitate remuneration on a different basis."

Though the payment of doctors is one of the subjects still awaiting negotiation, Mr. Bevan has made it plain that he likes the "ingenious compromise" by which every practitioner would receive (1) a basic salary and (2) a capitation fee for each patient on his list. This arrangement, which was in not much favoured among those doctors who replied to the British Medical Association's questionary two years ago,[2] has several conspicuous advantages: it is an attempt, as the Minister put it, "to introduce into the system two desirable elements—the element of security for the individual, and the element of competition in order to sweeten and refresh the service." The basic salary would give confidence and support to the young man in the difficult days before he has enough capitation fees to provide a livelihood, and by varying its amount those responsible for the service could attract practitioners to unpopular areas, could compensate them for particularly hard conditions of work, and could recognise special experience or outstanding merit. The basic salary would bring in what Lord Addison called "a better way of paying people" which does not depend on the (not always edifying) competition for patients; but it would still leave the practitioner with a strong financial incentive to succeed in that competition—to remain, as Lord Moran puts it, on his toes. Thus the Minister's compromise is, as he claims, ingenious. Lord Horder was quite right, however, in saying that the arguments in its favour have made no impression on the profession as a whole, who "have got it firmly fixed in their minds that this is the most vital spot at which the Government can attack the independence of the doctor." The call to resist conscription into a "State salaried service" is one which rightly evokes a powerful response in medical hearts, and a major cause of resistance to the present Bill is that it empowers the Minister (if Parliament will consent to his regulations) to decide whenever he likes that all practitioners in the service shall henceforth be paid by salary alone. Moreover, though much can be said for diminishing, or even abolishing, competition for patients as well as for fees, it is not really essential to the establishment of the new service that practitioners should be paid partly by salary. Alternative expedients serving the necessary purposes could be devised, even if they proved a little inconvenient: for example, entrants to practice could be given maintenance grants; and a special bonus, or a higher capitation fee, could be paid for disagreeable work, and perhaps for special experience. Meanwhile, under the Lords' amendment, the effect of basic salaries, or even the abolition of capitation fees, could be further studied in areas such as the Highlands and Islands, where exceptional conditions clearly call for exceptional treatment. The profession can be convinced only by further evidence.

Very shortly, perhaps at the end of this month, the British Medical Association will ask each one of us whether we do or do not want our representatives to enter discussions on the regulations to be made under the Bill. If those who have to answer this question had heard the debates in the House of Lords they would hesitate long before replying in the negative; for they could scarcely fail to see that the vast and complicated project in which their help is invited is based rather on recognised necessities than on the political aims of the party now in power. The principal changes made in the scheme by Mr. Bevan when he succeeded Mr. Willink as Minister of Health concern the hospital services; and it is remarkable how much support these bold changes now receive from the hospital world. Apart perhaps from the embargo on the sale of practices, about which opinions differ, the only feature of the proposed general-practitioner services on which Mr. BEVAN can fairly be accused of being doctrinaire is his inclusion of a basic salary in the remuneration of all practitioners, *whether they need it or not.* He has now been given an opportunity to withdraw gracefully from this position, and for the sake of unity we hope he will take it. We agree with Lord HORDER that, when it comes to the point, the profession will do their utmost to work this Bill "be it good or bad." But they have yet to reach that point; and their utmost will be far more valuable if, before they reach it, every removable misgiving is removed.

---

[1] See *Lancet*, July 20, p. 103; Oct. 5, p. 493.

[2] *Brit. med. J.* 1944, ii (Suppl., p. 25); see *Lancet*, 1944, ii, 213, 222.

Influenza B

IN 1940 FRANCIS and MAGILL independently described an influenza virus antigenically distinct from those encountered before. This has been christened influenza virus B—the original virus of SMITH, ANDREWES, and LAIDLAW being virus A. By retrospective examination of stored sera FRANCIS found evidence that virus B was concerned in an extensive influenza outbreak in California in 1936. Similar serological studies showed that some of the influenza present in England in the early months of 1939 was due to the same virus. Virus B has since been recognised as the cause of numerous outbreaks in North America, the West Indies, Argentine, Australia, and Britain. Clinically, influenza B seems to be indistinguishable from its fellow, influenza A. Earlier reports suggested that it had a more insidious onset and rather more catarrhal symptoms; but these differences have not proved to be constant. The disease has a more endemic character than A, turning up in minor local outbreaks but rarely causing major conflagrations. The larger mortality peaks in this country seem always to have been due to A. The Americans [1] have attempted to analyse curves of influenza periodicity on the assumption that two viruses, A and B, were responsible, A having a 2–3 year periodicity and B one of 4–6 years. There is likely to be a longer period between B outbreaks, because virus B is apparently a better antigen than A and gives a more durable immunity. In the laboratory, B viruses have hitherto been harder to isolate than A, since they do not readily produce symptoms in ferrets, and, as Dr. DUDGEON and his colleagues report on another page, may not be easily adapted to infect mice. Fortunately they can be persuaded, perhaps more easily than A viruses, to infect eggs; and Hirst's hæmagglutinin test can be readily applied to their recognition and study in the embryonic fluids of those eggs. As with virus A, there are serological varieties of virus B; but the importance of these races in epidemiology is still obscure.

The two papers in this issue should be read with this background of knowledge in mind. For the first time that we know of—and almost certainly for the first time in the last 15 years—virus B has been the main cause of a flu outbreak in this country. But, as both the papers show, its incidence has been capricious. The predilection for coloured victims, reported by Flight-Lieutenant JACKSON, is curious in view of the absence of reports from the U.S.A. of any specially heavy incidence among the negro population there. This tendency to hit part of a community heavily and another part hardly at all suggests that the conditions for its epidemic onslaught may be highly critical. If so, we may hope for much from preventive measures, whether these involve aerial hygiene or specific prophylaxis. Indeed FRANCIS and colleagues [2] have lately reported from vaccination which are more promising than hitherto recorded, and the experience of others America is said to be equally encouraging. We cannot tell yet whether such success against influenza B is due to greater antigenic potency of B vaccine or to the critical conditions necessary for its activity or to other circumstances in this particular trial.

The relation between influenza and pneumococcal pneumonia was much discussed [3] during the epidemic of 1917–18, when a purulent bronchitis sometimes leading to bronchopneumonia was the usual picture though a frank lobar pneumonia was occasionally seen. JACKSON encountered a high incidence of mild localising pneumococcal lobar pneumonia among his influenza patients in one unit in the Bahamas. The U.S. commission on acute respiratory diseases [4] has also recorded an epidemic of type I pneumococcal pneumonia in which many patients showed serological evidence of concurrent infection with virus B.

To the doctor seeing cases of influenza it does not immediately and obviously matter whether he is faced with virus A or B, or with "clinical influenza" due to neither. But to one who is studying epidemiology or attempting prevention the differentiation of this disease may be highly important.

Q Fever in Europe

THE observations made among Brisbane slaughter-house workers by DERRICK [1] in 1937 have now helped to reveal yet another cause of atypical pneumonia. He described 9 cases of a hitherto undescribed pyrexial illness in these men, and BURNET and FREEMAN [2] isolated the causative rickettsia, since known as *R. burneti*, from their blood and urine. DERRICK called this illness "Q fever," and its subsequent history has justified its intriguing name, though "Q" in fact merely stood for Queensland. In 1938 DAVIS and COX [3] in the United States reported the isolation three years previously of a filter-passing infective agent derived from the American wood-tick *Dermacentor andersoni*, in which it was hereditary. This organism was shown to be one of the rickettsias, and a case of laboratory infection with it in America ran a similar course to the Australian cases of Q fever. Careful comparison of the Australian and American strains of the *rickettsia* did not show any important difference between them, and accordingly the American name *R. diaporica*, given in allusion to the filtrability of the organism, was dropped in favour of *R. burneti*. Until recently the number of published cases was less than two hundred, of which the bulk came from Queensland, and apart from laboratory infections only one proved case had been reported in America.

In the original Brisbane outbreak the disease resembled mild typhus. The onset was sudden, with adache, malaise, fever, and pains in the limbs and ck. Headache was a constant and troublesome mptom, often interfering with sleep. The fever was mittent, usually ranging between 102° and 104° F, metimes ending by crisis between the sixth and ninth ys and sometimes by lysis after a fortnight or longer. he pulse-rate was relatively slow. Minor chest gns were noted in some cases. The Weil-Felix reac- on was negative throughout the disease, nor was ere any significant change in the blood picture. In laboratory outbreak at the National Institute of ealth, Bethesda, Maryland, patchy consolidation of e lungs, out of proportion to the physical signs, was own to be a feature of the disease. Accordingly *burneti* became recognised as an additional member f the group of agents, including various bacteria. he viruses of influenza and psittacosis, and the ungus *Coccidioides immitis*, capable of producing n "atypical pneumonia"

---

[1] *Amer. J. Hyg.* 1946, 43, 29; see *Lancet*, 1946, i, 539.

[2] Francis, T. jun., Salk, J. E., Brace, W. M. *J. Amer. med. A* 1946, 131, 275.

[3] Abrahams, A., Hallows, N. F., Eyre, J. W. H., French, I *Lancet*, 1917, ii, 377.

[4] *Science*, 1945, 102, 501.

[1] Derrick, E. H. *Med. J. Aust.* 1937, ii, 281.

[2] Burnet, F. M., Freeman, M. *Ibid*, p. 299.

[3] Davis, G. E., Cox, H. R. *Publ. Hlth Rep., Wash.* 1938, 53, 2259

Now this disease has been reported in Europe,[4] or several outbreaks of atypical pneumonia among Allied troops in Italy and Greece, as well as in Panama, were established to be Q fever. The first outbreak to be investigated was in a British paratroop regiment early in 1945, during and after their departure from Greece; the remainder were in units of the U S. Army. Several strains of rickettsia were isolated and compared with each other and with the original Australian and American strains. Complete cross-immunity existed between all of them, and, though considerable variation in sensitivity was observed in antigens prepared from the different strains, all were believed to be examples of *R. burneti*. The epidemiology of the disease remains somewhat obscure. In Australia bandicoots form the natural reservoir of the disease, which is spread among them by ticks That cattle may acquire a natural infection has been shown by complement-fixation tests, and DERRICK suggested that the slaughter-house workmen had been infected by the inhalation of dust containing dried tick excreta brought in on the hides of cattle. No reservoir of infection or arthropod vector was discovered in the Mediterranean outbreaks. The evidence there was that the disease was a "place infection" and that case-to-case spread did not occur. The affected troops for the most part occupied billets, such as farmhouses and barns, where they were in close contact with cattle, rats, mice, and pigeons and with the accumulated dust of attics and haylofts. The hypothesis that the disease was acquired by the inhalation of the dried infective excreta of arthropods was consistent with the observed facts but awaits proof. Very few of the infected men complained of bites, which is evidence against, but by no means excludes, an arthropod vector.

Thus Q fever has a much wider distribution than was previously supposed. The possibility of cases being encountered in the British Isles should be borne in mind, since the incubation period (fourteen to twenty-six days) allows ample time for the journey from the Mediterranean to England before symptoms appear; one of the outbreaks reported by the Americans occurred in troops newly arrived in Virginia after a nine days' voyage from Naples. Imported hides might also be a source of infection. Laboratory tests for Q fever should therefore be considered in obscure pyrexias and pneumonias. The final diagnosis of the disease rests in the isolation of the rickettsias by guineapig inoculation with 5 ml. of venous blood taken in the first ten days of the illness. Affected animals develop a transient pyrexia after one to two weeks. They show little change at necropsy apart from an enlargement of the spleen. The rickettsias are sought for in smears made from the cut surface of this organ, but may not be found until several animal passages have been made. The organisms grow well in the yolk-sacs of chick embryos and can be readily demonstrated there after the inoculation of infected material.

---

[4] Robbins, F. C., Ragan, C. A. *Amer. J. Hyg.* 1946, 44, 6. Robbins, F. C., Gauld, R. L., Warner, F. B. *Ibid*, p. 23. Robbins, F. C., Rustigian, R., Snyder, M. J., Smadel, J. E. *Ibid*, p. 51. Robbins, F. C., Rustigian, R. *Ibid*, p. 64. Feinstein, M., Yesner, R., Marks, J. L. *Ibid*, p. 72. Commission on Acute Respiratory Diseases, Fort Bragg, North Carolina. *Ibid*, pp. 88, 103, 110, 123. Cheney, G., Geib, W. A. *Ibid*, p. 158. Topping, N. H., Shepard, C C., Huebner, R. J. *Ibid*, p. 173.

Annotations

SIR HENRY DALE ON SECRECY

In his valedictory address as president of the Royal Society, Sir Henry Dale, O.M., a year ago spoke of the dangers arising from "security" regulations.[1] Last week he returned to the subject in a speech to the National Academy of Medical Science at Philadelphia,[2] when he suggested that war could be prevented by an international agreement not to carry on research under military secrecy. Nobody, he said, can guess how future discovery may increase the use of science as an agent of wholesale massacre; and nobody can predict what may be the result of committing the resources which produced the atom bomb to exploit other possibilities of scientific destruction. "National leaders," he continued, "may tell scientists that they must work in secrecy. We may be warned that its abandonment would make military secrets impossible and thus compromise the rights of national sovereignty. But a national sovereignty which means the right of any nation to secretly prepare the destruction of others also means the destruction of civilisation. We must tell our leaders that as scientists we are concerned not with the maintenance of military security or national sovereignty but with scientists' freedom. The universities of the world must unite in banning secrecy from their scientific work. I suggest that each nation's universities, and then the universities of all nations, should bind themselves never to accept contracts for research from the State or from industry, unless they are allowed to tell the results to the world. To the politicians I give this warning: if you insist on secrecy, many scientists will refuse to do the work involved."

CAPILLARY MICROSCOPY

PATHOLOGICAL conditions in living capillaries were first directly observed in 1879,[1] and much has since been written on the subject, but capillary microscopy of the nail-bed is still little used by clinicians, though Davis[2] points out that the technique is easy and gives no trouble or pain to the patient. Twenty-five years ago Jaensch[3] recommended that observation of the capillaries in early childhood should be a State measure, like vaccination, so convinced was he of the correlation between capillary pattern and mental development or physical disease. The government of Meresburg, Germany, was sufficiently impressed to make its school medical officers fill in a questionary on the capillary findings, psychophysical condition, and past and family histories of the pupils.

---

[1] See *Lancet*, 1945, ii, 748.
[2] Reported in the *Daily Express*, Oct. 23.

[1] Hueter, C. *Zbl. dtsch. med. Wiss.* 1879, 13, 225.
[2] Davis, E. *Amer. J. med. Sci.* 1946, 212 192.
[3] Jaensch, W., in Brugsch and Lewy's Die Biologie der Person, Berlin, 1931.

The procedure has suffered from difficulty in interpreting the microscopical appearances of the nail capillaries, especially, as Leader[4] remarks, for those of imaginative disposition. There is a very wide and varied range of the normal. Leader, and Wright and Duryee,[5] quote stunted mental and physical development, Raynaud's and Buerger's diseases, erythromelalgia, and other conditions as giving typical pictures, but such findings must still be suspected to vary with the observer. Davis emphasises the use of capillary microscopy in the discovery of petechiæ. Leader found no petechiæ in the nail-bed in patients with purpura and blood diseases, and some of the petechiæ illustrated by Davis would have been described by Wright and Duryee as mere dilatations of one or both arms of the capillary loop, but there can be little doubt that they were in fact extravasations of blood. Davis says that "petechiæ when first shed were obvious collections of red blood cells, later they became darker, and appeared as a rather homogeneous mass of pigment. If examined daily the petechiæ moved further and further away from the capillaries, and faded." In a previous paper Davis[6] gave an imposing list of conditions in which purpura had been noted. Of his 500 cases, 63% were symptomatic purpuras, and the largest categories were benign purpuras, cardiovascular diseases including congestive failure, rheumatic diseases, and bacterial infections. The degree of purpura was often very slight. In his present paper, 533 unselected patients suffering from a variety of medical conditions were examined by capillary microscopy, and 100 of them (18·4%) showed petechiæ in the nail-bed. It would be interesting to know what percentage of these petechiæ were in the arteriovenous type of capillary and what percentage in the arterial type.

More use could certainly be made of this simple investigation. Many of Davis's patients showed petechiæ in the nail-bed when no skin petechiæ were visible at any time, and in any of the numerous conditions in which purpura may be suspected the nail-bed should certainly be examined. The characteristic capillary pictures in vasomotor conditions, in preclubbing of the fingers, and in mental and physical retardation are easily memorised and sufficiently gross at times to rule out the need for imagination in their appreciation. Larger numbers of carefully observed cases must however be reported before the capillary pattern can provide a diagnosis without other stronger evidence.

FROSTED WARES

How to spread the surplus of foods during gluts over periods of famine has been mankind's problem from time immemorial. He has tried salting, pickling, smoking, drying, canning, cold storage, gas storage, and intense refrigeration, but all these processes are apt to affect both flavour and food value. Sometimes the flavour is improved, as in the canning of sardines. Usually it is changed, and even to some extent spoilt (e.g., canned apples). Rarely is the food value improved, though canners reasonably claim that the amount of vitamin C left in, say, canned asparagus or loganberries compares favourably with that of the raw materials bought on the open market and cooked at home. The ideal method of food preservation would deliver the food to the table in a state looking and tasting like the fresh material and with its food values unimpaired. The modern technique of "frosting" comes near to that ideal.

In England the technique had made some progress before the late war, when quick-frozen peas and fruits were already on the market. The impact of war brought quick freezing to a standstill, but operations were resumed in the spring of this year. In the United St the process has gone so far ahead that the housewife w likes to bake her own bread but hates the prelimina can buy frozen dough from the "stores" and only ha thaw it and put it in the oven. The American moth mustering her family for the midday meal, now cal "Get ready, everybody. Dinner's almost thawed ou Before, however, we can all enjoy the luxury of fro foods the special refrigerators must be installed by d tributors. None the less, one British firm[2] is going and soon will be offering us french beans, runner bea garden peas, and sliced cucumbers out of season much the same appearance and flavour as they wou have in season. When restrictions are removed, frost strawberries, raspberries, blackberries, and curran will be offered to the purchaser in much the same way.

The method for peas is to shell, blanch, and gra them. The blanching (which consists in heating them f $1^1/_2$ minutes to a temperature of 185° F) is necessary destroy enzymes, particularly the oxidases. The grade peas are weighed into cartons, and the wrapped carto are then passed to the air blast tunnel, where they me a current of air cooled to –35° F. On emerging from th tunnel they are stored at 0° F. Months afterwards th peas when thawed are difficult to distinguish from fres garden peas. Moreover their vitamin A is unimpaire and their vitamin C, when cooked, is much the same a that of home-cooked or of canned peas. The techniqu is young in this country and must make its way agains formidable obstacles; but in the United States, where it is older and has been encouraged rather than discouraged by war conditions, some say that it will not be long before the consumer's choice will be about equally divided between fresh, canned, and quick-frozen (i.e., frosted) foods

FIELD MARSHAL MONTGOMERY ON MORALE

IN his Lloyd Roberts lecture at the Royal Society o Medicine last Monday Lord Montgomery spoke o Morale, with Particular Reference to the British Soldie Training, he said, must from the first be directed to th selection of leaders and the infusion of discipline I battle, the characters of some grow firmer, while th characters of others are disintegrated by fear or fatigu Morale is a mental quality which maintains huma dignity and develops latent heroism; high mora draws a man forward against his own desires. It is n toughness, though tough men may occasionally perfor isolated acts of bravery.

Four basic factors are essential to high moral leadership, discipline, comradeship, and self-respec Good morale is impossible without good leaders; men are frightened at one time or another, and th they band themselves together and seek a leader. Fe makes men sluggish and indecisive, and the leade power depends on his capacity to cut through this fe paralysis by decision; the nature of the decision is le important than the fact that it is made and announc with confidence; the junior leader's greatest asset an ability to act normally in abnormal condition and to think rationally when his men have ceased think. The object of discipline is the conquest of fea whether fear attacking through the imagination as by the sight of a corpse at the roadside—or fe promoted by periods of inaction. The awareness danger, which is the basis of fear, can be partly ove come by teaching the soldier to lose his individualit and to think of himself as a member of a large bod of men, such as a battalion. To give of their best me must be united; and obedience is essential so th they comply with orders which run counter to the instincts. Discipline implies, too, a sense of duty whic for the soldier in battle, extends only to the men arou

---

4. Leader, S. D. *Amer. J. Dis. Child.* 1932, **44**, 403.
5. Wright, I. S., Duryee, A. W. *Arch. intern. Med.* 1933, **52**, 545.
6. Davis, E. *Lancet*, 1943, ii, 160.

1. *New Yorker*, August 10, 1946, p 20.
2. Crosbie-Walsh, T. *Food Manufacture*, 1946, 21, 417.

aim. From discipline is bred comradeship; war is a rough and dirty game, but not necessarily grim. Comradeship, which is based on affection and trust, fosters good will; it is a great antidote to fear. All men have a touch of nobility, and friendship causes them to give of their best; it fills a man with warmth and strength when he feels cold and weak. The fourth essential—self-respect—may grow out of the first three. It implies an attempt to maintain personal standards. Efficiency is inseparable from self-respect; and confidence grows in the man who feels he is trusted.

Devotion to a cause is not, in Field Marshal Montgomery's view, essential to high morale. "I don't believe most soldiers are influenced by causes. I think soldiers fight for reasons which have little connexion with abstract ideas." It is true, he said, that no nation can fight an unpopular war; the soldier must be convinced of the rightness of the cause, and sometimes passive acquiescence must be altered to enthusiasm by encouragement of morale. To this rule there are some exceptions; a few officers and men are deeply moved and sustained by a cause which is, for them, more important than the ordinary components of morale.

It is possible, but difficult, to have high morale without one or more contributory factors, such as success; high morale is possible in defeat but not in long periods of defeat, while success enhances confidence in leaders and the high command. Regimental tradition may help, though in battle the soldier is concerned essentially with the present rather than with the glories of the past. Domestic worries can lower morale by making a soldier think of home and all it implies. Good administration and propaganda can also help to increase morale.

There are dangers in deliberately fostering a superb morale, because the soldier comes to think not only that he can do no wrong but that his leaders also can do no wrong; but "if the British soldier's heart is steeled, there is nothing you cannot do."

CANCER OF THE CORPUS UTERI

ON Oct. 25 at a joint meeting in London of the British Institute of Radiology, the Faculty of Radiologists, and the radiological section of the Royal Society of Medicine, Prof. J. Heyman, of Stockholm, described the radium "packing" technique used for cancer of the corpus at the Radiumhemmet since 1934. The cavity of the uterus is packed with multiple small tubes containing 8 mg. of radium element enclosed in additional filters which are cylindrical in shape and of varying sizes and thicknesses. The number of radium tubes used and the size of the filters depends on the size of the uterine cavity, while the time varies according to the amount of radium used. The method is designed to deliver approximately the same dose of radiation to the uterine muscle in all cases, irrespective of the number of applicators required to pack the cavity. Two treatments are given at an interval of three weeks, and in addition one vaginal dose of radium is applied on one of these occasions.

Professor Heyman said that of every 100 cases of uterine cancer seen at the Radiumhemmet 20–25 may be cases of cancer of the corpus. When concentration of cancer cases at large centres, as is the rule in Sweden, becomes general in other countries, this greater incidence of cancer of the corpus is likely to become more apparent, and in all probability the number of technically inoperable cases presenting themselves for treatment will form a larger proportion of the whole. Formerly hysterectomy was the treatment of choice for all but very advanced cases, but treatment is now primarily by radiotherapy. When operation is combined with radiotherapy it is the radiotherapy which plays the most important part. Only in certain cases, such as cancer of the corpus associated with large uterine fibroids, is hysterectomy the primary treatment. The operation is also performed where radiotherapy has failed, and in these it is found that there is no difficulty in removing the irradiated uterus and that a subtotal hysterectomy is sufficient.

Hysterectomy, in Heyman's view, is by no means a harmless procedure in patients over fifty years of age. In all the world literature he has found only 4 reports which include as many as 100 cases treated by hysterectomy over five years ago. Among these there is a relative five-year survival-rate of 40 to 50%, the absolute five-year survival-rate not being given. From these figures it appears that hysterectomy in the treatment of cancer of the corpus is less successful than is generally taught. At the Radiumhemmet radiotherapy is established as the primary method. The packing technique has been in use since 1934 and a five-year survival-rate of 64·9% has been obtained in cases so treated. No comparison has been possible with cases treated by hysterectomy followed by deep X-ray therapy because of the lack of significant figures published. Indeed comparable groups of cases treated primarily by hysterectomy or by radiotherapy are difficult to obtain. For example, many cases thought to be operable are found to be inoperable. Similarly some of the cases regarded as inoperable and treated by radiotherapy may in fact have been operable. The position appears to be that in the early operable cases no firm conclusion as between primary radiotherapy and primary hysterectomy can be drawn. But in groups comprising cases of cancer of the corpus in various stages of the disease, the results of radiotherapy show, in Professor Heyman's opinion, a definite superiority over those of hysterectomy alone.

RHEUMATISM IN SWEDEN

Prof. J. Axel Hojer, chief medical officer to the Royal Swedish ministry of health, addressing the Heberden Society in London on Oct. 26, said that up to 1925 the policy in Sweden was to treat rheumatism at isolated units. From 1925 onwards this policy had been reversed, with increasing concentration on centres, and latterly on university centres. In 1943 15% of the population had sought medical advice for rheumatic complaints. An additional 3000 beds were needed for the treatment of rheumatism and 2000 were to be set up at once. The proposal was to allot 500 beds for acute cases and 500 for chronic cases. The other 1000 beds would be in institutions for the chronic sick and in aftercare institutions; and about 20% of the beds would be in simple buildings, designed for patients not requiring much nursing attention. These could be built at half the cost of ordinary hospitals, and would be cheaper to operate. In another ten years, altogether 14,000–20,000 beds would be needed for the treatment of chronic diseases of old age, including rheumatism; at the moment only a third of this number was available. For outpatients, the country needed additional social workers, and more rural doctors and nurses to care for patients in their homes; at present Sweden had one doctor for every 1600 of the population. He hoped that the dearth of doctors and nurses would be corrected in another 10–15 years. In Stockholm a new rheumatism research institute was to be opened soon, and a further research centre was planned for Upsala.

Sir Wilson Jameson, chief medical officer of the Ministry of Health, said that news of experience and plans in Sweden was particularly welcome here at the present time. The Empire Rheumatism Council had had a difficult, and often thankless, task. The Ministry of Health could, he suggested, contribute much to further progress, since the best hope lay in an epidemiological and clinical approach.

THE next session of the General Medical Council will open on Tuesday, Nov. 26, at 2 P.M., under the chairmanship of the president, Sir HERBERT EASON, who will deliver an address.

questionary on the capillary findings, psychophysical condition, and past and family histories of the pupils.

The procedure has suffered from difficulty in interpreting the microscopical appearances of the nail capillaries, especially, as Leader [4] remarks, for those of imaginative disposition. There is a very wide and varied range of the normal. Leader, and Wright and Duryee,[5] quote stunted mental and physical development, Raynaud's and Buerger's diseases, erythromelalgia, and other conditions as giving typical pictures, but such findings must still be suspected to vary with the observer. Davis emphasises the use of capillary microscopy in the discovery of petechiæ. Leader found no petechiæ in the nail-bed in patients with purpura and blood diseases, and some of the petechiæ illustrated by Davis would have been described by Wright and Duryee as mere dilatations of one or both arms of the capillary loop, but there can be little doubt that they were in fact extravasations of blood. Davis says that "petechiæ when first shed were obvious collections of red blood cells, later they became darker, and appeared as a rather homogeneous mass of pigment. If examined daily the petechiæ moved further and further away from the capillaries, and faded." In a previous paper Davis [6] gave an imposing list of conditions in which purpura had been noted. Of his 500 cases, 63% were symptomatic purpuras, and the largest categories were benign purpuras, cardiovascular diseases including congestive failure, rheumatic diseases, and bacterial infections. The degree of purpura was often very slight. In his present paper, 533 unselected patients suffering from a variety of medical conditions were examined by capillary microscopy, and 100 of them (18·4%) showed petechiæ in the nail-bed. It would be interesting to know what percentage of these petechiæ were in the arteriovenous type of capillary and what percentage in the arterial type.

More use could certainly be made of this simple investigation. Many of Davis's patients showed petechiæ in the nail-bed when no skin petechiæ were visible at any time, and in any of the numerous conditions in which purpura may be suspected the nail-bed should certainly be examined. The characteristic capillary pictures in vasomotor conditions, in preclubbing of the fingers, and in mental and physical retardation are easily memorised and sufficiently gross at times to rule out the need for imagination in their appreciation. Larger numbers of carefully observed cases must however be reported before the capillary pattern can provide a diagnosis without other stronger evidence.

FROSTED WARES

How to spread the surplus of foods during gluts over periods of famine has been mankind's problem from time immemorial. He has tried salting, pickling, smoking, drying, canning, cold storage, gas storage, and intense refrigeration, but all these processes are apt to affect both flavour and food value. Sometimes the flavour is improved, as in the canning of sardines. Usually it is changed, and even to some extent spoilt (e.g., canned apples). Rarely is the food value improved, though canners reasonably claim that the amount of vitamin C left in, say, canned asparagus or loganberries compares favourably with that of the raw materials bought on the open market and cooked at home. The ideal method of food preservation would deliver the food to the table in a state looking and tasting like the fresh material and with its food values unimpaired. The modern technique of "frosting" comes near to that ideal.

In England the technique had made some progress before the late war, when quick-frozen peas and fruits were already on the market. The impact of war brought quick freezing to a standstill, but operations were resumed in the spring of this year. In the United the process has gone so far ahead that the housewife likes to bake her own bread but hates the pr can buy frozen dough from the "stores" and only thaw it and put it in the oven. The American mustering her family for the midday meal, now ca "Get ready, everybody. Dinner's almost thawed. Before, however, we can all enjoy the luxury of frost foods the special refrigerators must be installed by d tributors. None the less, one British firm [2] is going and soon will be offering us french beans, runner bea garden peas, and sliced cucumbers out of season much the same appearance and flavour as they wou have in season. When restrictions are removed, frosted strawberries, raspberries, blackberries, and currants will be offered to the purchaser in much the same way.

The method for peas is to shell, blanch, and grade them. The blanching (which consists in heating them 1½ minutes to a temperature of 185° F) is necessary to destroy enzymes, particularly the oxidases. The gr peas are weighed into cartons, and the wrapped cartons are then passed to the air blast tunnel, where they meet a current of air cooled to –35° F. On emerging from the tunnel they are stored at 0° F. Months afterwards the peas when thawed are difficult to distinguish from fresh garden peas. Moreover their vitamin A is unimpaired, and their vitamin C, when cooked, is much the same as that of home-cooked or of canned peas. The technique is young in this country and must make its way against formidable obstacles; but in the United States, where it is older and has been encouraged rather than discouraged by war conditions, some say that it will not be long before the consumer's choice will be about equally divided between fresh, canned, and quick-frozen (i.e., frosted) foods

FIELD MARSHAL MONTGOMERY ON MORALE

In his Lloyd Roberts lecture at the Royal Society of Medicine last Monday Lord Montgomery spoke on Morale, with Particular Reference to the British Soldier. Training, he said, must from the first be directed to the selection of leaders and the infusion of discipline. In battle, the characters of some grow firmer, while the characters of others are disintegrated by fear or fatigue. Morale is a mental quality which maintains human dignity and develops latent heroism; high morale draws a man forward against his own desires. It is not toughness, though tough men may occasionally perform isolated acts of bravery.

Four basic factors are essential to high morale: leadership, discipline, comradeship, and self-respect. Good morale is impossible without good leaders; all men are frightened at one time or another, and then they band themselves together and seek a leader. Fear makes men sluggish and indecisive, and the leader's power depends on his capacity to cut through this fear paralysis by decision: the nature of the decision is less important than the fact that it is made and with confidence; the junior leader's greatest asset is an ability to act normally in abnormal conditions and to think rationally when his men have ceased to think. The object of discipline is the conquest of fear, whether fear attacking through the imagination—as by the sight of a corpse at the roadside—or fear promoted by periods of inaction. The awareness of danger, which is the basis of fear, can be partly overcome by teaching the soldier to lose his individuality and to think of himself as a member of a large body of men, such as a battalion. To give of their best men must be united; and obedience is essential so that they comply with orders which run counter to their instincts. Discipline implies, too, a sense of duty which, for the soldier in battle, extends only to the men around

---

[4] Leader, S. D. *Amer. J. Dis. Child.* 1932, **44**, 403.
[5] Wright, I. S., Duryee, A. W. *Arch. intern. Med.* 1933, **52**, 515.
[6] Davis, E. *Lancet*, 1943, ii, 160.

[1] *New Yorker*, August 10, 1946, p. 20.
[2] Crosbie-Walsh, T. *Food Manufacture*, 1946, 21, 417.

Special Articles

CARE OF CHILDREN

THE CURTIS REPORT

SOME 125,000 children, being deprived of a normal home life, have come within the terms of reference of the Curtis Committee.[1] This great company of children are provided for in many ways, and—in the usual British manner—according to widely differing standards. As it is with convalescent homes, with nurses in training, with hospital food, with treatment in sanatoria, so it is with children: those in authority are willing to do their best according to local custom and their own lights; but where lights are dim there are few precedents and no enthusiasm for borrowing a drop of oil from a neighbour. Thus Miss Myra Curtis and her colleagues found some children well placed and happy in good foster homes, and some cheerful and comfortable in homes, schools, and institutions; but they also found many living a dreary and stultifying life in "drab and scoured" surroundings, others overworked and weary in the service of the "home," and, worst of all, some neglected, dirty, ill-clad, and underfed, sharing workhouse wards with senile and mentally affected patients.

FORMS OF NEGLECT

If the overall picture is not as bad as it would have been a hundred years ago, yet it is a great deal worse than most of us have been complacently assuming; and it is right to repeat here some of the forms of neglect to which children are subject, including some of the worst examples, because the best safeguard against their perpetuation is well-informed public opinion.

The committee found that though nurseries for small children are often—perhaps usually—well run and well equipped, older children are likely to live in comfortless surroundings, with nothing to delight the eye, often with no convenient place to play, and with no toys or play materials, such as sand or clay. Their clothes are sometimes pleasant and individual (the sort of uniform which afflicted Rob when Mr. Dombey made a "Charitable Grinder" of him seems to have gone at last) but sometimes scanty or ugly. Their food is usually, but not always, adequate. They may be given no choice in their final career, being made, perhaps, into farm hands if they are boys, and almost inevitably into domestic workers if they are girls. Though it is often claimed that girls are "trained" in this work, in fact they may be given nothing but the dull chores, without training or responsibility in cooking or other skilled work. Owing to lack of domestic staff children in some homes are doing daily as much as four hours' domestic charing in addition to school-work.

In some homes run by religious bodies the need for relaxation is scarcely recognised, and children rise at six and go to bed at eight, spending the intervening hours in a solid round of domestic duties, school work, and religious exercises. In some girls' homes administered by a religious order 14-year-olds on leaving school are employed in the homes as laundry hands. In one case the laundry earned £85 a week by work for outside customers, while the girls seemed to be getting 2*s.* 6*d.* a week—"five shillings if they are very good."

The committee name the means of providing normal children with a home, in order of preference, as adoption, boarding-out, and institutional care. Yet one large voluntary body discourages adoption and insists on children who have been boarded out returning to the home for training in their teens—a rule naturally objectionable to good foster-parents who wish to take a share in settling "their" child in life.

Inspection should prevent serious abuses of children in homes, but the committee found repeatedly that the recommendations of inspectors had not been followed, and moreover that during the war inspection had often been desultory, years lapsing between visits.

WORKHOUSES AND HOMES

The worst examples of neglect were found children in workhouses, taken there as a tem measure, but kept there because no better quarters be—or had been—found for them.

In one century-old poor-law institution a family of normal children were sleeping on the same corridor as men and women and sharing a room with an unsightly hy- cephalic idiot. "They had been admitted in the middle of night, when their mother had left them under a hedge af eviction from their house. No plan appeared to have be made for them."

In a nursery (noted as exceptionally bad), linked with public-assistance institution, eight sick children were be nursed in a ward adjacent to the adult sick ward wh contained, among other chronic sick, a woman with advanc cancer of the face and also a child with chickenpox. Amo the sick children was a low-grade mentally defective gi who spent most of the day on a chair commode, and tw babies with rickets. The children wore cotton frocks, cotto vests, and dilapidated napkins. The room smelt foul. A premature baby had been isolated in a large very cold ward opposite. Some 16 healthy children in the same institution were living in a corrugated hutment, feeding, playing, an using their pots in a bare day-room devoid of toys. They wore dirty cotton or flannelette frocks and no knickers, and most of them had lost their shoes; their faces, but not their bodies, were clean.

Under the present law, healthy children over the age of 3 should only be received temporarily, or as an emergency measure, in public-assistance institutions; b the committee found many who had been there lon than the permitted 6 weeks, and some who had bee there for months at a time. These children were no attending school. The committee formed the opinio that in most such institutions the general care of childre was poor; the excuse offered was that good foster home are hard to find. But "the worst feature was ofte the complete failure to provide any kind of individual interest or notice."

The same weakness is found in some children's homes, whether provided by voluntary or municipal bodies. Homes are of various kinds: large *barrack* institutions left over from the last century; grouped "cottage" homes; small homes in ordinary dwelling-houses scattered through a district; and receiving homes, usually small, where children stay while permanent arrangements are being made for them. Some of the children in them are (like the children in workhouses) destitute and maintained under the poor-law, some are homeless children from evacuation areas, some physically or mentally handicapped, some in need of care or protection. Besides these children there are some, *including* war orphans, in foster homes and some in approved schools and remand homes. The ultimate responsibility for these children lies in several different departments: war orphans are the concern of the Ministry of Pensions: children cared for by local authorities come under th Ministry of Health; approved schools and remand homes, and also voluntary homes receiving public grants, are inspected by the Home Office; and voluntary homes certified as suitable for poor-law children are inspected by the Ministry of Health as well; mental defectives, most of whom are cared for by local authorities, come under the Board of Control.

REFORMS

Thus "the problem of providing for children deprived of a normal home life has not hitherto been dealt with as a single one." The committee have given much thought to devising means of simplifying and unifying the exercise of public responsibility. Such central control should apply, they think, not only *to the classes* of deprived children already recognised but to some groups who now fall outside the range of public care. These include children over 9 who have been taken der care by foster-parents for reward, children taken r foster-parents without reward, whether with a view , adoption or not, and children in voluntary homes not ow inspected by any public department. They think, ioreover, that when a child is found by a juvenile court o be in need of care or protection, from a local authority, hat authority should be obliged to accept the responsibility without having, as at present, the opportunity f refusal.

---

[1] Report of the Care of Children Committee. Cmd. 6922. H.M. Stationery Office. Pp. 195. 3*s.*

Responsibility at the departmental level, they suggest, hould lie with a children's branch of whatever department undertakes the work. This single central authority hould have "an inspectorate able to judge whether the onditions of the child's total welfare as a human being xist in a particular case." At the local-authority level he present defect is that no-one feels actively and personally responsible for the welfare of any individual hild. The report proposes that a single ad-hoc committee hould be formed with power to make recommendations and submit estimates direct to the council. Probably it would contain members experienced in public assistance, public health, and education, but it would not be subordinate to the committees in these subjects, or represent them. It would take over all the responsibilities which now fall to the councils under the poor-law, the Public Health Act, the Children and Young Persons Act, and the Adoption of Children Acts.

The welfare of the children would be directly in the hands of a specially chosen children's officer. "This," the committee affirm, "may indeed be said to be our solution of the problem referred to us." Usually, they think, this officer will be a woman, a specialist in child care, with high standing and qualifications, especially those of temperament, and with no other duties to distract her interests. Working with her should be an able staff, to each of whom she would allocate a group of children; they would be expected to act as the personal friends of these children, thus compensating them to some extent for the loss of direct parental interest and care.

It is interesting to compare this solution with that of Lady Allen of Hurtwood, made in her evidence to the committee[2] and again in the *Times* of Oct. 21. She points out that the children's officer (an unfortunate name, she considers) would be concerned only with the children —perhaps half the total number—who come under the care of the local authorities: children cared for by voluntary societies would be *outside* her scope. For such children the report suggests that "the head of an approved voluntary home" should be a suitable legal guardian; yet some voluntary homes, Lady Allen reminds us, discourage adoption and refuse to allow their children to be boarded out, though these are recognised as "the two most satisfactory methods of providing a substitute home for the majority of children." She wishes every child without a legal guardian, wherever placed, to become a ward of State by order of a court; and the State, working through local authorities or voluntary organisations, to be responsible for his proper care and upbringing.

The subject is intricate: where practice is so uneven, it is hard to see at once what should be the guiding principle. Possibly the recommendations of the Curtis Committee, if carried out, will help to prepare the way for Lady Allen's more comprehensive plan, in which the care of these children by the nation for the nation is recognised as a State rather than a local responsibility. Yet there is much in Mr. Kenneth Lindsay's view[3] that local care for local children comes nearer to the "parent" ideal which we all have in mind. In any case the issue is now clear, thanks to the painstaking work of the committee. Children are being deprived of the opportunity of normal mental, and in some cases of normal physical, growth; an immediate remedy is proposed, and should be tried.

THE PANEL CONFERENCE

THE annual conference of representatives of local medical and panel committees, held in London on Oct. 24 under the chairmanship of Dr. J. A. BROWN (Birmingham), discussed negotiations for a higher capitation fee.

MINISTER'S OFFER

Dr. E. A. GREGG, chairman of the Insurance Acts Committee, said that the committee, when it had asked for the Spens report to be implemented, had been met not with a refusal but with a proposal that discussion should include consideration of pay in another service not yet passed into law or approved by the profession. The Minister had been unwilling to listen to the argument that the I.A.C. was in no position to discuss this wider question. Finally the I.A.C., owing to the Minister's neglect to apply the terms of the report and in view of the grave inadequacy of the new 12*s.* 6*d.* capitation fee, had recommended insurance practitioners to place their resignation from the National Health Insurance service in the I.A.C.'s hands, and to authorise the I.A.C. to put in these resignations unless the Minister either applied the terms of the Spens report to the current capitation fee or referred the I.A.C.'s application to an independent body. This recommendation had been endorsed throughout the country. [Of those who replied, 95% were in favour.]

"I think," said Dr. Gregg, "that there must have been echoes of these things reaching Whitehall." The I.A.C. had received from the Ministry a further invitation, in which "some misunderstanding" was suggested. The misunderstanding, said Dr. Gregg, had been of the profession's temper. From the ensuing meeting the I.A.C.'s representatives had returned with a form of words they considered unsatisfactory; this included an offer of discussion on the factors common to current insurance remuneration and to remuneration in any future service, so as to apply the Spens Committee report to insurance remuneration. At the I.A.C.'s suggestion, the Ministry had issued another form of words:

> "The Minister is willing fully to apply the Spens report to the current capitation fee, with effect from Jan. 1, 1946, the increase of 2*s.* being regarded as a payment on account. To this end, he invites the Insurance Acts Committee to enter into discussions on the report forthwith, with special reference to the current capitation fee. The discussions will be conducted expeditiously."

Dr. R. W. COCKSHUT (London) claimed that a great victory had been won. "My only regret," he said, "is that it has taken place rather in private. Some say we must not kick a man when he's down. Why not? He's still breathing." The victory, he added, had been won not by the colleges but by the panel doctors; it was a victory for the British Medical Association.

The view of several subsequent speakers was rather that the first round had been won on points. Dr. GORDON WARD (Kent) confined his estimate of Dr. Cockshut's speech to an expression of relief that the general press was not represented at the conference. Had the I.A.C. any figure in mind for the forthcoming negotiations? The capitation fee of 15*s.* had been proposed only for a 100% service. "I should like the I.A.C. to say: 'Fifteen shillings or we go back to a special conference.'" (Cries of No!)

Dr. J. A. IRELAND (Shrewsbury) said that the 15*s.* mentioned in the Spens report did not apply at the present time; it had been based on the assumption of a 100% service and on 1939 figures, so that allowance must be made for betterment. There was no victory yet; but the Minister was in an awkward position. Speed in negotiation was vital; the profession was in a temper to resign.

Dr. GREGG said that the figure had not yet been determined; the I.A.C. was not tied to 15*s.* It was necessary to consider not only betterment but the addition, in 1942, of people with incomes up to £420 a year who normally could afford fees. He put a motion accepting the Minister's proposals, and a rider was added that it should be made clear that the words in the Minister's invitation "with special-reference to the current capitation fee" must not be construed as suggesting that the negotiators had any mandate to discuss anything relating to the future National Health Service. Rider and motion were carried without dissent. He then moved—

---

[2] See *Lancet*, July 27, p. 129. [3] *Times*, Oct. 23.

> that this conference authorises the Insurance Acts Committee to take any necessary action to secure the full and expeditious application of the Spens report to the current insurance capitation fee, such action to include, if the committee considers it necessary, the collection and use of the resignations of insurance practitioners,

and this was carried unanimously.

A Swansea motion seeking to impose a time-limit on the negotiations was defeated; and a proposal from Kent that withdrawal from the service, should it be deemed necessary, should be undertaken by national rather than by regional action was referred to the I.A.C. The conference agreed to seek the widest possible publicity for the reasons underlying its action, if withdrawal were decided on. Representatives congratulated the I.A.C. on its success so far.

THE REFERENDUM

Dr. A. **Beauchamp** (Birmingham) asked the conference to reaffirm its decision not to tolerate interference with the buying or selling of practices. Dr. **Guy Dain**, chairman of the B.M.A. council, said: "We are in a strong position. If you want to stand by your principles, you will vote [in the forthcoming referendum] against discussion of regulations with the Minister." The important simple principles were that any practitioner who wished should be able to enter the service, and that the right of appeal to the courts should be granted to doctors taken off the list. Dr. Dain quoted the example of Australia, where a Socialist design for a medical service had become a dead letter because the profession had refused to work it; but he did not want that to happen in this country. The council had decided to base the referendum on the single question, "Do you want the Negotiating Committee to discuss regulations with the Minister?" If the reply were no, the implication would be that the committee should take no further action to set up the new service until the principles had been conceded. At least two-thirds of the average doctor's income was derived from private practice; it should not be difficult, if the need arose, to maintain a reasonable standard of livelihood without the public service.

Dr. J. C. **Dixey** (Devonshire) suggested that the danger underlying a refusal to negotiate regulations was that the profession might eventually find itself in the same difficult position as that in which the Minister was now. The Birmingham motion was, however, carried unanimously.

Dr. Brown was re-elected chairman of the conference.

A SURGICAL OCCASION

CENTENARY OF THE ACADÉMIE DE CHIRURGIE

The Académie de Chirurgie of Paris, which celebrated its centenary on Oct. 9, is the successor of the Société de Chirurgie, founded in 1843, which itself succeeded the Académie Royale de Chirurgie, founded by Louis XV in 1731. Ten British surgeons, representing the Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, and the Association of Surgeons of Great Britain and Ireland, attended the celebrations in Paris, where they were the guests of the French government.

The centenary coincided with the 40th meeting of the Congrès Français de Chirurgie, which corresponds to the Association of Surgeons in this country, and on Oct. this opened at the faculty of medicine with a presi address by de Fourmestraux (Chartres), followed later a discussion on Pulmonary Embolism, led by Fonta (Strasbourg) and Redon (Paris). In the evening the British representatives were entertained to a government banquet in the magnificent rooms of the Mais des Alliés, formerly the house of Henri de Re Sir Max Page replied in French to a speech of welcome by M. Joxe, director-general of cultural relations in the ministry of foreign affairs, and two members of the delegation were presented with the honorary medal of the Académie.

On Oct. 8 a discussion at the faculty of medicine on conservation of the sphincters in operations for cancer of the rectum was opened by d'Allaines (Paris) and de Vernejoul (Marseilles), and in the evening the whole congress joined in a banquet at the Maison des Alliés. Next day the chief subject was the repair of peripheral nerves, with opening papers by Wertheimer (Lyons) and Merle d'Aubigne (Paris), and a contribution from H. J. Seddon (Oxford) and Ruth Bowden. In the afternoon the British party were received at the hôtel-de-ville by the municipal council of Paris under the presidency of Professor Basset, president of the Académie de Chirurgie, who reviewed the medical services of France and their possible developments in the future, dwelling particularly on their relations with the government. Addresses of congratulation were presented from the many countries joining in the congress, and afterwards the visitors went, as guests of the government, to the opera, where they were delighted by a superb ballet.

On Oct. 10 a sword of honour was presented to Prof. René Leriche on his admission as a member of the Institute of France. It was a happy ending to a great occasion, and all were glad to see this honour paid to one of the leaders of modern surgery. Thoughout their visit the British delegation were deeply touched by the reception accorded them by their surgical colleagues in Paris, by their generous hospitality, both public and private, and by the feeling of friendship they conveyed

CAMPAIGN AGAINST RHEUMATISM

THE NEW DEVELOPMENTS

At a reception held at Apothecaries' Hall last Monday to celebrate the tenth anniversary of the Empire Rheumatism Council, Sir **Wilson Jameson**, chief medical officer of the Ministry of Health, called on young doctors trained as general physicians to come forward and join with social workers and physiotherapists in tackling the medical, social, and economic problems of rheumatism. In the ten years since its birth the council had, he said, often and very properly been a thorn in the official flesh; it had done much to stimulate public interest and to guide medical opinion on rheumatism. Its plan for diagnostic and treatment centres, closely linked to the universities, was to be followed in general outline in the National Health Service. Centres were already functioning in London and various provincial towns, and the Nuffield trustees had made a generous grant towards putting the plan into effect. At present we did *not* know the causes of rheumatism and so could not classify cases properly; treatment was often of the hit-or-miss variety. The real aim was prevention, but the difficulties were too great to be overcome without Government help. Rheumatism was one of the big problems that the Government were to tackle in the new service. Sir Wilson Jameson deplored the lack of teaching on rheumatism in the medical schools.

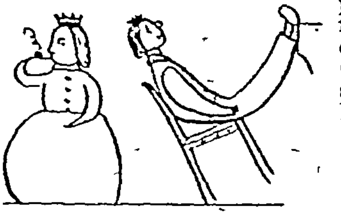
In welcoming the council's guests of honour, Lord **Horder** said that its ten years of work was at last bearing fruit. Dr. **Loring Swaim** brought greetings from the Pan-American Rheumatism Association, and Prof. J. A. **Höjer** and Dr. B. **Strandell** from the Royal Swedish ministry of health. Professor Höjer emphasised that institutes and beds were of little use in a campaign against rheumatism without the interest and coöperation of profession and public.

Ministry of Education.—Dr. J. E. A. Underwood now ranks as a principal medical officer, and Dr. R. Weaver as a senior medical officer.

In England Now

Running Commentary by Peripatetic Correspondents

AM preparing a thesis on "Character as Revealed Pipe Posture." It is not an ambitious project. To ;in with, it covers only the male segment of the population, with a few courageous exceptions, such as George Sand (when she ran out of cigars), Boadicea (in battle), Cleopatra (hookah), and Victoria (when Albert wasn't looking). Furthermore, it excludes the age-group 0–10, since rrelation of soap-bubble-pipe activity with the later d less mature fumigenetic pursuit is low. (Bubbles, ter all, are much more beautiful and much more citing than is smoke, while tobacco is considerably arer than soap.) My three character types, which rrespond vaguely with the introvert-extrovert cate-ries, are as follows:



'. . . when Albert wasn't looking . . ."

(a) The Drooper.

(b) The Jutter.

(c) The Tilter.

First, the drooper. This is a poor specimen who tempts to rationalise his feeble masseters by claiming iat it is easier to tell when one's pipe is out because ie has only to glance down into the bowl to see. This a fallacy, as a comparison of diagrams (*a*) and (*c*) ill show. A subgroup of this species smokes the pipe pside down. This is called over-compensation, a iisguided endeavour to convince the world that drooping very difficult. In a way, they are quite correct, but, s Voltaire sagely pointed out, "C'est difficile, mais ce 'est pas fumer!" referring, of course, to the fact that ie tobacco was never in the bowl of the pipe but was sually enjoying an autonomous and smouldering xistence on the front of the waistcoat. Burns of the tum 'ould be very common were it not for the fact that the rooper is usually also a drooler, a steady drip off the tem keeping the conflagration within modest limits. 'he mechanism is briefly this: the unconscious (by ind permission of C. G. Jung) neutralises the failure of he conscious via the salivary glands (by kind permission f I. P. Pavlov).

Now the jutter. This is usually a transition type: ither a drooper who is slowly integrating his personality r a tilter who is dementing.

The tilter. This posture comes easily to acromegalics nd to rear-admirals, particularly acromegalic rear-dmirals. The more erudite of my readers will have come cross the prototype of this class, one Popeye. This entleman exemplifies in full the character traits of the roup—doggedly determined in the face of overwhelming dds and underhand methods, staunchly loyal, and ommonly edentulous. Drooling is out of the question s all distillation and drainage is centripetal (by kind ermission of Sir Isaac Newton). There is only one hing to do when face to face with a foe of this description. sharp tap under the bowl of the pipe will deposit a lowing wad in the conjunctival sac of the opponent. ven should this be without effect on his composure, he nicotine will play havoc with his autonomic nerve-ndings and seriously impair his power of focusing.

* * *

Periarteritis nodosa, life-long jaundice, and leprosy vere just three of the conditions seen on a morning ound of an old poor-law infirmary which, since 1929, ias been a L.C.C. hospital; but it is not only in clinical naterial that municipal and county-council hospitals re approaching teaching-hospital standard. This round vas attended by six students, seconded for clinical raining; their coming has been acclaimed as a stimulus o thoughtful work. The staff is also well pleased to have two supernumerary ex-Service registrars—indeed, the wonder is that the work was ever done in this 500-bed institution with the normal establishment of 7 doctors, including the superintendent. But this plethora can be only transitory. Perhaps when it has passed, part-time clinical assistantships will be offered to general practitioners: their appointment would benefit the practitioner as much as the hospital; and why not give the local doctors a chance to attend clinical meetings? One complaint against the county council is the pay: an initial salary of under £800 for a resident deputy superintendent and of under £500 for a highly qualified A.M.O. cannot be counted as princely. Perhaps the council has been lucky in recruiting those who happen to believe in the form of service it offers; but even the faithful find that once married they must either quit or starve. This has resulted in a constant turnover of staff which has not made for smooth organisation; it has not been experienced in adjacent counties, where the value of professional services is assessed more generously.

* * *

This new system of medical grading in the Army is causing a lot of bother. The "good-enough-for-my-father" types are asking what was wrong with the old one. ("We won the war with it, didn't we?") The series of initial letters, each one neatly grading a bodily function, from feet (L) to eyes (EE—one for each eye), proves very confusing to those who can't remember whether L stands for Locomotion or Liver and S for Spleen or Stability. Our chief trouble has been naming the business of doing it all. Shall it be *pulheemising* or just plain (very plain) *pulheeming*. Neither is very euphonic, but pulheemising seems to have won. It sounds more distinguished to have been pulheemised than merely pulheemed. (The *s* is dropped by tacit agreement; there must be no suggestion of instability about the method even if there is about the subject.)

Like many other innovations this one has altered the meanings of a number of words. Thus a handsome profile no longer refers to a Barrymore physiognomy but rather to an unbroken series of 1's. The symbols largely remain a mystery to the uninitiated. A senior officer inquired whether it was the P or the U which recorded the results of his urine examination. Perhaps our saddest case was the Pioneer found waiting outside the M.I. room carrying a large envelope who, when asked his business, plaintively told us that he had "come to be pulverised"!

* * *

Our sub-chief is quite the most economical customer I have ever come across. It wasn't so bad when he confined himself to sticking up posters for the Ministers of Food and Fuel, but when he observed that, every time we gave a patient an electrical convulsion, some 100 volts were diverted for at least 0·3 of a second from our vital industries, I knew he wouldn't be content to leave it at that. And sure enough, the very next day he came out with his plan. We were to connect up the patient to the accompaniment of Liszt's E flat piano concerto on records. When it came to the bit where the triangle goes "ting-ting," we would press the button on the Cox-Cavendish. Next day no volts would be required. The records and Pavlov would do it all. The triangle would go "ting-ting," and, as a straightforward conditioned reflex, the patient would go tonic and clonic. The suggestion that we condition every patient in this way seemed feasible at first, till it was pointed out that the bells on our tramcars go "ting-ting" too. And before he got round to considering some other stimulus I had exposed the fallacy of the whole argument: if it were so easy to condition a reflex to the last stimulus experienced before Faraday, Galvani, and Co. asserted themselves, then all our edentulous patients should have had fits every night their wives said, "Have you taken your teeth out?" Such an incident has never come to my ears, and the whole thing provides, in my opinion, an excellent example of a theory based on a false premise. We still use the old-fashioned electrical method.

* * *

Neurosurgeon, after 6 hours of a craniotomy, "Sister, where's the clock?"

Theatre sister, "It's gone for repair, sir."

Anæsthetist, fairly sotto voce, "I shouldn't bother, Sister, stick up a calendar instead."

Letters to the Editor

THE BILL IN THE LORDS

SIR,—Few of your readers can have had the opportunity of hearing the committee stage on the Bill in the Lords; some comments from an eye-witness may therefore be of interest.

Considerable debate occurred on the relative powers of the regional hospital board and hospital management committee. Whilst it was abundantly clear that it is the wish of all parties, and the Government's intention, to decentralise to a great degree, the debate was at times quite unreal. A few clear words from the Government benches as to what was intended would have done much to disperse the miasma which continues to surround this important subject. Whilst everything reasonable should be decentralised to hospital committees, certain vital functions can only be carried out at regional level if we are to get the coördinated system we have been promised and not an anarchy of completely independent hospitals. Nor were Government speakers in possession yet of anything useful they could tell their Lordships about the delimitation of the regions. Even when the Health Bill becomes law we cannot know how the hospital service will work until these fundamentals of geography and function are made known.

The Leader of the Opposition indicated clearly that the House could only concern itself with revision—where revision was wise. It was necessary to make the Bill a better Bill. And at the committee stage some important revision was carried out. The vexed question of taking over the endowments was at last settled satisfactorily, the Government agreeing to take steps to allow the "sacred trusts" referred to by Lord Samuel to continue, and only to place endowments in a general fund when they had been given for the general upkeep of hospitals.

An important amendment that payment to practitioners should be by capitation fee only, and not partly by basic salary, was carried against the Government on the intervention of the president of the Royal College of Physicians. The persuasive and measured advocacy of Lord Moran, who was supported by Lord Horder, undoubtedly carried very great weight. Possibly not all doctors will be pleased with this amendment, but there will be complete unanimity at the stress laid by Lord Moran on the need to safeguard teaching and research in the teaching hospitals. In accepting this amendment the Lord Chancellor referred to the great authority which Lord Moran carried. Whatever be the fate of the various amendments before the Bill finally passes on to the statute-book it is clear that the Royal College of Physicians has been very worthily represented in this Council of State. By their policy of wisdom and moderation the college and its president, Lord Moran, have earned the gratitude of both the Government and the profession.

London, N.W.11. F. J. BENTLEY.

PERIODICITY OF INFLUENZA

SIR,—Last year we were warned that there was likely to be an epidemic of influenza in the winter of 1945–46. This forecast, which proved to be wrong, was no doubt based, in part at least, on the belief that the almost world-wide food scarcities and restrictions would favour such an outbreak. But was this belief justified? According to Dr. Kenneth M. Smith, of the Plant Virus Research Station at Cambridge (*Times*, June 1, 1944), "the rule that healthy organisms are more likely to stand infection than unhealthy organisms does not apply very strongly to plants and viruses." My studies of the periodicity of influenza lead me to believe that this "rule" may not apply to man and viruses either.

For the last seven years I have graphically recorded the incidence of all types of ailments among the patients in a large panel practice and I have found that every well-marked rise in the incidence of influenza is immediately preceded by a rising incidence of the common cold. This "common cold—influenza" sequence is the most striking feature of my records. Indeed so close are the two waves and so definite is their time relationship that I have come to regard them as parts of the same epidemic.

I have made another suggestive observation: well-favoured predominate among the patients the first (common cold) phase of an epidemic, the in the second (influenza) phase. Some years ago William Hamer[1] observed that during epidemics stout members of a family circle contracted colds later the slim developed influenza. But the point seems to be not merely whether patients stout or slim but whether their weight is stationary, or decreasing. My clinical observation as free from bias as I can make them—suggest that the main it is the "thrivers" who catch cold, "strivers" who develop influenza.

I have formed the hypothesis that the st of thriving favours the multiplication of organ living in the respiratory tract, thus producing the symptoms of an endogenous infection, the common col the resulting infection is spread as an exogenous infect which produces a more vigorous reaction label "influenza." If many people are thriving, and if enoug of them develop an endogenous infection at the same tim the weight of infection may be heavy enough to creat an epidemic of influenza among the strivers.

World experience of influenza during the late w supports my hypothesis. As you pointed out in yo leading article of April 13, 1946, influenza periodicity fairly stable up to 1941—the year when the world beg to tighten its belt—but since then it has been less stabl

Famine may prevail in Europe this winter. Certainly few will be well fed. In my view, however, the danger of serious epidemics of influenza is not now; it will come when the world enters the promised period of freedom from want. My observations suggest that it is in times of plenty, not during periods of privation that pandemics of influenza will occur and its periodicity be again stabilised.

If my hypothesis is true—and my own carefully collected data support it—many social scientists will have to review their premises. There is need, and opportunity, for parallel investigations by other observers. To those interested I recommend the study of sequences.

Halifax. ANDREW GARVIE

FOLIC ACID IN CŒLIAC DISEASE

SIR,—We can confirm the finding of Dr. Brody and Dr. Gore (Oct. 26) regarding the treatment of cœliac disease with folic acid. So far we have treated two cases, and in both there has been a striking clinical improvement and a reticulocyte response of over 25 % on a daily dose of only 5 mg. of folic acid. Both children, in addition to the typical clinical features, had "flat" glucose-tolerance curves and megaloblastic sternal marrows.

It is hoped to publish full details of these and other cases later; meanwhile, in view of the relative scarcity and high cost of folic acid, we feel that the efficacy of the smaller dose should be known.

H. W. DALTON.
M. L. THOMSON.
V. K. WILSON.

Royal Manchester Children's Hospital.

CONVALESCENT HOMES

SIR,—May I, as an almoner, welcome your sug of Oct. 19 that there is need for a central agency to he and advise those who are concerned with the care of th convalescent patient? The needs of the convalescent have in this country never received the degree of study and attention that they require, and, though every almoner knows of a few excellent homes, the number is totally inadequate for the need. The regulation of vacancies through a central agency is by no means the only service that such a body could offer. Much work needs to be done in thinking out questions of feeding, furnishing, occupation, medical and social records, methods of sending reports back to the source of referral—to name only a few of the questions involved The establishment of a clearing-house for informatio and advice would remove much of the confusion, duplic tion of effort, and misunderstanding that so often aris between the management of the homes and the referrin agencies. To quote from a report recently published subject by the Hospital Council of Greater New k : "The red tape, the variations in restrictions, and failure to exchange medical and social data all ound to the discomfort and sometimes the neglect of patient."[1] I venture to believe that there are many, h among those who send patients to homes and those o receive them there, who would agree with that tement and would warmly welcome a lead towards ving their many problems. **M. J. ROXBURGH.**

---

[1] *Proc. R. Soc. Med.* 1931, 24 (*Sect. Epidem.*), 53.

lmoner's Office, Middlesex Hospital, London, W.1.

YCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—In order that this correspondence may not be etracked by criticisms regarding data, I should like make the following comments. Owing to the exigency space my paper had to be severely limited, and, in rticular, tables giving in every case age, occupation, ration of symptoms, time in hospital, diagnosis, result of eatment, and period of follow-up had to be omitted.

I should also like to point out that, in this hospital, ery case is subjected to an extensive examination, and eatment is decided upon at a staff conference, when the ports of the psychiatric social workers, the psychologist, d if necessary the consulting physician, are considered relation to the psychiatrist's findings. I would stress e fact that we are not dealing with isolated cases, ferred merely for an opinion, but that we are endeavourg to cope with the vast problem of treating those fortunate members of a community of some 300,000, ho are completely crippled by psychoneurotic illness. any beneficial alterations can be effected in the home vironment, these are carried out through the agency our mental treatment department. We are completely sponsible for every patient long after he leaves spital, and no case is allowed to drift through lack accurate follow-up reports. I may add that my stateents concerning the absence of prolonged memory efects or intellectual deterioration are based on the llow-up records of over 2500 cases.

In conclusion, it may be of interest to note that, as x months have elapsed since I wrote my paper, the most cent case has now been followed up for at least fourteen onths. **W. LIDDELL MILLIGAN.**

St. James Hospital, Milton, Portsmouth.

SIR,—I have just been studying the history of sychiatry from Zilboorg's book, and I have come to the onclusion that should the value of the "intensive-lectrical-convulsive" treatment of the psychoneuroses s sponsored by the Portsmouth school be confirmed, we hall have attained one of the very greatest advances our specialty. For here were we old stagers plodding long painfully, treating our neurotics by teasing out onflicts, frustrations, and aggressions, by altering occupaons or modifying environments, when—lo and behold—e find that we have been wool-gathering, tilting at indmills, mystifying ourselves and our patients!

Apparently the difficulty of the psychoneurotic is a mple affair after all. It is merely another example of n electrical pattern in the brain gone askew; switch on e machine, change the brain-currents from anti-lockwise to clockwise, and—hey presto—the unfortunate fferer becomes happy. And what a great saving of time -ten sessions of five minutes each, as against perhaps 25 of one hour each. Instead of doubling or trebling e number of psychiatric outpatient clinics, as recomended by Dr. C. P. Blacker in his recent review (*Neurosis nd the Mental Health Services*), we can safely halve them; r analytic psychotherapy will soon become redundant, nd neurotics will be admitted direct to mental hospitals o have "all that nonsense knocked out of their heads."

And yet, is all this too good to be true? I feel that uch a radical discovery should be carefully verified in he very best research units of London, New York, and Moscow before we adopt it as a routine in all British ental hospitals.

I share Dr. J. Glaister's suspicion that we are dealing vith a serious regression in the history of the therapy of ental disorders. The fear I expressed early this year (*Brit. med. J.* 1946, i. 328) that an attempt will be made to replace long sessions of psychotherapy by short sessions of button-pressing is, alas, being fulfilled. I would stress again that the urgent social problem behind this trend is the scarcity of experienced psychotherapists.

Park Prewett Hospital, Basingstoke, Hants. **I. ATKIN.**

EPIDEMIOLOGY OF INFECTIOUS DISEASES

SIR,—One of the great problems in the epidemiology of infectious diseases is the mechanism by which infection survives through long inter-epidemic periods. Based on recent knowledge of the variability of the molecular structure of viruses the solution of this problem is here suggested.

It is noteworthy that human epidemics usually occur during a particular season of the year and that epidemic foci *often arise* simultaneously and apparently independently, suggesting some *activation* of previously acquired infection rather than direct case-to-case transmission. Shope (1943) has demonstrated that swine influenza virus, while in the lungworm, exists in a masked form and is totally non-infective until awakened to activity by some provoking stimulus. Furthermore, he maintains that the onset of a swine epizootic is determined not by the acquisition of the causative virus but by meteorological or physical conditions which favour its activation. A similar conclusion was also arrived at many years ago by Tomb and Maitra (1926) regarding the relationship of "non-agglutinating" intestinal vibrios to epidemic cholera. In an article entitled "A New Conception of the Epidemiology and Endemiology of Cholera" (1927) they wrote as follows:

> "We have therefore been driven to the unavoidable conclusion that the non-agglutinating (non-epidemic) vibrio takes on the agglutinating (epidemic) characteristic under certain biochemical-physical conditions [often seasonal] in the human intestine, the nature of which are at present unknown, and in this mutation or epidemic form is the cause of epidemic cholera. Non-agglutinating (non-epidemic) intestinal vibrios therefore in our opinion constitute the reservoir of cholera both epidemic and endemic."

In a previous article (1926) they also wrote:

> "During our investigations in the Asansol Mining Settlement [Bengal], we have met with several outbreaks of epidemic cholera in distant and isolated villages, the inhabitants of which had not been in contact either recently or remotely with any case of epidemic cholera. Spontaneous outbreaks of epidemic cholera have also been noted by other observers in other localities. Hitherto the explanation of such outbreaks has been that they owed their origin to some carrier of Koch's (infective) vibrio who existed unknown in the community. Our suggested explanation of such outbreaks now is that owing to favouring circumstances [often seasonal] the non-agglutinating (non-epidemic) vibrio changes into the agglutinating or epidemic form in one of the numerous chronic carriers of non-agglutinating vibrios in endemic areas [such as the Mining Settlement], the epidemic spreading in the usual manner by contamination of water and by contact."

The mechanism by which infectivity is increased or diminished in a virus (and by inference in bacteria also) is thus described by Fenton (1945):

> "Our best clue to the nature of gene mutations is furnished by viruses, those submicroscopic germs that cause colds, influenza, yellow fever, and a number of diseases in plants. They, too, are giant molecules containing hundreds of thousands of atoms that are linked in complex groups and series. For generations these molecules may be stable; then they abruptly change. Thus the virus which normally causes tobacco mosaic may add a few thousand atoms and become a variety that produces the much more virulent ailment known as acuba. Other modifications may cause a disease that kills the affected plant or make the virus so weak that its effects can barely be detected. Apparently a single virus strain may appear in any or all of these forms, shifting from one to another as atoms are gained or lost."

REFERENCES

Fenton, C. L. (1945) Our Living World, New York, p. 185.
Shope, R. E. (1943) *J. exp. Med.* 77, 111, 127.
Tomb, J. Walker, Maitra, G. C. (1926) *Indian med. Gaz.* November p. 537.
— — (1927) *Ibid*, February, p. 61.

Sydney, N.S.W **J. WALKER TOMB.**

---

[1] The Road to Recovery from Illness. A Study of Convalescent Homes Serving New York City. Prepared by Elizabeth G Gardiner and Francisca K. Thomas. Published by Hospital Council of Greater New York, 1945.

Parliament

THE BILL IN THE LORDS

Committee Stage Concluded

On Oct. 22 Lord Amulree moved an amendment to clause 28 in the National Health Service Bill providing that the care of old people should be placed directly under the control of the health authority. The Bill provided that all sick old people should be so cared for, and he feared that if we tried to separate old people who are sick from those who are healthy we should get into difficulties. In age the dividing line between sickness and health was small, and if there were to be any barrier between the two he thought the care of the older people would suffer. Today more and more old people had to live in institutions, and these did not come under a health authority. If, as was possible, it was found necessary to add some kind of sick quarters to these institutions there would be a danger that old people might tend to be kept there rather than removed to hospital. The Earl of Listowel said that the care of the aged who were not sick did not come within the *scope of the Bill, but he assured Lord Amulree that* it would be dealt with in forthcoming legislation which the Government intended to introduce for the abolition of the poor-law. They regarded that as among the most important social reforms which they hoped to carry out. The amendment was withdrawn.

Lord Llewellin moved an amendment to provide that medical practitioners who had to decide before the appointed day for the Bill to come into force whether they would enter the service should be given not less than three months' notice of the terms and conditions of the service. But Lord Jowitt, though in sympathy with the amendment, did not want to tie himself down in the Bill because difficulties might arise. The terms would be negotiated with representatives of the medical profession, who no doubt would keep their constituents acquainted with the matter as it proceeded. He hoped that it might be possible to give doctors more than three months' notice. Viscount Cranborne thought it difficult to leave the matter as it was in view of its extreme importance to the medical profession. The decision which *doctors would have to make would* affect the whole of their future lives, and it was only fair that Parliament should allow them adequate time for consideration. It would be an insult to the medical profession and to the skilful officials of the Ministry of Health to suggest that they could not devise terms and conditions of service in the period which would elapse before the appointed day. Lord Jowitt agreed that they ought to aim at six months' notice as a minimum, but he asked their Lordships not to put anything binding in the Bill in case there might be unexpected difficulties. He would, however, undertake to consult the Minister of Health and look at the matter again. The amendment was withdrawn.

BASIC SALARY AND CAPITATION FEE

Lord Llewellin moved to add the following subsection to clause 33 :

> The remuneration to medical practitioners undertaking to provide general medical services in pursuance of the provisions of this Act shall be fixed by the capitation method except in any cases where the Minister on the recommendation of the Medical Practices Committee considers that exceptional circumstances necessitate remuneration on a different basis.

As yet, he pointed out, no indication had been given of what proportion of the doctor's remuneration was to be by salary and what by capitation fee. He believed that the right way to remunerate the doctors was by capitation fee, though he realised there were areas where this would not be possible.

Lord Moran said that this matter had aroused the misgivings of many doctors who, like himself, were satisfied, generally speaking, with the hospital provisions of the Bill. The proposal to pay a doctor a salary required more justification than had hith been given. There could only be two reasons. it had been suggested, was that the Socialist before it came into office had seriously consider whole-time medical service with a basic salary, and the method proposed in this Bill had been adopted concession. If this was true it was not a good rea The other was a better one. It was said that any p titioner entering medicine might in his first year have financial difficulties, and that a basic salary £300–£400 a year might supply some measure of secur But was it *proposed* that the Ministry of Health go on paying doctors a basic salary *if they did* not any patients in their first year or two? On the oth hand, if the doctor got patients to the equivalent amou of the basic salary, then this measure of security wa no longer necessary. Not only was there very little to b said for a basic salary, but there was a good deal to b said for a capitation fee. In past years Lord Mor had been asked to advise the medical service of Navy and the Royal Army Medical Corps how to ob keen men, and the result of his investigations had sh that it was impossible, with many brilliant exceptions to keep men as keen in whole-time salaried service of that nature as in general practice where the competitive stimulant was present all the time. He was convinced that if there was anything approximating to a whole-time service great attention must be paid to incentive, and that was why he would like to see the whole of the remuneration paid by capitation fee and the basic salary dropped. It had been said there was something derogatory in competing for patients, but was this true? Would the Noble Lord on the Woolsack be demonstrating the development of his forensic skill, if instead of competing for briefs in his earlier years he had been the salaried servant of a corporation?

Lord Horder suggested that Mr. Bevan could do nothing more salutary, or more likely to further his happier relations with the B.M.A., than to accept this amendment. Several times during the committee stage the Government had given an assurance that there was no intention to nationalise the medical profession. But those statements might be made ad nauseam and there would still be firmly fixed in the minds of the medical profession the idea that that was the final intention of the Government and of the Ministry of Health. The doctors had not been impressed by the reasons given for part payment by a basic salary. They believed this to be the most vital spot at which the Government could attack the independence of the doctor, whether as a practitioner of medicine or as a man earning his living in a reputable fashion. To accept this amendment would assure those in charge of the Bill of a big element of extra confidence in the mind of the medical profession, and the Minister *had admitted* that without the coöperation of the doctors the scheme to fail. Lord Beveridge had said that the Bill was a one and he wanted to make it better. Lord Hor thought the Bill was a bad one, but he would like make it less bad. The doctors would do their best to work the Bill, good or bad ; they could not strike They must continue their work, and they must have State support in doing so. The doctor was *not* an altruist when he started in his profession ; he became an altruist in proportion as he *succeeded*. The medical services *in this country* had a great deal in their favour, and though it was the duty of the State to improve the machine, it was for the doctor to work the machine A willing worker would go a long way, an unwillin worker would go only a short way, and would not ev give to this health scheme the trial which it deserved.

Viscount Addison, who had been largely in char of the negotiations relating to the original capitatio lowance 30 years ago, admitted that he had been isappointed at the way in which it had worked. The hole tradition and practice of medicine was to frown n any unnecessary competition for patients, and he hought that was right; and the list system of payment ad by no means been beyond criticism, for inflated sts made detailed attention to patients difficult. It as because of the faults of the capitation system that he Government had adopted the plan in this Bill, nd not because they had any sinister designs. The ethod of payment could not be prescribed in the Act; must be left to negotiations, and he did not think it as possible to devise a system whereby payment ould be standardised. In remote districts the basic alary would probably have to be higher than in other laces. The Government were also convinced that ome stability was necessary for the young doctor ntering the service. Therefore he could not accept the mendment.

Viscount Cranborne, in announcing that the Opposiion peers intended to press the matter to a division, aid they felt that the balance of the argument was in avour of Lord Moran. He assured the Government hat in this question there was no element of political ias. They were trying to come to their decision on he technical efficiency of the new scheme. The Marquess of Reading held that the method of payment proposed y the Government was just and fair. Payment by apitation fees alone might lead to an undesirable cramble for patients. Could the Government say that t was not in their mind, in the present condition of ffairs, to embark on a wider scheme—a State medical ervice and State control of doctors? Viscount Addison eplied, "I can and do give that assurance." The mendment was carried by 53 votes to 37.

CHOOSING A PARTNER

On clause 34 the Earl of Munster moved an amendnent to oblige those concerned with filling a vacant nedical practice to bear in mind when choosing an applicant such considerations as family ties and the wishes of the medical partnership. The Earl of Listowel said it was the desire of the Government that partnerships should continue so long as the doctors themselves wanted to work in partnership. He thought that family or group relationships between an applicant and the area where he wished to practise would be a material factor which the executive council could not fail to take into account in advising the Medical Practices Committee about the application. Therefore, he doubted whether any express reference was needed in the Bill, but he would gladly consult with the Minister of Health to see if it was possible to draft a form of words for inclusion at a ater stage. The amendment was withdrawn.

PROHIBITION OF SALE OF PRACTICES

Speaking as a lawyer, Lord Maugham thought some of the penal provisions of clause 35 unfair and unjust to the doctors, and Lord Jowitt promised to look into some of the points again, notably the case described by Lord Llewellin of a doctor's house which was a biggish dwelling with surgery attached to it situated in a neighbourhood where most of the houses were small and occupied by tenants of the weekly wage-earner class.

THE NEEDS OF THE DEAF

Viscount Cecil of Chelwood moved an amendment providing for a supplementary service for the deaf, including the provision and maintenance of hearing-aids and the testing of hearing, running parallel to the supplementary ophthalmic service which is to be organised by the executive councils. Lord Horder regretted that the same prominence had never been given to defects of hearing as had been accorded to defects of sight. The Earl of Listowel said that the service which Lord Cecil wanted for the deaf would be better carried out, under present circumstances, by part II of the Bill, that was to say by the hospital and specialist services. Later it should be possible to set up hearing clinics in conjunction with health centres as part of the local health service. At present the amendment might even prejudice the limited service which could now be provided for the deaf. If this supplementary service were to be given by otologists and specialists they would have to be taken from the hospitals because there were not enough of them to provide for both types of service. The new and cheaper hearing-aid sponsored by the Government would be put into manufacture as soon as possible. The amendment was withdrawn.

RIGHT OF APPEAL

The Marquess of Reading moved an amendment to replace an appeal to the Minister, from a decision of the tribunal to exclude a doctor from any list or all lists, by an appeal to a High Court judge. The debate ranged over what Lord Jowitt described as a well-trampled battlefield with hardly a blade of grass left on it. He thought he was right in saying that there was no great demand for this amendment from the doctors. The Insurance Acts procedure had worked well. The Minister was entrusted with the duty of seeing that there was an efficient service, and he could not be deprived of the right to remove somebody whom he thought was unsuited. Viscount Cranborne wondered whether it would not be possible to give the doctor greater protection at the tribunal proceedings by allowing him to be represented by counsel and to call evidence, and Lord Llewellin suggested these tribunals should be heard in public and that the chairman should be a practising barrister of some years' standing. Lord Jowitt said he thought this a possible way out of the difficulty, though he suspected that the doctors themselves might object to public tribunals. He promised to do everything in his power before the report stage to see that the tribunal was a really satisfactory body. The amendment was withdrawn.

POSTGRADUATE TRAINING

On Oct. 23, the last day of the committee stage of the Bill, the Marquess of Reading moved an amendment to provide postgraduate courses for nurses employed in the service as well as doctors and dentists. Lord Horder declared that next to the doctors it would be the nurses upon whom the success of working the scheme would fall, and it had struck many people that there was inadequate reference to their work throughout this Bill. The nurse was as keen upon being kept up to date as the doctor. The discussion, Viscount Addison said, showed how badly the Government were treated. For the first time the State was making provision for postgraduate medical training, yet they received no thanks. London offered unique opportunities for postgraduate training and the Government intended to help the medical profession and the teaching colleges to develop them. The amendment related to a clause dealing with medical practitioners under part IV of the Bill who were not employed whole-time. Whole-time servants, such as nurses and any medical men who were employed whole-time, would be provided with facilities and would be expected to undergo regular refresher courses. The amendment was withdrawn.

DISCOVERY OF RECORDS

Lord Llewellin moved to insert a new clause compelling a council, board, or committee to produce documents and records. He said that all hospitals would henceforth be Crown property, and, as he understood the law, the Minister, or any officer acting under him, would be able to claim the privileges or prerogatives of the Crown. Assuming that there had been negligence he wished anyone who brought an action to have as much chance as they would have had if the hospital

Parliament

THE BILL IN THE LORDS

Committee Stage Concluded

ON Oct. 22 Lord AMULREE moved an amendment to clause 28 in the National Health Service Bill providing that the care of old people should be placed directly under the control of the health authority. The Bill provided that all sick old people should be so cared for, and he feared that if we tried to separate old people who are sick from those who are healthy we should get into difficulties. In age the dividing line between sickness and health was small, and if there were to be any barrier between the two he thought the care of the older people would suffer. Today more and more old people had to live in institutions, and these did not come under a health authority. If, as was possible, it was found necessary to add some kind of sick quarters to these institutions there would be a danger that old people might tend to be kept there rather than removed to hospital. The Earl of LISTOWEL said that the care of the aged who were not sick did not come within the scope of the Bill, but he assured Lord Amulree that it would be dealt with in forthcoming legislation which the Government intended to introduce for the abolition of the poor-law. They regarded that as among the most important social reforms which they hoped to carry out. The amendment was withdrawn.

Lord LLEWELLIN moved an amendment to provide that medical practitioners who had to decide before the appointed day for the Bill to come into force whether they would enter the service should be given not less than three months' notice of the terms and conditions of the service. But Lord JOWITT, though in sympathy with the amendment, did not want to tie himself down in the Bill because difficulties might arise. The terms would be negotiated with representatives of the medical profession, who no doubt would keep their constituents acquainted with the matter as it proceeded. He hoped that it might be possible to give doctors more than three months' notice. Viscount CRANBORNE thought it difficult to leave the matter as it was in view of its extreme importance to the medical profession. The decision which doctors would have to make would affect the whole of their future lives, and it was only fair that Parliament should allow them adequate time for consideration. It would be an insult to the medical profession and to the skilful officials of the Ministry of Health to suggest that they could not devise terms and conditions of service in the period which would elapse before the appointed day. Lord JOWITT agreed that they ought to aim at six months' notice as a minimum, but he asked their Lordships not to put anything binding in the Bill in case there might be unexpected difficulties. He would, however, undertake to consult the Minister of Health and look at the matter again. The amendment was withdrawn.

BASIC SALARY AND CAPITATION FEE

Lord LLEWELLIN moved to add the following subsection to clause 33:

> The remuneration to medical practitioners undertaking to provide general medical services in pursuance of the provisions of this Act shall be fixed by the capitation method except in any cases where the Minister on the recommendation of the Medical Practices Committee considers that exceptional circumstances necessitate remuneration on a different basis.

As yet, he pointed out, no indication had been given of what proportion of the doctor's remuneration was to be by salary and what by capitation fee. He believed that the right way to remunerate the doctors was by capitation fee, though he realised there were areas where this would not be possible.

Lord MORAN said that this matter had aroused the misgivings of many doctors who, like himself, were satisfied, generally speaking, with the hospital provisions of the Bill. The proposal to pay a doctor a salary required more justification than had been given. There could only be two reasons. it had been suggested, was that the Socialist before it came into office had seriously consider whole-time medical service with a basic salary, the method proposed in this Bill had been adopted concession. If this was true it was not a good rea The other was a better one. It was said that any p titioner entering medicine might in his first year or have financial difficulties, and that a basic salary £300–£400 a year might supply some measure of secur But was it proposed that the Ministry of Health sho go on paying doctors a basic salary if they did not any patients in their first year or two? On the oth hand, if the doctor got patients to the equivalent amo of the basic salary, then this measure of security w no longer necessary. Not only was there very little to said for a basic salary, but there was a good deal to said for a capitation fee. In past years Lord M had been asked to advise the medical service of Navy and the Royal Army Medical Corps how to ob keen men, and the result of his investigations had that it was impossible, with many brilliant exception to keep men as keen in whole-time salaried service that nature as in general practice where the competitive stimulant was present all the time. He was convinced that if there was anything approximating to a whole time service great attention must be paid to incentive and that was why he would like to see the whole of the remuneration paid by capitation fee and the basic salary dropped. It had been said there was something derogatory in competing for patients, but was this true? Would the Noble Lord on the Woolsack be demonstrating the development of his forensic skill, if instead of competing for briefs in his earlier years he had been the salaried servant of a corporation?

Lord HORDER suggested that Mr. Bevan could do nothing more salutary, or more likely to further his happier relations with the B.M.A., than to accept this amendment. Several times during the committee stage the Government had given an assurance that there was no intention to nationalise the medical profession But those statements might be made ad nauseam and there would still be firmly fixed in the minds of the medical profession the idea that that was the final intention of the Government and of the Ministry of Health. The doctors had not been impressed by the reasons given for part payment by a basic salary. They believed this to be the most vital spot at which the Government could attack the independence of the doctor, whether as a practitioner of medicine or as a man earning his living in a reputable fashion. To accept this amendment would assure those in charge of the Bill of a big element of extra confidence in the mind of the medical profession, and the Minister had admitted that without the coöperation of the doctors the scheme fail. Lord Beveridge had said that the Bill was a go one and he wanted to make it better. Lord Ho thought the Bill was a bad one, but he would like make it less bad. The doctors would do their best to work the Bill, good or bad; they could not strike They must continue their work, and they must have State support in doing so. The doctor was not an altruist when he started in his profession; he became an altruist in proportion as he succeeded. The medical service in this country had a great deal in their favour, and though it was the duty of the State to improve the machine, it was for the doctor to work the machine A willing worker would go a long way, an unwilling worker would go only a short way, and would not ev give to this health scheme the trial which it deserved.

Viscount ADDISON, who had been largely in charge of the negotiations relating to the original capitatio

Jowitt, in accepting the amendment, confessed he did not himself think it was necessary, but rienced people had expressed apprehension and t which he thought it best to remove.

FUNCTIONS OF THE LOCAL AUTHORITIES

ord Addington moved an amendment permitting al health authority to delegate some of its functions r clause 19 to borough councils. Lord Llewellin ted out that the transfer of these powers by the C. to their boroughs had been made mandatory by l Balfour of Burleigh's amendment. Lord Jowitt, eply, said he was much opposed to Lord Balfour's ndment. If it became law there would be two health norities in all the London boroughs, some working me service and some in another, and all the services e carried out in a health centre. He believed it would absolutely chaotic. Then again the amendment was y permissive. That infringed another principle which believed to be vital. "Do not leave it to the political ation of the future as to who is going to have these ers," he advised the Noble Lords. "Take your rage in both hands, and say that we put these powers n the major local authorities; there they are, there y stay, that is their job, and they cannot get out it." The amendment was withdrawn.

GENERAL MEDICAL SERVICES

n rejecting an amendment on the point Lord Jowitt e an assurance that doctors would have ample notice the terms and conditions of service before having to ke up their minds whether they were going to come or not. The Minister had agreed that they should aim a period of six months.

The Earl of Munster moved to add to clause 34 that

> The Medical Practices Committee shall, in a case where ersons have to be selected from a number of applicants, and he Minister shall, on an appeal in any such case have regard o any desire expressed by any applicant to practise with other nedical practitioners already providing general medical services n the area or part of an area concerned, and of any desire expressed y such other medical practitioners to take any applicant into ractice with them, and shall have special regard to the matters foresaid in cases where an applicant is related to any such other nedical practitioner.

ord Jowitt accepted the amendment, for he believed e Medical Practices Committee as sensible men would any case have regard to principles of this kind.

THE NEEDS OF THE DEAF

Viscount Cecil of Chelwood moved an amendment clause 41 to provide supplementary services for the af similar to those provided for teeth and eye cases. scount Addison promised to consider whether some ity of this kind to help deaf people could be inserted rlier in the Bill at the Third Reading, but he did not ink this clause was an appropriate place, because tside the medical profession there were few competent ople for dealing with defects in hearing, and therefore ere could not be a supplementary service for the deaf. eir treatment, including the provision of apparatus, ust be provided in hospitals and clinics. The amendment as withdrawn.

THE APPEAL TRIBUNAL

Lord Llewellin moved an amendment strengthening e protection given to a doctor appearing before the ibunal by giving him the following rights:

> of appearing, either in person or by counsel or solicitor or such other representative as may be prescribed, before the Tribunal and, in the case of an appeal, before a person appointed by the Minister; and
>
> of being heard by the Tribunal or the person so appointed and of calling witnesses and producing other evidence on his behalf; and that the hearing, whether by the Tribunal or the person appointed as aforesaid, shall be in public if the person who is the subject of the inquiry so requests.

le also later moved a further amendment to the seventh chedule providing that the chairman of the tribunal hould be a practising barrister or solicitor of not en years' standing. Both amendments were

DENOMINATIONAL HOSPITALS

Lord Jowitt moved the following new clause:

> . . . Where the character and associations of any voluntary hospital transferred to the Minister by virtue of this Act are such as to link it with a particular religious denomination, regard shall be had in the general administration of the hospital and in the making of appointments to the hospital management committee to the preservation of the character and associations of the hospital.

He was, he said, unable to accept Lord Iddesleigh's amendment inserting the words "and to the staff" after "committee." He agreed that it was essential that such officers as the matron and resident physician in a hospital of this kind should be of a particular denomination, but it did not matter whether the surgeon, for instance, was a Roman Catholic or a Plymouth Brother. The amendment was agreed to.

FROM THE PRESS GALLERY

Bricks and Brickbats

Opening a debate on housing in the Commons on Oct. 21, Mr. R. E. Manningham-Buller complained that thousands of people were enduring appalling conditions of overcrowding both in the towns and in the country, yet there had only been an advance of 21,149 sites on which development had begun since Mr. Bevan took office. Moreover, on the sites available, only 18,000 new permanent houses had been erected by the end of August. No-one expected the number of permanent houses to approach the pre-war monthly average of 30,000, but surely the Government's programme should have produced more than 5000 permanent houses in each of the summer months. The main reason for this sorry figure appeared to be the four-to-one rule in relation to local authorities and private enterprise, which meant that where a local authority was laggard nothing was done in the area. From the August report it was obvious that the local authorities had started twice as many permanent houses, and had finished less than half as many as private enterprise. This was not the fault of the local authorities, who were carrying a burden for which they had not been designed. Did the Government, Mr. Manningham-Buller asked, appreciate sufficiently the needs of rural areas? Between the wars something like 40,000 houses a year were built in the country, but only 3162 had been built in the rural districts while Mr. Bevan had been in office, and 3056 of these were produced by private enterprise. He warned the Minister that all his skill in rhetoric, and all his wordy vehemence would not save him from the wrath of the people who, but for his policy, might have been enjoying better housing conditions this winter.

Mr. A. Bevan, Minister of Health, claimed that the Government's decision last year to place the principal responsibility for the provision of houses upon the local authorities had been justified. By the end of August they had handed over to the building industry the job of building 155,000 permanent houses, excluding 54,000 licences given for houses for sale. He would continue to insist that houses should be built to let, and that the local authorities should be the only instrument for carrying out the housing programme. The only valid criticism of his policy was that no houses at all should be built for sale. The temporary housing programme had been so devised by the Conservatives that unfortunately its completion was now competing with the permanent programme. But the supply of building materials was now marching with the number of houses put into contract by the local authorities. One of the reasons for the slower rate of the permanent programme was the very success of the local authorities, who had put a higher number of houses into contract than the industry were able to handle, and therefore a comparatively small labour force was spread too thinly over a large number of houses.

Lady Megan Lloyd-George thought the number of workers still employed on bomb damage repairs disquieting compared with those engaged in building permanent houses. Above all, non-essential work must be ruthlessly cut. She appealed to the Prime Minister

inister of building to coördinate the

her ministries and to be responsible

had not been taken over by the Minister. Lord JOWITT agreed that it was most desirable that in proceedings against the Crown the litigant should have a very full measure of discovery, and he hoped that he would live to introduce the Civil Proceedings against the Crown Bill which would give a very wide right of discovery. But there might be a conflict of private interest with the public interest, and those concerned with Government business should have the right to communicate with each other freely without fear that their reports would be dragged out in a court of law. But subject to these reservations he would do what he could to secure that in actions relevant to this Bill there should be a complete measure of disclosure. Lord LLEWELLIN wanted words put in the Bill to ensure that documents which previously had always been compellable out of a hospital authority should also be compellable out of a regional hospital board. Lord JOWITT thought nothing further was needed in order to ensure this. The amendment was withdrawn.

THE SCHEDULES

On the third schedule, Lord LUKE moved an amendment to provide that before making appointments to fill vacancies on a regional hospital board the Minister should consult the board. Lord JOWITT accepted this amendment and also a further amendment moved by Lord Luke to provide that before filling vacancies on a hospital management committee the board should consult the committee. Lord Jowitt was, however, unwilling to agree that the boards and committees should have the right to appoint their own chairmen, but he promised to consider whether the boards might do so subject to the Minister's approval.

The Report Stage

The amendments made to the Bill in committee were reported in the House of Lords on Oct. 28. Lord LLEWELLIN then moved an amendment to ensure that doctors on the staff of a hospital, whether in an honorary or in a paid capacity, shall have the right to arrange for the treatment of their private patients there. Lord JOWITT confessed that he did not think the new words added anything to the Bill, but if they cleared up any ambiguity he was happy to accept them, and the amendment was agreed to.

ENDOWMENTS

Lord JOWITT moved to insert a proviso that endowments given to hospitals after the passing of the Bill but before the appointed day should be vested in the hospital management committees. The effect of the amendment, he said, was to put these gifts in the same position as if they had been made after the appointed day. Treasury control must always be rigorous, and it was right that it should, for all taxpayers were anxious that money should be saved where possible. But the running of a hospital on strict lines meant that many little comforts and amenities would not be provided unless the charitable came forward as they had done in the past. The Government were anxious to encourage them to do so, and he did feel that there was a danger that people would not give their money between the passing of the Act and the appointed day if they knew it would be carried over to a general fund. The amendment was carried.

Lord Jowitt moved an amendment to ensure that the Minister shall secure

> so far as is reasonably practicable, that the objects of the endowment and the observance of any conditions attaching thereto, including in particular conditions intended to preserve the memory of any person or class of persons, are not prejudiced.

He hoped their Lordships would agree that these words would give effect to what everyone wanted—that the wishes of the people who gave money to hospitals were not disturbed more than was necessary to make the hospitals efficient. The amendment was agreed to.

FUNCTIONS OF THE HOSPITAL MANAGEMENT COMMITTEES

Lord JOWITT moved to substitute the following section for subsection 2 in clause 12

> It shall be the duty of the hospital management com of any hospital or group of hospitals, subject to and in acco with regulations and such direction as may be given b Minister for the Regional Hospital Board, to control and that hospital or group of hospitals on behalf of the Board for that purpose to exercise on behalf of the Board such *functions of the Board relating* to that hospital or gro hospitals as may be prescribed.

The new subsection, like most of the other amendme was, he said, in accord with the undertaking given the Minister. But the new subsection differed from old in emphasis and form. The criticism levelled ag the Bill as drafted was that while the duty of the regi board was set out with precision, it was not really what the hospital management committee had to And that was true, for the Government intended to with the matter entirely by regulation. But they anxious that there should be the greatest measure decentralisation and devolution, and Noble Lords *not unnaturally been anxious to see this in the Bill.* must make it plain that what the committees *did th* were to do on behalf of and under the control of t boards, but he wanted to establish on the face of the that they had a real job of work to do. Viscou MAUGHAM, though he did not think the new amendm entirely carried out the desires of those who had interests of the hospital management committees heart, believed that with the help of this subsection regulations and directions which might be given by Minister would do so. But if the committees rema merely the agents of the boards they might not be to do anything without consulting the boards, and *was what the committees did not like.* He did not him believe that that was the intention of the Governm and he thought that what the Government had would ensure that the regulations and directions w be so framed that all the everyday work of the hos would be, by devolution, the business of the ho committee, to be carried out by them without con appeals either to the board or the Minister. LLEWELLIN was satisfied that the amendment did on the face of the Bill that the committees were given the control and management of the hospitals.

THE TEACHING HOSPITALS

Lord JOWITT moved an amendment to provide th the university with which a teaching hospital is associat should be provided with facilities for clinical teachi and research. He had found, he said, the joint pres of Lord Moran and Lord Horder irresistible when th asked him to put in something to show that one of t duties of a teaching hospital was to teach. He agr whole-heartedly and had therefore placed it in the fo front of the list of their obligations, for unless teachi was properly done the whole art and skill of the profess would go. He had, however, been unable to accept t suggestion of Lord Moran's amendment that the Gove ment were bound to carry out whatever the univers liked to order, for even universities might have rat *large and ambitious ideas.* He had therefore inclu in the amendment the words "Such facilities as appe to the Minister to be required for clinical teaching a research."

RIGHT OF DISCOVERY

Lord LLEWELLIN moved to insert at the end clause 13

> A Regional Hospital Board, board of governors or hosp management committee shall not be entitled to claim in a proceedings any privilege of the Crown in respect of the discov or production of documents, but this subsection shall be witho prejudice to any right of the Crown to withhold or procure t withholding from production of any document on the grou that its disclosure would be contrary to the public interest.

d Jowitt, in accepting the amendment, confessed , he did not himself think it was necessary, but erienced people had expressed apprehension and bt which he thought it best to remove.

FUNCTIONS OF THE LOCAL AUTHORITIES

ord Addington moved an amendment permitting ocal health authority to delegate some of its functions ler clause 19 to borough councils. Lord Llewellin nted out that the transfer of these powers by the .C. to their boroughs had been made mandatory by rd Balfour of Burleigh's amendment. Lord Jowitt,/ reply, said he was much opposed to Lord Balfour's endment. If it became law there would be two health horities in all the London boroughs, some working one service and some in another, and all the services be carried out in a health centre. He believed it would absolutely chaotic. Then again the amendment was ly permissive. That infringed another principle which believed to be vital. "Do not leave it to the political tation of the future as to who is going to have these wers," he advised the Noble Lords. "Take your rage in both hands, and say that we put these powers on the major local authorities; there they are, there ey stay, that is their job, and they cannot get out it." The amendment was withdrawn.

GENERAL MEDICAL SERVICES

In rejecting an amendment on the point Lord Jowitt ve an assurance that doctors would have ample notice the terms and conditions of service before having to ke up their minds whether they were going to come or not. The Minister had agreed that they should aim a period of six months.

The Earl of Munster moved to add to clause 34 that

> The Medical Practices Committee shall, in a case where ersons have to be selected from a number of applicants, and he Minister shall, on an appeal in any such case, have regard o any desire expressed by any applicant to practise with other nedical practitioners already providing general medical services n the area or part of an area concerned, and of any desire expressed y such other medical practitioners to take any applicant into ractice with them, and shall have special regard to the matters foresaid in cases where an applicant is related to any such other nedical practitioner.

rd Jowitt accepted the amendment, for he believed Medical Practices Committee as sensible men would any case have regard to principles of this kind.

THE NEEDS OF THE DEAF

Viscount Cecil of Chelwood moved an amendment clause 41 to provide supplementary services for the f similar to those provided for teeth and eye cases. count Addison promised to consider whether some y of this kind to help deaf people could be inserted lier in the Bill at the Third Reading, but he did not nk this clause was an appropriate place, because side the medical profession there were few competent ple for dealing with defects in hearing, and therefore re could not be a supplementary service for the deaf. ir treatment, including the provision of apparatus, st be provided in hospitals and clinics. The amendment s withdrawn.

THE APPEAL TRIBUNAL

ord Llewellin moved an amendment strengthening protection given to a doctor appearing before the unal by giving him the following rights:

> appearing, either in person or by counsel or solicitor or such her representative as may be prescribed, before the Tribunal nd, in the case of an appeal, before a person appointed by the linister; and
> being heard by the Tribunal or the person so appointed and of lling witnesses and producing other evidence on his behalf; nd that the hearing, whether by the Tribunal or the person ppointed as aforesaid, shall be in public if the person who is e subject of the inquiry so requests

also later moved a further amendment to the seventh edule providing that the chairman of the tribunal uld be a practising barrister or solicitor of not less than years' standing. Both amendments were accepted.

DENOMINATIONAL HOSPITALS

Lord Jowitt moved the following new clause:

> . . . Where the character and associations of any voluntary hospital transferred to the Minister by virtue of this Act are such as to link it with a particular religious denomination, regard shall be had in the general administration of the hospital and in the making of appointments to the hospital management committee to the preservation of the character and associations of the hospital.

He was, he said, unable to accept Lord Iddesleigh's amendment inserting the words "and to the staff" after "committee." He agreed that it was essential that such officers as the matron and resident physician in a hospital of this kind should be of a particular denomination, but it did not matter whether the surgeon, for instance, was a Roman Catholic or a Plymouth Brother. The amendment was agreed to.

FROM THE PRESS GALLERY

Bricks and Brickbats

Opening a debate on housing in the Commons on Oct. 21, Mr. R. E. Manningham-Buller complained that thousands of people were enduring appalling conditions of overcrowding both in the towns and in the country, yet there had only been an advance of 21,149 sites on which development had begun since Mr. Bevan took office. Moreover, on the sites available, only 18,000 new permanent houses had been erected by the end of August. No-one expected the number of permanent houses to approach the pre-war monthly average of 30,000, but surely the Government's programme should have produced more than 5000 permanent houses in each of the summer months. The main reason for this sorry figure appeared to be the four-to-one rule in relation to local authorities and private enterprise, which meant that where a local authority was laggard nothing was done in the area. From the August report it was obvious that the local authorities had started twice as many permanent houses, and had finished less than half as many as private enterprise. This was not the fault of the local authorities, who were carrying a burden for which they had not been designed. Did the Government, Mr. Manningham-Buller asked, appreciate sufficiently the needs of rural areas? Between the wars something like 40,000 houses a year were built in the country, but only 3162 had been built in the rural districts while Mr. Bevan had been in office, and 3056 of these were produced by private enterprise. He warned the Minister that all his skill in rhetoric, and all his wordy vehemence would not save him from the wrath of the people who, but for his policy, might have been enjoying better housing conditions this winter.

Mr. A. Bevan, Minister of Health, claimed that the Government's decision last year to place the principal responsibility for the provision of houses upon the local authorities had been justified. By the end of August they had handed over to the building industry the job of building 155,000 permanent houses, excluding 54,000 licences given for houses for sale. He would continue to insist that houses should be built to let, and that the local authorities should be the only instrument for carrying out the housing programme. The only valid criticism of his policy was that no houses at all should be built for sale. The temporary housing programme had been so devised by the Conservatives that unfortunately its completion was now competing with the permanent programme. But the supply of building materials was now marching with the number of houses put into contract by the local authorities. One of the reasons for the slower rate of the permanent programme was the very success of the local authorities, who had put a higher number of houses into contract than the industry were able to handle, and therefore a comparatively small labour force was spread too thinly over a large number of houses.

Lady Megan Lloyd-George thought the number of workers still employed on bomb damage repairs disquieting compared with those engaged in building permanent houses. Above all, non-essential work must be ruthlessly cut. She appealed to the Prime Minister to establish a minister of building to coördinate the activities of the other ministries and to be responsible for building priorities. Dr. L. **COMYNS** drew attention to the serious situation in blitzed areas. In Silvertown, his own constituency in the East End of London, 16,000 families were desperately in need of accommodation. Was it any wonder, he asked, that the temper of the people was rising and that they put forward a claim for priority for their housing? He suggested that the labour shortage could be relieved in three ways—by a severe curtailment of the licences granted by local authorities and the Ministry of Works, by limiting the issue of licences by the Ministry of Works for non-essential work without regard to local needs, and by limiting the permitted registration of master builders.

Mr. C. **KEY**, parliamentary secretary to the Ministry of Health, in reply, said that talk about the failure to mobilise the private builder was beside the point, because practically all the present building was being carried out by private builders for the local authorities. In the end the four-to-one rule only operated in regard to the user of the house. In a recent circular the Ministry had urged that small builders should be brought together to build under contract for the local authorities 2 to 6, or up to 12, houses at a time. But the Government held that it was for the local authorities to decide that the houses should be provided, not for those who could afford to pay most but for those who had the greatest need. As showing the nation-wide effort of the local authorities to provide houses, Mr. Key said that whereas by March 31, 1920, out of a total of 1802 local authorities only 370 were building houses and only 715 houses had been completed, on August 31 this year of 1469 local authorities 1172 had houses built or building and had completed 6800 permanent houses. They had a further 89,584 houses under construction. Meanwhile work had been completed on the repair of 630,000 war-damaged houses, a further 89,000 had been made habitable, something like 50,000 houses had been erected, and 25,000 families had been provided with accommodation by the adaptation and conversion of houses. The labour actually employed on housing work had increased by 70% between July 31, 1945, and August 31, 1946. By the latter date the Government had provided accommodation for 200,000 families, and had under construction accommodation for another 200,000.

QUESTION TIME

Proposed Hospital Regions

Colonel M. **STODDART-SCOTT** asked the Minister of Health whether he was yet in a position to place in the library of the House a map showing the hospital regions he had in mind in the National Health Service Bill and the medical schools with which they were associated.—Mr. A. **BEVAN** replied: No. If the Health Bill becomes law in its present form it would then be my duty to consult the bodies and organisations concerned and lay an order defining the hospital regions before Parliament.

Resettlement of Medical Practitioners

Sir **ERNEST GRAHAM-LITTLE** asked the Minister of Health what provision was made for the resettlement in practice of medical practitioners whose houses were mortgaged to insurance companies at the time of their call-up to the Forces and who were faced with foreclosure by the insurance companies and found themselves, on demobilisation, homeless and without means to buy another practice.—Mr. A. **BEVAN** replied: The arrangements made to assist the resettlement of medical officers discharged from the Forces do not include the provision of money for the purchase of a practice which can normally be obtained from the financial agencies with whom the medical profession are accustomed to deal. If the Health Service Bill is approved by Parliament the purchase of a practice will, when the service comes into force, no longer be necessary.

Hospital Domestic Staff

Mr. R. W. **SORENSEN** asked the Minister of Labour whether, in order to ease the shortage of hospital nurses and domestic staff, further steps would be taken to invite applications both for training in nursing and for domestic work from foreign and colonial sources, including West Africa.—Mr. G. **ISAACS** replied that in addition to those coming from overseas under existing schemes, a thousand women selected from displaced persons now in the British Zone of Germany would shortly be arriving in this country for domestic work in T.B. hospitals. The extension of this scheme to include st nurses and also domestic workers for other types of h was under consideration.

M.R.C. Staff

Replying to a question, Mr. **HERBERT MORRISON** said t the salaries paid to the staff of the Medical Research Cou were as follows:

	Numbers	*Salar* £
Administrative officers	10	590–2
Scientific staff, including qualified assistants	204	300–2
Other staff paid monthly	171	250–7
Established staff paid weekly	63	Under
Temporary staff paid weekly (mainly under age 21)	96	Under

In addition, there are 15 scientific officers and 8 tempora staff paid weekly employed on a part-time basis, with salar pro rata within the ranges given above. The staff of t council were free to join trade unions and participate in un activities, as were civil servants.

What We Eat

Mr. **EDWARD EVANS** asked the Minister of Food how overall consumption of food in the United Kingdom September, 1946, compared with the consumption in Ju 1939; in how many main items the consumption was gre in how many it was less; and by what percentages in ea case.—Mr. **JOHN STRACHEY** replied: Comparisons for as sho a period as a month are misleading, and for the overall co sumption of food my statisticians work on a six mont period. We were eating in the first half of this year on t average about 7% less calories per head per day than befo the war. For the current six months consumption appe to be running at a rate of 2920 calories per head per day compared with 3000 before the war; thus our overall consum tion may be shown, when we get the final figures, to be no only some 3% below pre-war. But of course these averag conceal the fact that some people are eating much less, a other people much more, food than they did before the w The following figures from the *Statistical Digest* (Augu 1946) compare the actual amounts of those foods which we *out of our hands and into those of the public in* the thr *months' period, June, July, and* August of this year, wi the consumption of those foods on an average for the ye 1934–38.

In fats, butter, margarine, cooking fat, and the like, taken togeth we are each of us on the average eating about 4 oz. for every 5 o we ate before the war.

We are getting 9 oz. of tea for every 10 oz. we drank befo the war.

We are only getting just over half as many shell eggs per head we did before the war, and the same is true of bacon and ham.

Taking fresh and tinned meat together, we are eating alm exactly as much, on the average per head, as we did before the w

On the other hand we are eating:

Nearly 3 lb. of fish for every 2 lb. of it we ate before the w

Even after bread-rationing we are still eating just a lit more bread, cakes, &c., than before the war.

We are eating 5 pots of jam or marmalade for every 4 p that we ate before the war and, last but not least, we drinking very nearly half as much milk again, 47% more, th before the war.

The House must not suppose that in giving these figu I am denying the existence of a food shortage. On the contra there is still a food shortage just as there was before the w But now because of the great increase in working-class pu chasing power everybody has much nearer a fair share.

Milk-production

Replying to a question, Mr. T. **WILLIAMS** stated that estimated total quantity of milk produced, including mi fed to livestock, in England and Wales in the year end May 31, 1946, was 1402 million gallons, and that for 1945– was provisionally estimated at 1444 million gallons. T corresponding figure for 1938–39 was 1463 million gallons.

Supplies of Penicillin

Sir **JOHN MELLOR** asked the Minister of Supply whether was satisfied that sufficient penicillin was now available f United Kingdom requirements; and whether he wou revoke the Control of Penicillin Order, 1946.—Mr. Jon **WILMOT**: Although the supply position has improved co siderably, the removal of control measures would not justified at present. The scope of the order is, howeve being extended, as from Nov. 1 next, to allow registere veterinary surgeons to acquire supplies of penicillin.—Sir Jon **MELLOR**: Are we not now exporting penicillin?—Mr. **WILMOT** Yes.

Bovine Tuberculosis

ieut.-Colonel G. M. **SHARP** asked the Minister of Agriculture ther the months of delay in the identification of a tuberıus cow in a herd suspected of having caused bovine erculosis was due to unavoidable technical reasons; and ether he would exercise his powers under the Food and ıgs (Adulteration) Act, 1938, and order immediate pasteuriion of the milk from that herd.—Mr. T. **WILLIAMS** replied ıt where tubercle bacilli were found in a bulk sample of milk ken in a consuming area, the offending cow, if still in the rd, was usually detected quickly, but in a small minority cases there might be some unavoidable delay, due to the ed for biological tests. The point raised in the latter part of e question was, however, under consideration by the partments concerned in connexion with the revision of the ılk and Dairies regulations.

Care of Children

Mr. **WILSON HARRIS** asked the Minister of Health whether is attention had been drawn to the strictures passed in the eport of the Curtis Committee on the treatment of children n many public-assistance institutions; by what local or entral authority these institutions were inspected; whether here had, in fact, been regular inspection; and whether e facts cited were known by his department.—Mr. **BEVAN** replied: These institutions are supervised by county and county-borough councils and inspected by my inspectors. During the war the frequency of inspections had to be reduced and many of the defects found could not be easily remedied, but my department and the authorities did their best under war-time conditions to maintain a proper standard.

Mr. **WILSON HARRIS**: I am sure the Minister feels as strongly about this as anyone could but does he mean that the revolting conditions disclosed in this report could go on existing without anyone in a position to alter them knowing about them; if so, can he give the House a definite assurance that any steps taken under this report will provide absolute safeguards against any child being subject to these conditions in future?—Mr. **BEVAN**: The hon. member and the House generally will probably have an opportunity of considering the whole matter and they will then be able to satisfy themselves whether our proposals are sufficient to prevent a recurrence of these unhappy incidents. But I hope hon. members will not convey the impression that this state of affairs is universal, otherwise we should lose very many of the devoted workers who are at the moment feeling that they have been tainted by the general atmosphere.

Mrs. **LEAH MANNING**: In view of the last remark would it not be a good thing if the Minister published the names of those institutions against which the worst of these strictures have been made and which have given rise to the greatest public indignation?—Mr. **BEVAN**: I would like notice of that question, but I must point out that there are some difficulties connected with it. If evidence given to a Crown inquiry is to be published in this way it might stop such evidence ever being collected in future.—Mrs. **AYRTON GOULD**: Is anything being done to put a stop to bad conditions, where it has been proved that they exist, pending the statement to be made in the House?—Mr. **BEVAN**: Certainly; inspection is now proceeding more vigorously and efficiently than ever before and greater protection is given to these children.

B.C.G. Vaccine

Dr. S. **SEGAL** asked the Minister of Health to what extent supplies of B.C.G. vaccine for tuberculosis were now available in this country; and how they might be obtained.—Mr. **BEVAN** replied: B.C.G., which is used in various countries for the prevention (not the treatment) of tuberculosis, is not at present available here. Steps are being taken, however, with a view to securing its manufacture in this country.—Dr. **SEGAL**: Is it not time the Minister appointed a commission of inquiry into the relative merits of this and other vaccines for the prevention of tuberculosis among contacts?—Mr. **BEVAN**: The situation in this field fortunately changes almost from week to week, and it is indeed doubtful whether a commission of inquiry would be in a sufficiently static position to make its recommendations of any value.

Tuberculosis in Vienna

Replying to a question, Mr. J. **HYND** stated that there were 491 new cases of tuberculosis in Vienna in April, 481 in May, 658 in June, 369 in July, 382 in August, and 335 in September. The number of beds at present available for these cases in Vienna was 2500.

Obituary

T. WARDROP GRIFFITH

C.M.G., M.D., LL.D. ABERD., D.SC., F.R.C.P.

Dr. T. Wardrop Griffith, emeritus professor of medicine in the University of Leeds, died at his home in Leeds on Oct. 21, at the age of 85.

Born in Aberdeen, he was educated at the grammar school and the university there. A year after qualifying, with highest honours, in 1882, he went to Leeds, where he was to spend the rest of his life. After holding an appointment as resident medical officer at the General Infirmary, he turned his attentions to anatomy, and in 1887 was elected to the chair. The next year he took his M.D., again with highest honours. He became M.R.C.P. in 1901, and F.R.C.P. in 1908. He had wide interests, for he held appointments also as honorary physician and honorary pathologist to the General Infirmary; and in 1910 he surrendered the chair of anatomy to take that of medicine, which he retained until his retirement in 1925. His main interest was cardiology; and his Schorstein lecture of 1912 was devoted to Cardiac Problems.

J.P. Studio, Leeds

During the first world war he served, as a major and later lieut.-colonel, with no. 2 Northern General Hospital at Beckett's Park, Leeds; and in 1918 he was appointed C.M.G. From 1918 to 1927 he represented the University of Leeds on the General Medical Council. He was also honorary cardiac consultant in Yorkshire to the Ministry of Pensions, honorary consulting physician to the Leeds Public Dispensary, and consulting physician to St. James's Hospital. In 1922 his own university honoured him with the degree of LL.D., and in 1929 he received the honorary degree of D.SC. from the University of Leeds. From 1924 to 1926 he served on the council of the Royal College of Physicians.

The Leeds School of Medicine owes much to Wardrop Griffith. His teaching in the outpatient department and the wards, coupled with his devoted care for patients and his never-failing punctuality were a source of inspiration to the students of his day; and he gained the affection and regard of all who came into contact with him.

His wife, formerly Miss Louise Talbot, of Leeds, died in 1937. Two sons survive him, one of whom is headmaster of Oakham School.

Public Health

Paratyphoid Fever in Sheffield

THE outbreak of paratyphoid fever reported in Sheffield is due to Vi-bacteriophage type 2. Admissions to hospitals continue, and 94 cases were confirmed or suspected up to Oct. 28. The outbreak is peculiar in that the attack-rate is heaviest in children under 10 years of age and the maximum incidence appears to be in the 1–5 year age-group. At these ages the disease is of moderate severity. The more usual aliments have been excluded, but the vehicle of infection remains undetermined. The outbreak appears to be confined to Sheffield, but doctors in surrounding districts should be prepared to encounter cases of paratyphoid fever. By bringing suspicious illness to the notice of health departments promptly they may help the investigations.

Infectious Disease in England and Wales

WEEK ENDED OCT. 19

Notifications.—Smallpox, 0; scarlet fever, 1048; whooping-cough, 1375; diphtheria, 278; paratyphoid, 22; typhoid, 5; measles (excluding rubella), 2385; pneumonia (primary or influenzal), 407; cerebrospinal fever, 30; poliomyelitis, 20; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 57; puerperal pyrexia, 134; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals *of the London County Council on Oct. 16 was 835.* During the previous week the following cases were admitted: scarlet fever, 66; diphtheria, 25; measles, 21; whooping-cough, 20.

Deaths.—In 126 great towns there were 1 (0) from enteric fever, 1 (0) from measles, 1 (0) from scarlet fever, 11 (1) from whooping-cough, 1 (0) from diphtheria, 48 (0) from diarrhœa and enteritis under two years, and 8 (2) from influenza. The figures in parentheses are those for London itself.

Rhondda reported the fatal case of an enteric fever. There were 8 deaths from diarrhœa and enteritis at Liverpool.

The number of stillbirths notified during the week was 295 (corresponding to a rate of 33 per thousand total births), including 28 in London.

Appointments

EUSTACE, A., M.B. N.U.I., D.P.H.: medical officer of health and school medical officer, Accrington.

GEFFEN, D. H., M.D. Lond., D.P.H.: medical officer of health, borough of St. Pancras.

LLOYD, N. L., M.B. Lond., M.R.C.P.: chief medical officer, Ministry of Supply.

LOVELOCK, J. E., B.M. Oxfd, M.R.C.P.: physician i/c department of physical medicine, Hospital for Consumption and Diseases of the Chest, Brompton.

MCLARTY, I. J., M.B. Edin.: assistant medical officer for maternity and child welfare, Sheffield.

MOORE, E. H., M.B. Lpool, D.P.H.: deputy medical officer of health, Accrington.

PATERSON, A., M.D. Edin., M.R.C.P.: physician, Maudsley Hospital, London.

ROTH, M., M.B. Lond., M.R.C.P.: senior registrar, Maudsley Hospital, London.

STOKES, J. F., M.B. Camb., M.R.C.P.: assistant physician, University College Hospital, London.

WHITE, D. N., M.B. Camb., M.R.C.P.: senior registrar, Maudsley Hospital, London.

Chelsea Hospital for Women:

EVANS, A. B., M.B. Camb., F.R.C.S., M.R.C.O.G.: surgeon to outpatients.

JACKSON, I. M., M.B. Camb., F.R.C.S., M.R.C.O.G.: chief assistant.

LEWIS, T. L. T., M.B. Camb., F.R.C.S.: chief assistant.

RICKFORD, R. B. K., M.D. Lond., F.R.C.S., M.R.C.O.G.: chief assistant.

STEEL, G. C., M.R.C.S., D.A.: anæsthetist.

WOODFIELD-DAVIES, H., L.M.S.S.A., D.A.: anæsthetist.

WYNN-WILLIAMS, G., M.B. Lond., F.R.C.S., M.R.C.O.G.: chief assistant.

Births, Marriages, and Deaths

BIRTHS

HEMPHILL.—On Oct. 23, in London, the wife of Dr. Peter Hemphill—a daughter.

KREMER.—On Oct. 21, in London, the wife of Dr. Michael Kremer—a son.

MISKIN.—On Oct. 22, at Hove, the wife of Dr. G. W. Miskin—a daughter.

MOSS-BLUNDELL.—On Oct. 25, at Moreton-in-Marsh, the wife of Major A. J. Moss-Blundell, R.A.M.C.—a son.

PUGH.—On Oct. 19, at Hitchin, the wife of Dr. Griffith Pugh—a daughter.

RIDDOCH.—On Oct. 22, in London, the wife of Mr. Keith Riddoch, F.R.C.S.E.—a son.

SANDERSON.—On Oct. 20, the wife of Dr. G. H. Sanderson, of Horncastle—a daughter.

SCHOLEFIELD.—On Oct. 18, at Chiswick, the wife of Mr. John Scholefield, F.R.C.S.—a daughter.

TURNER.—On Oct. 21, at Maidenhead, the wife of Dr. Donald Turner—a daughter.

WELBON.—On Oct. 21, at Ipswich, the wife of Dr. J. W. S. Welbon—a daughter.

DEATHS

BURRELL.—On Oct. 22, at Fareham, Arthur William Burrell, M.D. Lond., M.R.C.S., aged 84.

DRYBROUGH-SMITH.—On Oct. 19, at St. Leonards-on-Sea, Ernald Drybrough-Smith, M.D. Edin., F.R.C.S.E., aged 64.

ELLIOT.—On Sept. 7, at Shoal Bay, New South Wales, Henry Pritchard Elliot, M.B. Edin., aged 75.

FELIX-JONES.—On Oct. 21, at Bournemouth, Frederick Felix-Jones, M.R.C.S., D.P.H., aged 90.

GRIFFITH.—On Oct. 21, at Leeds, Thomas Wardrop Griffith, C.M.G., M.D., LL.D. Aberd., D.SC. Leeds, F.R.C.P., emeritus professor in the University of Leeds, aged 85.

JACKSON.—On Oct. 21, at Worthing, Brevet-Colonel George Scott Jackson, C.B.E., D.S.O., T.D., M.D. Glasg.

LEDWARD.—On Oct. 19, Hugh Davenport Ledward, M.A., M.B. Camb., late of Broadway, Letchworth, Herts, aged 68.

MACDONALD.—On Oct. 26, at Barnton, Midlothian, William Kelman Macdonald, M.D. Edin.

MALLAM.—On Oct. 24, at Oxford, Ernest Mallam, D.M. Oxfd.

PEACOCK.—On Oct. 22, at Ipswich, William Henry Peacock, C.B.E., M.B. Durh.

TROUP.—On Oct. 24, at Inveresslie, Aberdeenshire, George Alexander Troup, T.D., M.D. Aberd., D.P.H.

VIRET.—On Oct. 23, Wilfrid Foster Viret, D.S.O., M.R.C.S., aged 36.

Notes and News

MORE NURSES

THE demands which nursing is going to make on the woman-power of the country can no longer be met from the yearly quota of girls who obtain the school certificate, and Sir Ernest Rock Carling, F.R.C.S., speaking at the Southend Municipal Hospital on Oct. 19, declared that examinations were anyhow a false guide to the women who were wanted. He would like to see established a two-year basic course in the art and craft of nursing, open to girls without any difficult entrance examination, to be taken by all recruits, which would at the end entitle them to the name of "nurse"—not assistant nurse. In a further course of 1½ to 2½ years for all whose education was adequate, specialisation might begin early, and these students would attain to the title of nursing-sister (surgical), (children), (obstetric), and so on. From the best of this class would be chosen those who would graduate from the staff colleges which he would like to see set up in every region or group of regions, each allied to a university. Their graduates would provide the matrons, sister-tutors, and sisters-in-charge.

Going on to speak of the future functions of these leaders of the profession, Sir Ernest suggested that the work of the matron might be divided between wardens, who would be in charge of the nurses' colleges and hostels, and administrators of high rank who would not attempt to preserve a day-to-day knowledge of all the diverse fields of technical competence. That would be left to the sisters in charge of medical and surgical units, whose status was enhanced in proportion as treatment became more technical. Indeed, Sir Ernest thought, the sister-in-charge had had a raw deal from the Rushcliffe Committee; for in his opinion hers is the supreme position in the nursing world of the future.

INDUSTRIAL HEALTH IN CROYDON

AT Croydon, which up till now has had seven or eight doctors employed on part-time factory work, an industrial medical council has been formed to provide employers with clinical and advisory services. The council is prepared to undertake the examination of employees, the treatment of factory injuries, and the training of first-aid personnel; and to advise on hygiene in the factory, prevention of sickness, observation of young workers, and food. According to the *Manchester Guardian* (Oct. 24) it is suggested that the smaller firms should organise themselves into groups of four and six, all of whose employees would be attended and advised by one doctor; and the Croydon Chamber of Commerce has agreed to assist in this arrangement. The scheme has been initiated principally by Sir Ernest Cowell, F.R.C.S., who sees the council as the prototype of a national scheme.

HEBERDEN SOCIETY'S DINNER

AT a dinner given by the society in London on Oct. 25, Dr. C. W. Buckley, the president, proposing The Future of Rheumatology, recalled that the society, now celebrating its tenth anniversary, had originated and developed almost side by side with the Empire Rheumatism Council. A new stage in the campaign was beginning, in which the disease was to be studied from its origin; the first objective must be to educate the general practitioner in the early manifestations of the disease; the general public, too, should be taught the importance of seeking prompt medical advice. Prof. L. S. P. Davidson said that central and local authorities had been slow to support the campaign because they had hitherto not been satisfied that the scientific and clinical approach were up to the required standard; indeed, physicians, including those in teaching hospitals, had run away from the problem. Now, however, the Ministry of Health and the Department of Health for Scotland were willing to help. Professor Davidson expressed his faith in a sound future service for the elucidation of the problem. Dr. W. S. C. Copeman, proposing The Guests, said that the presence of Lord Moran, P.R.C.P., indicated that the society had attained adult status. He also welcomed as a guest Lord Horder, an honorary member of the society, to whom the success of the campaign was largely due; Lord Horder had taken an active part in the campaign against rheumatism from the first, when "he found this a medical Cinderella of easy virtue." Dr. Loring T. Swaim, replying for the guests, said that since the formation of the American Rheumatism Association the general public's interest in the disease had been aroused. Moreover, in every American university udents were having a course of instruction on the disease. r. Birger Strandell said that the Swedish Medical Society ad lately established a rheumatism section; the problems n his country were similar to those in Britain.

ONCESSIONS TO NURSING CANDIDATES WITH WAR EXPERIENCE

ASSISTANT nurses who have been enrolled by virtue of two ears' whole-time nursing since the war began may be granted remission of six months in the normal three-year period of raining for State registration. This concession already applies to men and women who have had suitable nursing experience in the Forces or as members of the Civil Nursing Reserve, the British Red Cross Society, or the St. John Ambulance Brigade. Men and women with not less than two years' active nursing experience in one of the above categories will also be eligible for a remission of one year in the normal two-year period of training for the Tuberculosis Association's certificate: they may be allowed to take part I of the examination on entry to training.

Application should be made to the hospital or sanatorium where the candidate wishes to train.

THE SMOKE EVIL

IN his presidential address to the National Smoke Abatement Society at Brighton on Oct. 24, Sir GEORGE ELLISTON said that the society's policy is no longer a counsel of perfection; it has now become a matter of urgent necessity on the lowest economic grounds alone. "There is little use the Ministry of Fuel and Power and other Ministries lamenting the shortage of coal for every purpose—industrial, domestic, and export—when we scatter no less than 2½ million tons of it unburnt into the air to cause damage to our buildings and possessions, which with other costs conservative authorities have estimated at £2 million per week. . . Fantastic as it may seem, we are in effect employing 10,000 miners to produce smoke, and a far greater number of other people in clearing up and making good all the damage it does." The fight against the smoke evil, which for generations had wasted so much of the nation's health and wealth, was now, Sir George thought, entering its final and decisive stage. "The full implementation of all that is contained in the Domestic Fuel Policy Report, the provision of new kinds of legislation, and the early establishment of expanding smokeless zones—all these and other policies are practicable, and give well-defined objectives that when they are won will mean the virtual end of smoke."

A report to the conference showed that, of 200 local authorities questioned, about a quarter have considered the possibility of heating buildings from a central source, as has been done successfully on the Continent. In all parts of the country antiquated grates burning solid fuel are being fitted in new houses because of the acute shortage and high cost of modern types able to burn both soft coal and other solid fuel. One speaker said that in the ordinary domestic grate only 10% of the potential heat in the coal is usefully employed, and another recalled that more than two years ago the *Housing Manual* of 1944 urgently recommended that the new types only should be used in all new houses. "We hear with dismay that appliances of obsolete pattern are still being produced and supplied to housing authorities."

SAFETY UNDERGROUND

IT will be recalled that some weeks ago a London Transport electric train overran the buffers after the collapse and sudden death from heart-failure of the motorman. Precautions against such accidents as this fall into two groups: (1) engineering devices, such as automatic signalling and "dead man's handles"; and (2) the medical selection of motormen. We are informed that operative staff employed by the London Passenger Transport Board are carefully investigated after any lengthy illness or whenever their complaint may be associated with sudden incapacity. They are also examined at promotion and at the ages of 60, 62, and 64, and their vision is tested at the ages of 50 and 55. Regular medical examination may reveal some of the causes of sudden complete incapacity; but others, such as angina pectoris, petit mal and grand mal, narcolepsy, and congenital cerebral aneurysm may remain undetected in the absence of a preliminary complaint by the patient. Fortunately sudden illness from these causes seldom occurs without some preliminary incapacity; and experience has shown that the man's sense of responsibility prompts him to declare his symptoms.

CARE IN MILK CERTIFICATION

THE Ministry of Food is appealing to doctors to observe scrupulous accuracy in certification when patients ask for priority milk and to confine the issue of certificates to the categories sanctioned. During the late war priority allowances to invalids amounted to about 200,000 gallons a week; they now stand at 1,300,000 a week, though there is no reason to suppose that there has been a corresponding increase in invalidism.

The supply situation this winter will be such that unless a reduction to the war-time level is attained the weekly allowance to normal consumers will probably have to be reduced to below the present 2 pints. After Nov. 30 no medical certificate for priority milk dated before Nov. 3 will be valid, and the Ministry hopes that doctors will take this opportunity for recertification to explain to applicants for certificates that stricter criteria are imperative. Failing improvement it may be necessary to curtail the allowances to invalids or to reduce the number of priority categories.

CANCER EXPLAINED FOR THE LAYMAN

IN a little book[1] designed to provide the non-medical reader with factual information about the nature, diagnosis, and treatment of cancer, and to stimulate his interest in cancer research, Dr. Berenblum uses in the main non-technical and simple language. Where technical terms are unavoidable they are clearly explained and are included in a glossary. Eight pages of diagrams and photographs provide simple, well-chosen visual aids to a comprehension of the problems discussed. The frequency of cancer, the influence of heredity and environment, and the essential nature of the disease are discussed, and the author does much to dispel the prevalent but erroneous belief that, since nothing is known about cancer, one man's opinion is as good as another's. He sketches present-day methods of treatment and puts them in a favourable light, without ignoring their limitations. The exact difficulties which face those in search of an ideal curative agent are set forth candidly, which will give laymen some data on which to judge extravagant claims.

Among experts, the chapters on the nature of cancer and research would be likely to provoke some adverse comment, but it is not for the expert that they were written. The likely effect upon the layman is difficult to judge: he will certainly gain insight into the complexity of the whole problem and will realise that workers in this field have accomplished much.

University of Oxford

In a congregation on Oct. 17, the following degrees were conferred:

B.M., B.Ch.—J. G. Byrne, I. M. Shepherd, J. C. Edwards, L. H. Truelove, E. O. Field, M. S. de Mowbray, Marion C. Robinson (all in person); C. H. Kaye, E. L. Newell (in absentia).

University of Cambridge

The following degrees were conferred on Oct. 19:

M.D.—Elchon Hinden, W. B. D. Malle, H. L. Ellis.

M.B., B.Chir.—M. Q. Birkbeck, E. A. D. Boyd, Rodney Finlayson, B. O. Reed, P. F. C. Jackson, J. H. Jacobs, I. M. Ramsden (by proxy); E. L. McDonald, M. G. Cox (in person).

M.B.—J. L. Morgan (by proxy).

Messrs. Eli Lilly & Co. have undertaken to provide $3500 for research on the relation of radiation to chemotherapy. The work will be carried on in the department of radiotherapeutics, under the direction of Dr. E. Friedmann.

University of London

Dr. M. A. Rushton has been appointed to the university chair of dental medicine tenable at Guy's Hospital medical school. Dr. C. V. Harrison has been appointed to the university readership in morbid anatomy tenable at the British Postgraduate Medical School.

Royal College of Surgeons of England

A meeting of fellows and members will be held at the College, Lincoln's Inn Fields, W.C.2, on Wednesday, Nov. 13, at 5.30 P.M.

The Bradshaw lecture will be delivered on Thursday, Nov. 14, at 5 P.M., by Sir Heneage Ogilvie, who is to speak on Surgical Handicraft.

Ministry of Pensions

Prof. N. Hamilton Fairley, F.R.S., has been appointed honorary consulting physician in tropical medicine to the Ministry.

---

[1] Science versus Cancer. By I. Berenblum, M.D., M.Sc., demonstrator at the Sir William Dunn School of Pathology, Oxford. London: Sigma Books. Pp. 116. 6s.

Board of Control

The Board of Control are returning from St. Annes-on-Sea to London and from Nov. 11 their address will be 32, Rutland Gate, Knightsbridge, S.W.7. (Telephone: Kensington 3456.)

General Board of Control for Scotland

The appointment of Dr. H. B. Craigie as a medical commissioner has been announced. Dr. Craigie is at present deputy superintendent of Whittingham Mental Hospital, Preston.

Reablement in Scotland

The Fitness Centre at Gleneagles Hotel is to be transferred next year to a part of Bridge-of-Earn Hospital. Mr. Joseph Westwood, Secretary of State for Scotland, has decided that reablement shall be available to people from all types of industry, with special recognition of miners' requirements.

Demonstrations in Neurology and Psychiatry

At St. George's Hospital medical school, London, clinical demonstrations in neurology and psychiatry are to be held at 4.30 P.M. on Thursdays, by Dr. Anthony Feiling and Dr. Desmond Curran. The first demonstration will be given by Dr. Feiling on Thursday, Dec. 5.

Demonstrations of Contraceptive Technique

On Thursday, Nov. 7, at 2.30 P.M., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given at the C.B.C. clinic by Mrs. Marie Stopes, D.SC. Medical practitioners may apply for tickets to the secretary, C.B.C., 108, Whitfield Street, London, W.1.

Rural Life Conference

A rural life conference has been arranged by the Church Missionary Society, to be held at High Leigh, Hoddesdon, Herts, from Jan. 7 to 10, 1947. The aim is to further the study of man in relation to his environment. Applications should be directed to the acting secretary, Rural Life Conference, C.M. House, 6, Salisbury Square, London, E.C.4.

Prize for Work on X Rays

The Royal Society of Edinburgh will award in 1947 a David Anderson-Berry medal, together with a sum of about £100, for the best recent work on the therapeutic effect of X rays on human diseases. The last date for applications, which may be based on published and unpublished work, has been postponed to Jan. 31, 1947. Entries should be addressed to the general secretary of the society, 22, George Street, Edinburgh, 2.

Ministry of Health

Dr. G. A. Clark, late professor of physiology and dean of the medical faculty at Sheffield University, has been appointed to the whole-time staff of the Ministry of Health as a principal medical officer.

On the retirement of Dr. R. E. Whitting at the end of August, Dr. C. F. Good became principal medical officer (insurance service). Dr. W. D. Hopkins is now a principal medical officer and Dr. L. M. Ladell and Dr. A. R. Doyle are senior medical officers (insurance service). Dr. E. Martin has retired.

Our annotation on staff organisation in the Ministry (1946, i. 932) should have included the name of Dr. Percy Stocks (General Register Office) as a senior medical officer.

Electroencephalographic Society

The standardisation and interpretation of results was discussed at the society's autumn meeting at the Maudsley and Runwell hospitals on Oct. 4 and 5, when a number of European workers attended. "If we are to attempt to bring electroencephalography to an exact science," said Prof. E. D. Adrian, F.R.S., the president, "it is essential that we formulate common standards and common terms which will form the basis of an international E.E.G. language." The society's primary object is the exchange of information on the science and practice of electroencephalography. It also aims to maintain a high standard in technique and the interpretation of records; to this end it has issued recommendations on the criteria of abnormal records and on the performance of E.E.G. apparatus. It is intended that membership shall be accepted throughout the world as implying a high standard in technique and interpretation. The society is willing to advise any centre or institution. The hon. secretary is Mr. G. Parr, 68, Compton Road, London, N.21.

Causes of Death

The Minister of Health has appointed the following med committee to advise the Government on the forthcom revision of the international list of causes of death:

Sir Ernest Rock Carling, F.R.C.S. (chairman), Dr. C. F. Br Prof. A. J. Lewis, F.R.C.P., Dr. A. H. T. Robb-Smith, Mr. Ear Holland, F.R.C.O.G., Prof. N. Hamilton Fairley, F.R.C.P., Prof. A. Bradford Hill, D.SC., Dr. Percy Stocks, Dr. Mel Mackenzie, Prof. Sydney Smith, M.D., Prof. W. W. D. Thomson,

The present classification of causes of death, first adop by the International Institute of Statistics in 1893, has be revised five times. The next revision, due to be made in 19 and the establishment of an international nomenclature diseases are to be carried out under the auspices of the Wo Health Organisation.

Return to Practice

The Central Medical War Committee announces th the following have resumed civilian practice:

Dr. R. H. DOBBS, 135, Harley Street, London, W.1.

Mr. CHARLES DONALD, F.R.C.S., 66, Harley Street, London W.1 (Langham 2878).

Mr. D. LL. GRIFFITHS, M.B.E., F.R.C.S., 14, St. John Str Manchester, 3 (Blackfriars 9598).

The laboratory chemicals section of the British Drug House Ltd. has been transferred to new works at Poole, in Do leaving more space at Graham Street and Wharf Road London, N.1, for the pharmaceutical and medical side of their work. Inquiries for this section should now be addressed to the B.D.H. Laboratory Chemicals Group, Poole, Dorset. (Tel.: Poole 962.) Mr. Frank Hartle, PH.D., F.R.I.C., secretary of the Therapeutic Research Corporation of Great Britain Ltd., has been appoint manager of the scientific services department of the Br Drug Houses Ltd.

Fifty Indian probationary nurses are to be trained in Sydney metropolitan hospitals. Hospitals in other State capitals may train a further 60 nurses, most of whom will go to Melbourne.

Diary of the Week

NOV. 3 TO 9

Monday, 4th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fi W.C.2
5 P.M. Mr. Terence Millin: Surgery of the Prostate.

Tuesday, 5th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. C. Price Thomas: Surgical Treatment of Pulmon Tuberculosis.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Orthopædics.* Short papers.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION
8.30 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Lady Flo Chemotherapy of Infected Wounds.
LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. R. T. Brain: Electrotherapeutics.
CHADWICK PUBLIC LECTURES
2.30 P.M. (42, Broadway, S.W.1.) Mr. Asa Briggs: Public Opi and Public Health in the Age of Chadwick.

Wednesday, 6th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Prof. R. St. Leger Brockman: Intestinal Obstruction
ROYAL SOCIETY OF MEDICINE
2.30 P.M. *History of Medicine.* Prof. J. J. Izquierdo (Mexico Ci Neglect of Harvey's *De Motu Cordis* in Spanish-speak *Countries and its Recognition after* Three Centuries.
8 P.M. *Surgery.* Prof. John Morley, Mr. C. G. Rob: *Treatmen* Acute Peritonitis.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portl Place, W.1
3.30 P.M. Dr. Brian Russell: Possibilities in the Preventio Disorders of the Skin.

Thursday, 7th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. D. Evan Bedford: Hypertensive Heart Dis (Bradshaw lecture.)
ROYAL SOCIETY OF MEDICINE
8 P.M. (Maida Vale Hospital for Nervous Diseases, W.9.) *Ne logy.* Clinical meeting.
MEDICAL RESEARCH SOCIETY
5 P.M. (University College Hospital medical school.) Dr. W Kolff: Artificial Kidney.
LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. G. B. Mitchell-Heggs: Penicillin in Diseases of Skin.

Friday, 8th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Clinical.* Cases at 4 P.M.
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Mr. S. C. Suggit: Carcinoma of the Larynx and Phary
ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Dr. J. R. Rees: Social Psychiatry and Medical Progr

CHILBLAINS IN SERVICEWOMEN

ALBERTINE L. WINNER
O.B.E., M.D. Lond., M.R.C.P.
LATE LIEUT.-COLONEL R.A.M.C.: HON. MEDICAL CONSULTANT FOR WOMEN'S SERVICES IN THE ARMY

E. S. COOPER-WILLIS
M.A. Camb.
LATE CAPTAIN ARMY GENERAL LIST

IN the winter of 1942 the Auxiliary Territorial Service (A.T.S.) authorities began to receive reports that chilblains were causing a serious loss of efficiency among their personnel; so they asked the medical department of the War Office for help.

It seemed necessary to obtain first some accurate information on the incidence of chilblains, the amount of disablement caused, and the effect of service and employment. An inquiry was carried out by means of a questionary, which was answered by a carefully planned sample of the A.T.S. This questionary was framed by one of us (A. L. W.) with some help from experts, but not, as it transpired, enough. The replies were a sad warning of the dangers of unskilled surveys—questions were misunderstood and stupidly answered, and even when the form was correctly completed the results were impossible to code and compute with certainty. The only thing we got out of this survey was a remarkable list of the remedies which had been found to benefit the sufferers.

This questionary was therefore scrapped and another prepared, this time in conjunction with Major B. B. Swann and E. S. C.-W., both statisticians. The second questionary was issued in the autumn of 1943. It was distributed by the statistical officers at Command Headquarters at home, in close coöperation with the medical and A.T.S. authorities there, and it reached a sample of over 3000 Servicewomen, who completed the form, whenever possible, in the presence of an officer, who dealt with questions about the form and tried to ensure that it was correctly answered. The completed forms * were examined to remove obvious inconsistencies and mistakes, and the remaining forms were sorted and tabulated by Hollerith machinery. The answers to 3003 questionaries were analysed. It was found that the age-distribution of the sample was that of the A.T.S. as a whole, though it had been deliberately selected in that it contained specified numbers of girls in the main jobs.

In assessing the results that follow it should be remembered that the population at risk consisted mainly of healthy young women under 40 (those over 40 were a tiny proportion). Information was not sought from women over 40 or from men. There is, however, a general (but not scientifically proved) impression that male troops have a much lower incidence of chilblains.

Results

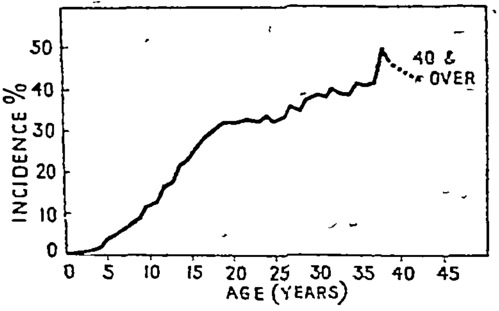
INCIDENCE

We obtained incidence-rates for chilblains at different ages by studying the histories of the girls as given in their replies. We could thus relate the number of girls who said they had started but not yet stopped chilblains at a given age, say 25, to the number of girls who had reached or passed 25 years. This method had two advantages over the more obvious one of relating those at each age who still suffered to the numbers in the sample at each age. First, it enabled us to get incidence-rates for the earlier ages before girls join the A.T.S.; secondly, the incidence-rates obtained are based on larger numbers of cases than those of the simpler method, and hence in that respect are statistically more reliable.

As the figure shows, the incidence of chilblains, as estimated, is much influenced by age. It rises steadily up to the age of 40 or so—in fact, over the whole range of ages for which our sample gives reliable results.

Applying these incidence-rates to the whole A.T.S., we estimated that at the end of 1943 about a third of the women had chilblains in winter and perhaps another sixth had had chilblains at some time in their lives. Thus, of this sample of healthy young women, at least half will have had chilblains before they are 40. The figure of a third agrees fairly well with an estimated incidence of 30% found by the cruder method of relating those who said they suffered in winter to the total of the sample. It seems doubtful how far the rates found among the A.T.S. can be applied to the civil population, especially in peace-time. We cannot say whether A.T.S. service has specifically influenced liability to chilblains, but there is reason to think that the war years have seen an increase in their prevalence. The percentage chances of starting and of stopping chilblains at each age, computed in an analogous manner to that described above for incidence-rates, showed that the chances of starting chilblains are greatest between the ages of 15 and 16, and the chances of stopping them greatest at 20.

Below are shown the results of subdividing our data into two parts, and calculating the chances of starting chilblains, based on the girls' histories up to October, 1939, and similar figures based on the four war years October, 1939, to October, 1943. The rates suggest a considerable increase in the chances of starting chilblains from the age of 18 years onwards during the war period. This increase is not related to war service but to the war years, and starts in the winter of 1939–40, before many had joined up. This confirms the French reports cited below.



Incidence of chilblains from childhood to middle-age, calculated from the replies to a questionary among A.T.S. personnel.

Age (yr.)		*Chance (%) of starting chilblains in one year, estimated from experience—* *(a) Before Oct., 1939*		*(b) Oct., 1939–Oct., 1943*
14 and 15	..	3·5	..	3·6
16 and 17	..	3·2	..	3·3
18 and 19	..	2·0	..	2·7
20 and 21	..	1·2	..	2·6
22–25 ..	..	1·0	..	2·2
26 onwards	..	1·0	..	1·6

LOSS OF EFFICIENCY

Of the 910 girls who had chilblains, 290 (i.e., 32% of them, and 10% of the whole sample) said that their chilblains hindered them in their normal activities, and 213 of these said that their chilblains had sometimes prevented their carrying out certain normal activities.

Normal activity	*Percentage of those who had chilblains*	*Percentage of whole sample*
Dressing and undressing	1	..
Carrying on normal work	6	2
Walking	17	5
Playing games	13	4

These figures, being based on the sufferers' own replies, are unlikely to err on the side of understatement. Hence we may conclude that the amount of serious incapacity and actual interruption of work caused by chilblains was negligible from the Army's point of view. The loss to the sufferer's efficiency, when it fell short of complete incapacity, cannot be estimated from this inquiry.

---

* Copies of this form, and of two other appendices, will be sent to readers who require them. Application should be made, in writing, to the Editor of THE LANCET, 7, Adam Street, Adelphi, London, W.C.2.

INTERVALS FREE FROM CHILBLAINS

We asked whether, and between what ages, sufferers had enjoyed periods of respite from the complaint, but the question was unfortunately misunderstood by many of the girls. As a result we cannot calculate the absolute frequency of such intervals. We can, however, examine their relative frequency at different ages, and this suggests that temporary freedom from chilblains is commonest between the ages of 25 and 30.

FREQUENCY OF CHILBLAINS AMONG RELATIONS OF SUFFERERS

Girls who had chilblains said more often than did girls who did not have chilblains that one or more near relations had also suffered. The differences in the figures given below are suggestive but need not necessarily be interpreted as meaning that there was really an incidence among the relations of sufferers higher than that among the relations of girls who had no chilblains; for sufferers are likely to be more interested in the chilblains of their relations, or else to be informed of them by way of consolation. It is noteworthy that the highest stated incidence—that among brothers and sisters of girls who still suffered—was not much higher than that estimated for the A.T.S. as a whole.

	1646 girls who had never had chilblains	*447 who no longer had chilblains*	*910 who still had chilblains*
A parent suffered ..	4%	10%	20%
A brother or sister suffered	12%	26%	34%
An aunt, uncle, or cousin suffered ..	2%	4%	5%
No near relation suffered	84%	65%	50%

The percentages total more than 100 because some girls said that more than one relation had chilblains.

INFLUENCE OF A.T.S. OCCUPATION ON CHILBLAINS

There is evidence of a definite association between being in certain A.T.S. occupations and having chilblains. The results we found may be summarised as follows (they are discussed in more detail below):

(1) Office workers—i.e., officers and clerks—appear to have been more liable to chilblains than those in other occupations.

(2) Cooking appears to affect chilblains favourably.

(3) Office workers get chilblains more often on their hands and less often on their legs, feet, and ankles than do other girls.

(4) The reverse is true of cooks and other indoor non-sedentary workers—i.e., storewomen, postal workers, and anti-aircraft plotters—whose chilblains are more common on the legs, feet, and ankles, and less so on the hands, than are those of other girls.

(5) There was no evidence that exposure—i.e., in outdoor occupations, such as anti aircraft operational employments—had any effect one way or the other. The only exception is searchlight personnel, possibly the most exposed of all, where the incidence is significantly reduced.

Incidence.—Out of some 21 trades † the actual incidence of chilblains in our sample is above the average—i.e., 30%—among officers, clerks, and drivers of motor vehicles, whereas it is below the average in cooks, teleprinter operators, and searchlight personnel:

	No. of cases
Officers	109 (66%)
Clerks	412 (38%)
Drivers of motor vehicles.. ..	141 (43%)
Cooks	345 (17%)
Teleprinter operators	132 (15%)
Searchlight personnel	100 (16%)

These differences are the only ones we judge to be statistically significant.

The above results should not be too readily accepte as evidence of the influence of occupation on incidence, nor can these percentages be taken as reliable estimat for the A.T.S. as a whole. The samples of each trade ar small and had mostly to be selected from a few units f reasons of economy. Hence we cannot tell whethe the girls are really representative of their trades. We can, however, obtain additional evidence from the answe to the question on how service in the A.T.S. has affecte chilblains. The answers for the 1357 girls who had some period suffered from chilblains were as follows:

No change or no answer	52%
Stopped or better since joining A.T.S.	28%
Started or worse since joining A.T.S. ..	20%

In the absence of any way of telling what would ha happened to these girls if they had not joined the A.T.S we cannot evaluate the effect of A.T.S. service on t whole group. We can, however, compare the relati frequencies of favourable and unfavourable effects on gir in the various trades. We find that officers and clerk have been affected for the worse and cooks for the bett by their service:

	Better	*Worse*	*No of cases*
Officers	14%	42%	83
Clerks	23%	29%	207
Cooks	37%	8%	118

These are the only differences we can accept as statistical significant. We did not examine in detail how far the differences between trades might be due to difference in the ages of the girls in the sample. At the date of th survey over three-quarters of the A.T.S. were between 1 and 26 years old, ages over which the incidence of chil blains did not seem to change much.‡ The largest age differential was expected to be between officers and othe ranks. Correction of the rate for officers for this differenc would only mean a reduction of about 10% in it. More over, the question of the effect of A.T.S. service on chil blains should be very much less affected by age-differen tials than the crude incidence of figures, as the chances o starting and of stopping chilblains are nearly equal ove the relevant range of ages. Hence, where the two tests lead to similar results, we feel fairly confident that age-differences cannot explain the observations.

Sites.—Among the 910 girls who still had chilblains the percentage frequencies of the various sites were as follows:

Feet	48%
Hands	28%
Ankles	13%
Legs	9%
Ears	1%
Other places and no reply ..	1%

We find the following outstanding differences from th above between office workers and indoor non-sedentar workers:

	Officers and clerks	*Cooks, storewomen, plotters, and postal workers*
Hands	34%	19%
Feet, ankles, legs	65%	78%
Elsewhere, &c. ..	1%	3%

EFFECTS OF MENSTRUATION

The monthly period did not make any difference t the chilblains of the 1357 who had ever had them, 1 thought their chilblains were better and 1% worse durin menstruation.

CONDITIONS AGGRAVATING CHILBLAINS

We asked in the questionary whether any of the lis of conditions or circumstances aggravated a girl' chilblains. The percentage frequency of the answers i given below, based on the 910 who still suffer. There did not appear to be any significant difference between trades.

---

† Set out in appendix II (obtainable on written application to the Editor).

‡ Data on the effect of age on chilblains are set out in appendix II (obtainable on written application to the Editor).

Hot-water bottles and sitting by the fire ..	24%
Cold dry weather	19%
Cold damp weather	19%
Tight shoes or gloves	9%
Protracted standing	8%
Exposure to draughts	6%
Being out of doors	6%
Keeping hands wet	5%
Changing from battle dress to Service dress	2%
Unclassified	2%

REASONS FOR CHILBLAINS STOPPING

The reasons given by those who no longer suffered for the cessation of their chilblains did not suggest that in many cases the usual remedies and treatments were found very effective if sought. In more than half the cases the girls did not know why their chilblains stopped, and in only about 26% were the cures ascribed to home remedies or doctors' treatment.

Don't know and no answer	55%
Home remedy or doctors' treatment ..	26%
Change of occupation or moving to another part of the country	19%

TREATMENT USED

The first questionary asked "What have you done for your chilblains that makes them better?" and the replies provided an interesting sample of folk medicine, magic, medical fashion, and the results of patent-medicine advertising. There are 78 remedies suggested, and we list them below as a revelation of the resource and variety which results from the absence of any specific well-authenticated remedy:

Ointments

Zinc ointment
Sulphur ointment
Wintergreen ointment
'Mentholatum' ointment
'Iodex'
Lanolin
Herbalist's ointment
'Snowfire'
'Grasshopper' ointment
'Germoline'
'Zambuk'
'Diamond Chil Cure'
'Nulrose'
'Chilipaste'
'Panacell'
'Zeekol'
'Mystic'
'Lazarus'
'Itsit'

Lotions

Methylated spirits
Surgical spirit
Tincture of iodine
Hydrogen peroxide
Pot. permanganate
Tinct. benzoin co.
Menthol in surg. spirit (14·5%)
Spirits of camphor
Chalk and vinegar
'Sloan's liniment'
'T.C.P.'
'Vick liniment'
'Dettol'
'Milton'
'Cadum'
'Ayrton Saunders C.C.'

Other local applications

Whisky
Lard
'Radox'
Cajuput oil
Castor oil
Camphorated oil
Snow
Turpentine and mustard
'Elastoplast'
'Camphor ice'
Ammonia and opheldeldox
'Antiphlogistine'
Ichthyol
Raw potato
Roasted onion
Onion dipped in paraffin
Paraffin
Urine §

Internal remedies

Halibut-liver oil
'Adexolin'
Calcium
'Calsimil'
Colloidal iodine
Vitamin C
Hay tea
'T.C.P.'

General applications

Hot and cold bathing
Salt-water baths
Mustard baths
Hot water
Ultraviolet light

Other treatments

Eating green vegetables
Eating cheese
Drinking milk
Exercise
Extra clothes
No artificial heat
Woollen coverings
Crêpe soles
Boots
Insoles
Fresh air
Chamois leather

Survey of Literature

The literature of chilblains is enormous and on the whole very unsatisfactory. There are a few classical papers which are really valuable and a great mass of contributions advocating a specific treatment with ætiology adapted to conform with the alleged results. The literature has not been summarised for sixteen years. The best general descriptions are those of Klingmüller and Dittrich (1926–27), Dittrich (1929a), Haxthausen (1930) with very full bibliography, and Buerger (1937). Dubreuilh and Petges (1911) are the main source for rare types and sites.

The first accurate pathological description and the first clear differentiation from frostbite were made by Hodara (1896), but the most important modern histological studies are those of Klingmüller and Dittrich (1926–27) and Dittrich (1929a), who concluded that the essential lesion was an inflammation of the smallest arterioles and capillaries, with hyperkeratosis, thrombosis of the minute vessels, and œdema; they grouped together, under the term "perniosis," ordinary chilblains, cutis marmorata, perniosis folliculata, and erythrocyanosis frigidus. This last condition, seen on the legs (especially of women), has a large literature of its own and is outside the scope of this paper, but most modern writers agree that it is similar to, if not identical with, chilblains.

The main ætiological factor is generally agreed to be cold, but Leduc, (1927) thought chilblains were first-degree burns due to incautious exposure to heat after chilling. An interesting development of this idea is Keining's (1940) distinction between autumn and spring chilblains: autumn chilblains developing mainly in women on hands and feet, due to cold and damp alone; winter chilblains commonest in male agricultural labourers, on the hands, and associated with cold plus the increasing radiation from the spring sun. There is, however, no unanimity about what factors predispose certain individuals to chilblains. Many Continental authorities regard them as manifestations of tuberculosis (Permin 1903, Stephani-Cherbuliez 1936 with excellent bibliography), but most workers now regard the chilblain merely as a *locus minoris resistentiæ* providing good soil for a tuberculous process—e.g. Bazin's disease (Dittrich 1929b, Jausion, Meunier, and Somia 1941). Others have sought to incriminate a dietetic or environmental factor; an "epidemic" of chilblains of abnormal severity was described in Germany during the inflationary period in 1921–22 (Katz 1922) and in France during the very cold winter of 1940–41 (Rabut 1941, Bordet 1941, Jausion, Somia, and Meunier 1941, Mouriquand et al. 1942). Specific dietary deficiencies incriminated have been vitamin P (Jausion, Somia, and Meunier 1941) and vitamin A (Mouriquand et al. 1942).

Other factors blamed have been hypogonadism (Charron 1925), pituitary dysfunction (Lereboullet 1922), focal sepsis (MacKenna 1937), and intestinal toxæmia (Robertson 1920, Savill 1926). Wright (1897) described diminished coagulability of the blood, thus providing the basis for the popular treatment with calcium; but Percival and Stewart (1924) showed that the blood-calcium level was consistently normal, and that no improvement was produced by raising it with parathyroid, and Hallam (1930) could not confirm Wright's findings concerning coagulability.

The present trend, however, is to correlate chilblains with some defect, inherent or acquired, in the peripheral circulation. Dittrich (1929a) regards the histological evidence as in accordance with this, and Hallam (1930) has drawn attention to the association with acrocyanosis. Moreover Barber (1926b) described a case in which the presence of bacterial emboli apparently conditioned the site and onset of chilblains, and Lewis (1941) points out the prevalence in limbs the seat of old poliomyelitis. There is some experimental work tending in the same direction. Ackermann (1936) sought to prove that there was a sympathetic hypotonia ; but, conversely, Brack (1940) thought he had demonstrated vasoconstriction and excessive loss of heat. Dittrich (1929a and b, 1936) and Lippert (1936) considered the essential feature was over-reaction to cold, whereas Lewis (1941) interpreted his experiments as showing a normal reaction to cold in an already abnormally cold skin. Finally Schröder (1944) demonstrated an abnormally slow response to warming in the skin of subjects disposed to chilblains.

---

§ cf. Heinz and von Noorden (1921).

A few other points in the natural history are of interest. The only estimates of general incidence we have been able to trace are those of Hallam (1931), who found that the incidence in 1000 casualty patients was 5·3%, in 1000 medical patients 9·2%, and 1000 tuberculous patients 13·2%. A high incidence in tuberculous patients has also been recorded by Permin (1903) and Stephani-Cherbuliez (1936). Stephani-Cherbuliez (1936) and Hallam (1930) also give age-distribution curves. A familial incidence is mentioned by Barber (1926a) and Watson (1941). Barber (1926b) also makes the interesting observation that sufferers from chilblains are of two distinct types : the stout phlegmatic "lymphatic" type, and the thin nervous type. A peculiar type of "senile chilblain" was described by Meneau (1897), and other rare clinical types by Dubreuilh and Petges (1911), Dubreuilh (1921), and Piechaud and Cazenave (1925). Finally there is a curious and probably highly significant geographical distribution of the literature, which is mostly British, French, German, and Swiss. The only really good American paper is that of Buerger (1937), and all other American papers we have been able to trace deal with rare reactions to cold and not at all with what we understand by chilblains.

The literature of therapy is confused and extensive, and serves only to reinforce the contention that there is no specific remedy. An attempt to review it in detail would take many pages, and it has already been adequately done, by von Noorden (1928) and Haxthausen (1930). All agree that measures to improve the general health are important and that adequate clothing is also essential. The most interesting recent contributions to treatment are the use of sympathectomy (Goldsmith 1936), previously mentioned by Dore (1928), and paravertebral sympathetic block (Simmons 1945) ; the addition of Grenz rays (Goldsmith 1936) to an already impressive armamentarium of physiotherapeutic measures, the revival of passive hyperæmia by Herxheimer (1942), originally described by Mitchell (1926), and the use of vitamins A and P, as previously described. Other recent suggestions have been histamine and bee venom (Watson 1941), fluorescein (Lefevre and Dubarry 1941), and 'Priscol,' (benzylimidazolin) (Brack 1940). All these have their warm advocates, but a scrutiny of the work published over the last forty years inspires only a scepticism and mistrust of all these alleged advances, and a conclusion that the radical and scientific remedy for chilblains has not yet been discovered.

Discussion

The results obtained in this inquiry are not as final and clear-cut as we should have liked, and some of them are not easy to evaluate. Certain clinical conclusions are, however, justified.

It appears that, if the A.T.S. can be accepted as representative of the healthy female population, at least half, at any rate under war-time conditions, will have had chilblains by the time they are 40 years old. It does not appear that these lesions are really disabling except to a very small proportion of women, and the loss of working time involved in the Army was not thought to justify the expenditure of money and man-hours which would have been required either for a scientific investigation into their cause or an elaborate trial of various remedies. The investigation was not, therefore, carried any further except for a very rough trial of one remedy discussed below. However, we are under no illusion about the discomfort, even misery, caused by chilblains which do not actually disable, and the very high incidence seems to require further research when more normal conditions prevail.

The relation to employment, though not conclusive, is suggestive. The general trend is consistent and appears to indicate that (1) office workers are more liable to chilblains than are those whose work is active ; and (2) those whose work is in offices tend to get chilblains on their hands, and those who stand most of the day get them on their feet. This seems to indicate that one factor is circulatory stasis.

The incidence in outdoor workers is certainly not above the average, except for motor drivers, whose work may keep them in one position for long hours. Cold must be a factor, for chilblains as a rule only develop in winter. On the other hand, we are informed by our American and Canadian colleagues that chilblains are almost unknown over there in spite of their bitter winters, and they attribute this to the universal practice of heating (or overheating) their rooms, cars, and trains, and wrapping up really warmly when they go out. Their statements are borne out by the lack of American and Canadian literature mentioned above. Some confirmation of this view is provided by the fact that the only sedentary workers to have a relatively low incidence are the teleprinter operators, whose delicate machines necessitate their offices being kept at a warm and constant temperature. Possibly our national dislike of centrally heated rooms may not be quite so healthy as we fondly think.

The familial factor is suggestive but nothing more, in view of the notorious fallibility of the human memory, and in view of the unobservant character of the average person. This point could only be settled by a large-scale questioning of numerous families, and would be an interesting piece of research for the family doctor who could do much to elucidate the natural history of chilblains.

The apparent increased incidence since the war is not easy to explain. It apparently started from the first winter, long before any fuel or food shortage had made itself felt ; it may be partly related to the very hard winters of 1939–40 and 1941–42, but it is interesting in view of the German findings of 1921–22 and the French reports of 1941–42 mentioned above.

The therapeutic position is wholly unsatisfactory. The fact that 78 remedies had been used, allegedly with success, seems to indicate that none is specific. The basis of most seems to be counter-irritation or the administration of calcium or of vitamin. The use of urine is a fascinating relic of ancient magic, and it would be interesting to know why the onion must be roasted or dipped in paraffin. No-one mentioned thyroid medication, which is surprising, since there is some evidence that both the obese hypothyroid and the thin anxious type are especially liable to chilblains ; indeed few of the numerous remedies mentioned in the medical literature occur in our list.

Therapeutic trials were no part of this investigation, because the difficulties of planning and controlling research on a large enough scale on a condition not found in hospitals were thought at this juncture to be cessive. But one particular ointment was given a ugh and ready trial in various parts of the country:

	Parts		Parts
henol . ..	1·0	Soft paraffin	25·0
amphor	6·0	Hard paraffin	7·5
alsam of Peru ..	2·0	Lanolin anhydrous to ..	100·0

he instructions issued with it were either (1) the affected art to be immersed in hot water at bedtime, dried care- ully, and the ointment applied; or (2) the ointment o be rubbed in night and morning. About 2600 one- unce tubes of this were issued and distributed to rdnance depots, clerical units, and operational anti- ircraft units. The reports from the medical officers vere almost uniformly favourable, many of them stating hat under the influence of the ointment chilblains were ess painful and healed rapidly, some saying that it was the best remedy they had met. We do not, however, deceive ourselves that this is more than an efficient palliative which probably acts by stimulating local circulation.

Summary

An analysis has been carried out on 3003 questionaries filled in by A.T.S. officers and auxiliaries, concerning the incidence and natural history of chilblains.

When the incidence at different ages was calculated, it was found that at least half the women would have had chilblains by the time they were 40 years old.

Actual time lost from work was very small.

The incidence rises steadily up to the age of 40. The most likely age for starting was 15–17, and for stopping 20–22 years. There was also a tendency to have a clear interval between the ages of 25 and 30 years.

There is some evidence that, in this group at least, chilblains have been more prevalent during the war years, though not during war service.

Office workers have a higher incidence than have those in active occupations.

Outdoor exposure does not appear to have any effect.

Office workers tend to get chilblains on their hands, whereas those whose work involves much standing get them on their feet.

There is some indication of familial influence on chilblains.

Very many remedies are reported as having proved beneficial, and it is concluded that none is specific.

The formula of a useful palliative ointment is given.

The published work on the subject is reviewed.

Our thanks are due to Lieutenant-General Sir Alexander Hood, Director-General, Army Medical Services, for his interest and permission to publish this paper; Brigadier R. M. B. MacKenna, consulting dermatologist to the Army, for constant help, stimulation, and advice; Captain C. M. B. Large, late R.A.M.C., who did much of the hard work in preparation and analysis; and the Command statistical officers and others who administered this survey. Last but not least we testify gratefully to the courtesy and helpfulness of the library staff of the Royal Society of Medicine.

FOOTNOTE

Our report was shown to the late Sir Thomas Lewis a few months before his death. He said that, in his opinion, the next part of the investigation should be to determine the critical temperatures and humidities of the environment associated with the onset of lesions; to inquire whether turbulence of air currents in rooms or offices affected the onset; and, more particularly, to determine the temperatures of the extremities of the subjects during the period preceding the onset of chilblains. This last question was designed to discover whether there was a common or an individual temperature below which all persons liable to chilblains would get them. It was not practicable to carry out such investigations under Service conditions, but the suggestions may be of interest to other workers.

(*Bibliography at foot of next column*)

TRAUMATIC PULMONARY ŒDEMA

TREATED WITH CONCENTRATED PLASMA

GAVIN CLELAND
M.B.E., M.B. Edin., F.R.C.S.E.
MAJOR R.A.M.C., SURGICAL SPECIALIST

PULMONARY œdema due to trauma carries a grave prognosis. It was observed not infrequently in battle casualties, and its causes included blast, petrol explosions, chest wounds, fat-embolism, and accidental over-transfusion with either blood or saline. In civilian accidents it is observed in burns due to underground explosions (in miners), in petrol explosions, in accidental inhalation of noxious gases in industry, and in accidental overtransfusion. Except in overtransfusion, accepted methods of treatment are not very successful.

In seeking to control pulmonary œdema due to blast, burns, or chest wounds in battle casualties, I brought into use intravenous concentrated plasma as an addition to the more usual therapeutic measures. The results of this method appeared so striking that I brought the method to the notice of fellow Army surgeons in Italy in February, 1945, in the hope that they would explore more widely its life-saving possibilities. Since that time I have been told by several of my colleagues of success attending the use of the method in their hands. It therefore seems that the method should be brought to general notice in the hope that it may prove as useful in pulmonary œdema due to trauma in civilian accidents as it did in battle casualties.

Pulmonary œdema is characterised by severe respiratory distress and pronounced cyanosis. Large quantities of frothy mucus are thrown up into the trachea and well up through the larynx. According to the degree of consciousness present, attempts are made by the patient to cough up the frothy mucus. Auscultation of the chest detects coarse crepitations throughout which sound very

---

DR. WINNER, MR. COOPER-WILLIS: BIBLIOGRAPHY

Ackermann, A. (1936) *Schweiz. med. Wschr.* 66, 1276.
Barber, H. W. (1926a) *Lancet*, i, 311.
— (1926b) *Ibid*, ii, 1180, 1232.
Bordet, F. (1941) *Pr. méd.* 49, 277.
Brack, W. (1940) *Schweiz. med. Wschr.* 21, 948.
Buerger, L. (1937) Nelson's Loose-Leaf Medicine, New York, vol. II, p. 664.
Charron, L. (1925) *J. Méd. Bordeaux*, 102, 609.
Dittrich, O. (1929a) *Arch. Derm. Syph., Wien*, 137, 1.
— (1929b) *Derm. Wschr.* 89, 1059.
— (1936) *Ther. d. Gegenw.* 77, 20.
Dore, S. E. (1928) *Proc. R. Soc. Med.* 21, 1178.
Dubreuilh, W. (1921) *Bull. Soc. franç. Derm. Syph.* 28, 224.
— Petges, G. (1911) *Paris méd.* 1, 330.
Goldsmith, W. N. (1936) Recent Advances in Dermatology, London, p. 453.
Hallam, R. (1930) *Med. Pr.* 180, 408.
— (1931) *Brit. med. J.* i, 215.
Haxthausen, H. (1930) Cold in Relation to Skin Diseases, Copenhagen and London, p. 56.
Heinz, R., von Noorden, W. (1921) *Dtsch. med. Wschr.* 47, 355.
Herxheimer, H. (1942) *Lancet*, ii, 640.
Hodara, M. (1896) *Mh. prakt. Derm.* 22, 445.
Jausion, Meunier, Somia (1941) *Bull. Soc. franç. Derm. Syph.* 48, 227.
— Somia, Meunier (1941) *Ibid*, p. 219.
Katz, O. (1922) *Klin. Wschr.* 1, 2214.
Keining, E. (1940) *Derm. Wschr.* 110, 26.
Klingmüller, V., Dittrich, O. (1926–27) *Derm. Z.* 49, 1.
Leduc, S. (1927) *Pr. méd.* 35, 91.
Lefevre, P., Dubarry, B. (1941) *Bull. Soc. franç. Derm. Syph.* 48, 217.
Lereboullet, P. (1922) *J. Méd. franç.* 11, 321.
Lewis, T. (1941) *Brit. med. J.* ii, 837.
Lippert, F. (1936) *Derm. Wschr.* 102, 225.
MacKenna, R. W. (1937) Diseases of the Skin, London, p. 291.
Meneau, M. (1897) *Ann. Derm. Syph., Paris*, 8, 502.
Mitchell, L. J. C. (1926) *Med. J. Aust.* ii, 449.
Mouriquand, G., Gaté, J., Cuilleret, P., Bondot, P., Savattier, R. (1942) *Ann. Derm. Syph., Paris*, 2, 425.
Percival, G. H., Stewart, C. P. (1924) *Brit. J. Derm.* 39, 144.
Permin, G. E. (1903) *Hospitalstidende*, 18, Copenhagen (abstracted in *Brit. J. Derm.* 15, 376).
Piechaud, F., Cazenave, E. (1925) *J. Méd. Bordeaux*, 102, 1079.
Rabut, R. (1941) *Pr. méd.* 49, 17.
Robertson, R. (1920) *Prescriber*, 14, 284.
Savill, A. (1926) *Lancet*, i, 415.
Schröder, M. (1944) *Praxis*, 33, 37.
Simmons, H. J. (1945) *Brit. med. J.* ii, 884.
Stephani-Cherbuliez (1936) *Rev. Tuberc., Paris*, 2, 277.
von Noorden, W. (1928) *Münch. med. Wschr.* 75, 691.
Watson, G. I. (1941) *Brit. med. J.* i, 301.
Wright, A. E. (1897) *Lancet*, i, 303.

close to the stethoscope. Danger to life lies in drowning through vast quantities of mucus in the alveoli and bronchial tree.

RATIONALE

I have observed on many occasions that concentrated plasma administered intravenously reduces œdema in second-degree burns, apparently by its direct action in raising the osmotic pressure in the capillaries. If this can be done in traumatic œdema in other parts of the body, it should be possible in pulmonary œdema due to trauma, though not in pulmonary œdema produced by circulatory failure as a terminal event or due to overtransfusion.

It is argued that, by withholding other fluids, the reduction in œdema could be maintained long enough to allow adequate local and general oxygenation to take place, with a resultant return to a nearly normal state of the lung capillaries. This would prevent any tendency for the condition to recur. In cases where pulmonary œdema had not developed but could be expected, the raised osmotic pressure would tend to prevent œdema.

The results described below appear to be compatible with the truth of this thesis.

METHOD

Many of the recognised methods of treatment for pulmonary œdema of traumatic origin are included, for it must be emphasised that concentrated plasma, intravenously administered, is an addition to them, not a replacement of them.

(1) Atropine gr. $^1/_{50}$ is administered intravenously to diminish bronchial secretion to a minimum as soon as possible. It is considered that the atropine can have no direct bearing on the pulmonary condition.

(2) So that maximal oxygenation may take place, as much of the mucus in the bronchial tree as possible must be removed. If the condition has only recently developed and consciousness has not been lost, the patient is encouraged to cough up as much of the mucus as possible. Often, however, the patient is either comatose or semicomatose. If this is so, the patient is laid supine, and the foot of the bed raised, to encourage the mucus to flow towards the larynx. A tube is passed, under direct vision, into the trachea, and the mucus is sucked out. The injection of 'Coramine' 3–5 c.cm. intravenously at this stage will often produce a temporary return of the cough reflex. This will bring still more of the mucus into the scope of the suction tube.

(3) Oxygen is given continuously by a method which ensures the maximal concentration of that gas in the nasopharynx. The B.L.B. mask has proved efficient for this, save in particularly restless and irritable patients, in whom the nasal catheter was used.

(4) The above-mentioned measures are instituted as rapidly as possible, and the administration of concentrated plasma intravenously is begun coincidentally. Originally, double-strength plasma was used (the dried equivalent of 800 c.cm. of human plasma dissolved in 400 c.cm. of sterile water). Latterly, triple-strength plasma has been used (the dried equivalent of 1200 c.cm. of human plasma dissolved in 400 c.cm. of sterile water). The plasma is administered at a rate of about 80 drops a minute, and little difficulty is experienced in maintaining the flow if slight pressure is used. A dose of 400 c.cm. is usually adequate, but occasionally up to 800 c.cm. is required.

(5) Other fluid intake should be limited, to obtain the maximal benefit from the increased protein concentration in the circulating blood.

(6) Should it be proposed to use the method in accelerating recovery from pulmonary œdema as a result of overtransfusion, an adequate venesection is a necessary preliminary to the infusion of the concentrated plasma.

ILLUSTRATIVE CASE-RECORDS

In the following cases the pulmonary œdema was due to various kinds of trauma. This shows the wide application of the method.

CASE 1.—An officer was admitted to a C.C.S. with widespread burns due to a petrol explosion. His general condition was good, but standard-strength plasma was administered by slow drip, because a great quantity of fluid was being lost from the burns.

Operation under continuous 'Pentothal' anæsthesia. All the second- and third-degree burns of face and ears, including the lips and the inside of the mouth, the second- and third-degree burns of both hands, with gloving of the hands, and the second-degree burns of both knees (patient was in shorts at the time of burning) were cleansed and dressed with sulphanilamide powder and soft-paraffin gauze, and the hands were immobilised in the position of function in plaster.

During anæsthesia vast quantities of mucus welled up into the trachea, and patient became very cyanotic despite the administration of oxygen. Pulmonary œdema was diagnosed on the additional evidence of widespread coarse crepitations in the chest. The administration of the anæsthetic agent was stopped, atropine gr. $^1/_{50}$ was given intravenously, and the trachea was sucked out under direct vision. During the latter procedure, burning of the larynx was observed by the anæsthetist.

As the effects of the pentothal wore off, the cough reflex returned, and further quantities of mucus came within the scope of the suction tube. At the same time double-strength plasma was substituted for normal plasma until 400 c.cm. had been administered. This was followed by a slow normal plasma drip. Twenty minutes later, on leaving the theatre, patient's colour was good, and moist sounds in the chest, previously abundant, were reduced to a remarkable degree.

There was no tendency for the pulmonary œdema to recur, and thirty hours later the patient was fit for evacuation to a base hospital.

In this case it was considered that the pulmonary œdema was the result of burns of the respiratory tract.

CASE 2.—A lance-corporal, on admission to an advanced surgical centre, was extremely ill owing to a sucking wound of the right midaxillary line caused by a machine gun bullet, and other injuries.

No details are available of the preoperative infusions administered, but the resuscitation was being carried out by an officer whose realisation of the dangers of transfusion in recent chest injuries was such that he had to be persuaded to give any infusions, and then gave them only very sparingly.

Operation under chloroform and ether followed by ether administered by the Oxford vaporiser (field surgical units did not carry gas-and-oxygen in those days). An obvious sucking hæmopneumothorax was present in the right midaxillary line. The abdomen showed no definite signs of penetration.

The chest wound was laid open and a fracture of the sixth rib found. The soft tissues were excised, and enough of the fractured rib was removed to permit inspection of the pleural cavity. A large hæmatoma of the lower lobe of the lung was seen, and there was no visible rent in the diaphragm. The wound was closed in layers. A perforating wound of the right elbow, related to the chest wound, shattering the lower end of the humerus and the elbow-joint, was excised and immobilised in a padded plaster. A perforating wound of the buttock required no operation. At the end of operation, hæmoptysis was observed.

After return to the ward, patient's condition was extremely grave, and oxygen was administered continuously. During the next three or four hours there was a gradual recovery, and consciousness was regained for a short period. About six hours after operation the patient gradually lost consciousness and appeared to be moribund, and large quantities of mucus welled up into the trachea. Widespread coarse crepitations were heard in the chest.

Treatment was instituted along the lines already described, double-strength plasma being used. The immediate response was dramatic, owing to clearing of the airway by suction followed by administration of oxygen, and over the next half-hour the moist sounds in the chest were observed to be diminishing. This "drying" effect continued, and the œdema did not tend to recur. Consciousness was regained half an hour after treatment was begun.

Five days later patient was fit for evacuation, there having been no further evidence of pulmonary œdema. Six weeks later it was learnt that the chest was considered as healed and only the orthopædic problem of the shattered elbow remained.

CASE 3.—An officer was injured by the explosion of a mine under the jeep in which he was riding. The force of the explosion was such that the jeep disintegrated and large parts of it (and of his fellow passenger) were never found.

On admission to an advanced surgical centre patient was cold, clammy, pulseless, unconscious, and appeared moribund, with a blood-pressure of 50/? The prognosis was hopeless.

The injuries were (1) bilateral blast injury of the lungs, diagnosed on the history, cyanosis, some respiratory embarrassment, and widespread coarse crepitations throughout both lungs; (2) a very large laceration of the sagittal line of the scalp without obvious fracture of the skull, which suggested that his head had met with sufficient violence to cause loss of consciousness; (3) lacerations over the left parietal and occipital regions of the scalp; (4) a traumatic amputation of the right forearm, with shattering of the elbow-joint and fracture of the lower end of the humerus on the same side, with great coincident muscle damage; (5) two penetrating wounds of the right shoulder region; (6) a simple fracture of the left medial malleolus, with much bruising and great displacement of the fragment; and (7) severe contusion of the right ankle.

The blast injuries of the lung were regarded as being of the greatest immediate seriousness. It was felt that there was almost no hope that the patient would become fit to stand operation. Blood-loss had obviously been severe, so blood-transfusion was started slowly because of the chest condition. After two pints of blood had been administered there was no evidence of any response. Pulmonary œdema then manifested itself, pink frothy sputum welling up from the trachea. The depth of unconsciousness was such that the cough reflex was absent.

Treatment was begun with atropine gr. $^{1}/_{50}$ intravenously, tracheal suction, and continuous oxygen. Coramine 5 c.cm. was given intravenously while the tracheal suction was being carried out, and a temporary but helpful return of the cough reflex was obtained. Triple-strength plasma 400 c.cm. was administered at a rate of 80 drops a minute.

In half an hour the colour had notably improved and the pulmonary œdema was disappearing. The cold clamminess of the body had been replaced by general warmth and superficial vasodilatation. The blood-pressure was rising steadily but slowly. Three hours after starting treatment for the pulmonary œdema the blood-pressure had reached 110/80, and the pulmonary œdema did not tend to recur. Semi-coma still persisted. It was now judged to be the suitable moment for operation (eight hours after admission and at least twelve hours after wounding).

Operation, under very light pentothal anæsthesia, consisted of rapid reamputation of the arm through the level of the fracture of the humerus, excision of all other wounds, and rapid one-layer closure of the scalp wound over sulphanilamide powder. The fractured ankle was manipulated and a padded plaster applied.

The condition of the patient did not deteriorate during the operation, but in the next two hours after operation the axillary temperature rose to nearly 105° F, beginning to fall thereafter on the application of cooling measures. This hyperpyrexia could have been the result of a reaction to the plasma or of some injury near the heat-regulating centre, and did not recur.

Ten months later patient was alive and well, having recovered from severe psychological disturbances which were present on his return to consciousness.

CASE 4.*—A sepoy, by the explosion of a shell very close to him, received multiple injuries, including a badly shattered right femur, with very gross and extensive muscle damage, necessitating high thigh amputation.

After operation the breathing became difficult, cyanosis appeared, and the semiconscious patient made poor attempts to cough up the large quantities of mucus in his bronchial tree. Coarse crepitations could be heard throughout the chest. Early pulmonary œdema was diagnosed, and treatment was begun with 400 c.cm. of triple-strength plasma, followed by 400 c.cm. of double-strength plasma. This produced a resolution of the pulmonary œdema, which did not tend to recur. However, patient gradually became more unconscious, despite the absence of external evidence of head injury, and died three days after being wounded.

As the patient was an Indian a necropsy was not done. The differential diagnosis lay between blast injury of the lung and brain, fat-embolism, and a combination of both. In any case naked-eye necropsy in the field would not have established a final diagnosis.

The important fact remains that the pulmonary œdema was controlled and death was due to the cerebral condition.

CASE 5.—A guardsman had been injured by a shell which landed so close to him that, when he came to, he found himself lying on the edge of the shell crater. His only external injury was a tangential laceration of the knee, just involving the joint without damaging the bone.

On admission his breathing was laboured, pulse-rate rapid, and he was slightly cyanosed. No mucus was welling up into his trachea, but high-pitched rhonchi were heard all over the lungs. He was a very much sicker man than his external injury warranted, and he was diagnosed as a case of early and perhaps slight blast injury of the lungs. Later he coughed up a little blood, which tended to substantiate the diagnosis.

He was given 400 c.cm. of triple-strength plasma at about 80 drops a minute. A severe rigor came on after about 200 c.cm. had been given. The rate of administration was diminished and morphine gr. $^{1}/_{4}$ administered, after which the rigor ceased.

Within an hour the cyanosis had disappeared, breathing had become easy, and the general condition had improved. No operation was performed beyond injection of the knee-joint with penicillin and applying suitable splintage. No further anxiety was caused by his chest condition.

This case is described because it is justifiable to suppose that concentrated plasma played a part in averting pulmonary œdema.

COMMENT

It appears clear that the initial improvement in the cases of pulmonary œdema described above can be attributed to the standard measures applied. The outstanding advantage which appears to result from the use of concentrated plasma is the tendency for progressive improvement and the remarkable absence of any tendency for the condition to recur. No case which is described above has required more than one clearing of the trachea by suction.

DANGERS OF CONCENTRATED PLASMA

Reactions of various degrees of intensity may arise, but these do not differ from the reactions which may arise when normal plasma is used to replace plasma loss. Excluding those cases in which bad plasma is used mistakenly, reactions only appear to be really dangerous when a serious hyperpyrexia develops. By careful observation this may be anticipated and the infusion stopped. If, on the other hand, it appears that death is a certainty from the pulmonary œdema unless administration of the plasma is continued, a fresh amount of plasma may be prepared and given through a fresh giving set, and the pyrexia controlled by the usual cooling measures.

In cases where the pulmonary œdema is caused by overtransfusion, an adequate venesection is a necessary preliminary to the use of the concentrated plasma, or the condition will be aggravated. I have seen such a case treated mistakenly with triple-strength plasma without venesection, with aggravation of the condition. This case subsequently responded to venesection when the error was pointed out. I have used it in such a condition, after ordering a preliminary venesection, and been well pleased with the rate of return to normal of the lungs.

---

* This patient and case 5 were treated with concentrated plasma, at my suggestion, by Major D. E. Stephens, S.A.M.C., to whom I am indebted for the case-records.

SUMMARY

Intravenous concentrated plasma has seemed to be a valuable addition to recognised methods in the treatment of pulmonary œdema due to trauma.

Illustrative cases are described.

There has been no tendency for the pulmonary œdema to recur, in the types of cases described, after this treatment.

Apart from the risk of reactions to the plasma, the method is dangerous only if applied, without preliminary venesection, in cases of pulmonary œdema due to overtransfusion.

ACUTE PHOSGENE POISONING

EFFECTS OF PLASMA REPLACEMENT

EXPERIMENTS WITH DOGS AND GOATS

F. C. COURTICE
D.Sc. Sydney, D.Phil. Oxfd, M.R.C.S.
READER IN HUMAN PHYSIOLOGY IN THE UNIVERSITY OF OXFORD

G. L. FOSS
M.A., M.D. Camb.
COLSTON RESEARCH FELLOW 1935–37

From the Experimental Station, Porton, Wilts

DURING the war 1914–18 two types of clinical cases were observed in men exposed to lung-irritant gases: the "blue" case and the "grey" case.[1] The "blue" case showed congested veins and was benefited by venesection. In the "grey" case severe circulatory collapse and leaden cyanosis, with rapid thready pulse, were evident.

In the experiments described by Cameron and Courtice[2] and in other experiments where dogs and goats have been exposed to pure phosgene, signs resembling those of the "blue" case in man have not been seen. As œdema develops, the plasma volume falls, the blood concentrates, the peripheral veins collapse, and the blood-pressure is maintained at first but fails later. Acute phosgene poisoning in these animals thus resembles the "grey" case seen in man.

The logical treatment of such cases of phosgene poisoning would be transfusions of plasma or serum, to maintain the falling plasma volume and so improve the general circulation. The picture is complicated, however, by the fact that the animal is at the same time suffering from anoxæmia due to insufficient oxygenation of the blood in the lungs. The experiments of Cameron and Courtice suggest that, as the lung capillaries appear to be completely permeable to the plasma proteins, any transfusion of a protein solution to improve the general circulation would at the same time increase the pulmonary œdema and so decrease the degree of oxygenation of the blood in the lungs. It was hoped, however, that, by improving the peripheral circulation, the increased blood-flow to the tissues would counteract any decreased oxygenation of the blood in the lungs. The effects of plasma, serum, and concentrated serum were therefore investigated in dogs and goats after exposure to phosgene.

METHODS

Unanæsthetised dogs and goats were exposed to phosgene (440 mg. per cubic metre for various times) in a static chamber and were transfused about sixteen hours after exposure when hæmoconcentration was well marked.

The plasma or serum was given by drip transfusion into a vein in the foreleg. The animal remained quietly on a table during the course of the transfusion, which usually took 30 min. The drip apparatus used for human transfusions in the Army was used. The amount of fluid given was calculated from the rise in Hb % caused by the phosgene before the transfusion began. When four-times-concentrated serum was given, the amount was only a quarter of the calculated plasma loss.

Blood samples were taken from the jugular vein before exposure to phosgene, sixteen hours after exposure, and immediately after, and two, six, twenty-four, and forty-eight hours after transfusion if the animal survived. The Hb % and plasma-protein concentration of the blood samples were estimated, the former by the Haldane hæmoglobinometer, and the latter by microkjeldahl digestion and nesslerisation. The serum or plasma given *did not cause agglutination* of the recipient's cells in any case.

Dog serum and plasma were used in these experiments with dogs, and goat serum and plasma with goats. To obtain the plasma and serum, normal dogs and goats were bled about 20% of their blood-volume by venepuncture of the jugular vein and suction. Strict aseptic precautions were taken. The dog serum was dried by the Army Transfusion Unit and was reconstituted when required as normal or four-times-concentrated serum. The dog plasma and the goat serum and plasma were all used fresh.

RESULTS IN DOGS

In these experiments 13 dogs have been transfused: 5 with four-times-concentrated serum, 4 with normal serum, and 4 with normal plasma. The results of all experiments have been similar.

Four-times-concentrated Serum.—Two dogs were exposed to the phosgene concentration for 10 min. Both were very ill sixteen hours later, with laboured respiration, cyanosis, and collapsed peripheral veins, the Hb of one having risen from 81% to 114%, and the other from 80% to 108%. After transfusion the symptoms became much worse, one dog dying two hours after, and the other seven hours after, transfusion.

Six other dogs were exposed for a shorter time, 6 min., to the same concentration of phosgene. The general symptoms of these dogs sixteen hours later were not so severe as those of the first 2 dogs. Three were transfused with four-times-concentrated serum, and 3 were left as controls. Fig. 1*b* shows the mean results of the two groups. The degree of hæmoconcentration was much the same in both groups sixteen hours after exposure to phosgene. Immediately after transfusion, in the treated group, the Hb % fell slightly, but two hours later it had risen again to a level above that before treatment. Thereafter the level of hæmoconcentration ran parallel with that in the control group. The plasma-protein concentration in the treated group was maintained by the proteins transfused; but, even so, much of the protein injected must have left the circulation. The treated animals were clinically worse after the treatment; but, as the pulmonary œdema was not too severe at the beginning, they all survived in spite of the transfusion. It was felt that, if a second transfusion had been given to try to dilute the blood, death would have resulted.

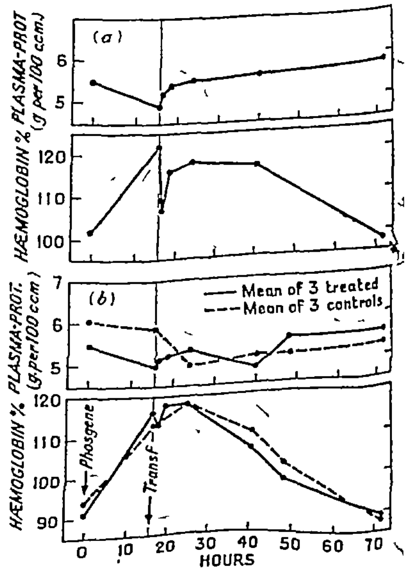


Fig. 1—Effects of transfusion after exposure to phosgene in dogs: (*a*) transfusion with normal serum; (*b*) transfusion with four-times-concentrated serum.

---

[1] Official Medical History of the War, Diseases of the War, 1923, vol. II, p. 393.

[2] Cameron, G. R., Courtice, F. C. *J. Physiol.* 1946, 105, 175.

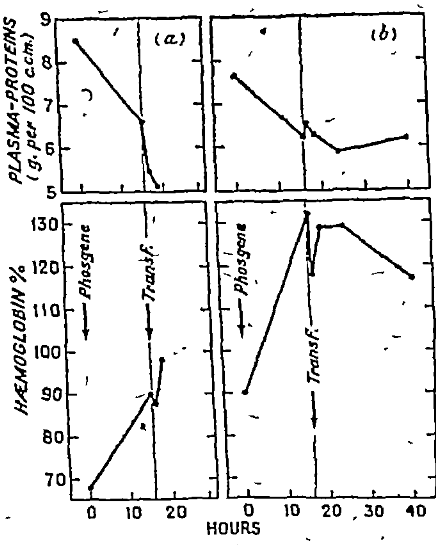


Fig. 2—Effects of transfusion after exposure to phosgene in goats: (a) transfusion with normal plasma; (b) transfusion with normal serum.

Concentrated serum, which contained 22–24% of protein by analysis, therefore had no lasting osmotic effect in withdrawing fluid back into the circulation from the lungs. On the contrary, the fluid, together with the protein it contained, rapidly passed out of the circulation, and presumably some of it passed into the lungs, thereby increasing the degree of anoxæmia.

Normal Reconstituted Serum.—Of the 4 phosgenised dogs transfused with normal serum, 1 died two hours after, and 1 six hours after, transfusion, and 2 survived. In 1 case there was no hæmodilution, and in the other 3 dilution was transient. The general condition of the dogs, as determined by rate and type of respiration, cyanosis of tongue and gums, and sounds in the chest on stethoscopic examination, was worse in all cases after the transfusion. Fig. 1*a* shows the effects in one of the dogs that survived. The plasma-protein level was raised, but the hæmodilution which took place immediately after the transfusion was not maintained.

Fresh Normal Plasma.—Of the 4 phosgenised dogs transfused with plasma, 1 died two hours after the transfusion and 3 survived. Hæmodilution in all cases was transient; and since the condition of the dogs was worsened by the transfusion, it was thought that a further transfusion would have led to death. The plasma-protein level fell even more in all cases after transfusion.

RESULTS IN GOATS

Three goats were transfused with normal plasma and 2 with normal serum. The results of all experiments were similar. Two typical experiments are depicted in fig. 2. The general behaviour of goats closely resembled that of dogs. The transfused fluid had either a temporary effect or none at all in diluting the blood, and the general condition of the animal was always very much worse after transfusion.

DISCUSSION

From all these experiments the following conclusions may be drawn:

(1) The fluid transfused, whether concentrated serum, normal serum, or normal plasma, passed out of the circulation very quickly, depending, on the whole, on the severity of the symptoms before transfusion.

(2) The proteins of the transfused fluids also left the circulation, but serum had a better effect than plasma in maintaining or slightly raising the plasma-protein concentration.

(3) The general condition of the animal was invariably much worse as a result of the transfusion.

(4) It was impossible in very severe cases of phosgene poisoning ever to give enough fluid by drip transfusion to dilute the blood, so rapidly did it pass into the lungs. In less severe cases the dilution of the blood was only temporary after a single transfusion, but the clinical condition of the animal was made much worse; hence a second transfusion would almost certainly have led to death.

This question of transfusion in cases of hæmoconcentration and peripheral circulatory collapse in the presence of pulmonary œdema has arisen in conditions other than phosgene poisoning—e.g., after inhalation of nitrous fumes and other irritant gases. Presumably in all such cases of pulmonary œdema the capillaries of the lungs are affected. The experiments described show that these capillaries allow the passage of the normal plasma of the animal in the first instance, and likewise of the transfused plasma or serum. It was hoped that concentrated serum would, temporarily at least, withdraw some of the œdema fluid by osmotic action, as the transfused serum passes through the pulmonary circulation before the general systemic capillary bed. This hope was not justified by the experiments with dogs. Transfusions in the presence of gross pulmonary œdema are therefore definitely detrimental.

It is possible to have cases of shock due to thermal burns accompanied by only a slight degree of pulmonary œdema due to the inhalation of irritant gases such as nitrous fumes. In such cases great care should be taken if transfusions are given, as it is probable that a non-lethal exposure to a lung-irritant gas can easily be made lethal by repeated transfusions of plasma or serum.

SUMMARY

The effects of transfusions of four-times-concentrated serum and of normal plasma and serum have been investigated in dogs and goats with phosgene poisoning.

The transfusions have no lasting effect in relieving the hæmoconcentration and have a definite detrimental effect by increasing the pulmonary œdema. Transfusions are therefore contra-indicated in the presence of gross pulmonary œdema.

We are indebted to Brigadier Sir Lionel Whitby, of the Army Transfusion Service, for drying the dog serum used in these experiments. Our acknowledgments are also due to the Director-General, Scientific Research and Development, Ministry of Supply, for permission to publish this investigation.

SALT DEFICIENCY IN SPRUE

D. A. K. BLACK
M.D. St. And., M.R.C.P.
MAJOR R.A.M.C.; MEMBER OF G.H.Q. (1) SPRUE INVESTIGATION TEAM AND CENTRAL MILITARY PATHOLOGICAL LABORATORY

It is well recognised that in both tropical and non-tropical sprue the blood-pressure is lower than normal in some patients. Thaysen (1932) found a systolic blood-pressure of less than 100 mm. Hg in 7 of 13 patients with non-tropical sprue. Though a fall in blood-pressure is more common in long-standing cases of sprue, it is also found in some soldiers who contract the disease on war-time overseas service; of 41 soldiers with sprue who had been in India for four years or less, 4 had a systolic blood-pressure of less than 100 mm. Hg and a diastolic of less than 65 mm. Hg. Some such patients show not only hypotension but also signs of peripheral circulatory failure; these form an important group, in spite of their small numbers, for the occasional fatal case of early sprue is drawn from their ranks. The cause of the hypotension presents something of a problem, for in these early cases anæmia has not become gross. Moreover protracted malnutrition cannot be accepted as the sole cause of the hypotension, which may be observed in patients who are not conspicuously wasted in comparison with others who have had the disease for longer periods but whose blood-pressure has remained normal. The present series of observations was directed towards finding some more adequate explanation of the low blood-pressure in this group of patients.

Methods.—The following analytical methods were used:

Serum-sodium: uranyl zinc acetate precipitation.
Serum-potassium: cobalti-nitrite precipitation.
Serum-chloride: Volhard-Harvey titration.
Blood-urea: urease-Nesslerisation.
Plasma volume: vital-red method.

Chloride was determined in urine and stools by the open Carius method; sodium and potassium were determined on ash extracts of stools and urine.

GENERAL CLINICAL FEATURES

The ten patients investigated all had tropical sprue, contracted during their period of service in the India-Burma theatre of war. All of them had steatorrhœa, fat accounting for more than 30% of the dry stool weight. All had lost 10 kg. or more of body-weight. Glossitis was common but not constant. The duration of symptoms was less than a year, and none of the cases showed the severe degree of anæmia which is common in sprue patients coming under observation at a later stage of the disease. The appetite was capricious, and in several cases reluctance to take adequate amounts of food and fluid interfered with therapy; thirst was not complained of. Abdominal distension was general. Two of the patients had profuse watery diarrhœa at the time of investigation, and several others gave a history of diarrhœic episodes, separated by longer periods in which the stools were pale and bulky but well formed. A few of the patients, but not all, had had cramps.

These ten patients were selected from several hundred cases of sprue which passed through the same hospital in 15 months. The basis of selection was low blood-pressure with asthenia. All the patients in the series had a diastolic blood-pressure of 70 mm. Hg or less; the lowest blood-pressure recorded was 74/45 mm. Hg. Though "asthenia" cannot be reduced to quantitative terms, these patients formed in this respect a sharply differentiated group. The great majority of patients with steatorrhœa of a few months' duration are surprisingly well, even though they may have lost much weight; but the patients in our series were listless, lay flat in bed, and were incapable of exertion. The superficial veins were collapsed, and the pulse was thin and rapid. The muscles and subcutaneous tissues were flaccid, and the skin wrinkled, more so than in other patients who had lost a comparable amount of weight. The skin was pale, though they were not anæmic.

TABLE I—BLOOD VOLUME AND ELECTROLYTES

Case	Serum-sodium		Serum-chloride		Serum-potassium		Blood-urea mg /100 ml	Plasma volume		Hæma-tocrit %	Blood-pressure mm Hg
	mg /100 ml	mEq /l	mg /100 ml as NaCl	mEq /l	mg /100 ml	mEq /l		litres	ml /kg		
1	300	130	580	99	..	..	60	2·5	61	37	90/52
2	300	130	545	93	16	4·1	42	3·0	52	36	74/45
3	320	139	608	104	..	..	45	2·2	41	40	88/56
4	310	135	571	98	15	3·8	40	2·2	40	44	92/68
5	315	137	573	98	18	4·6	30	1·9	42	50	96/54
6	304	132	564	96	..	..	50	1·7	34	46	100/60
7	278	121	517	88	20	5·1	45	2·0	44	40	94/54
8	314	136	573	98	22	5·6	54	2·5	46	43	94/60
9	312	135	566	97	20	5·1	29	2·4	46	46	110/68
10	258	112	515	88	20	5·1	36	2·1	53	42	100/70

The following case-record may be taken as representative of the more severely ill patients in the series.

ILLUSTRATIVE CASE-RECORD

A man (case 10), aged 22 years, with a year's tropical service, had had, since 1939, epigastric pain, heartburn, and occasional vomiting after fatty meals. A barium meal had not disclosed any abnormality. No previous diarrhœa, dysentery, or malaria.

TABLE II—BLOOD ANALYSES IN CASE 10

Date	Serum-sodium		Serum-chloride		Blood-urea mg/100 ml	Plasma volume litres	Hæma-tocrit %
	mg/100 ml	mEq/l	mg/100 ml as NaCl	mEq/l			
Sept. 22	258	112	..	..	36	2·1	42
,, 23	296	129	515	88	32	..	..
,, 27	320	139	620	106	40	..	..
,, 29	310	135	612	104	45	..	..
Oct. 1	..	..	..	..	..	2·5	34
Nov. 1	337	146	615	105	24	2·7	41

The serum-potassium on Sept. 23 was 20·2 mg/100 ml. The alkal reserve on Sept. 29 was 47·3 vol/100 ml.

Present illness began in May, 1945, when he was in Eastern Bengal. The onset was sudden, with the passage of copious frothy watery stools. Loss of appetite and abdominal distension were present from the beginning, and he became very weak. Flatulence and abdominal discomfort were prominent symptoms from the onset, whereas tongue signs did not appear until 3 months after the diarrhœa began. He was evacuated to base, and admitted to this hospital on Sept. 20, 1945.

On admission he was severely ill and showed clinical sign of dehydration: dry wrinkled skin, coated tongue, an diminished intraocular tension. Pulse weak and dicrot superficial veins noticeably collapsed. Blood-pressure 100/ fell to 90/65 when the man sat up; pulse-rate 90, rising to 96 on sitting. Appetite poor, but he took fluids well. Tongue painful and reddened at the tip and sides, depapillated, but not fissured. Abdominal distension present, with flatulence Patient passing ten pale fluid copious stools daily.

The patient's weight was 87 lb., his normal weight bei 154 lb. A blood-count showed Hb 12 g./100 ml., red c 3,000,000 per c.mm. A 3-day specimen of fæces weigh 3·5 kg., the dry weight being 239 g. This contained 36% fat, the total output of fat in 3 days being 87 g., of whi 82 g. were split. No mucus or inflammatory exudate w found in the stools.

Progress.—Patient was put on a sprue diet containi 118 g. of protein, 45 g. of fat, and 159 g. of carbohydrate day, the total calorie intake being 1513 a day. This d contains less than 5 g. of salt a day, and it was supplement during the first three days of observation by 5 g. of salt bring the salt content nearer a normal level. Even on t diet, comparatively restricted in salt, the serum-sodium le rose, and concurrently the patient's circulatory state improv so that by Sept. 24, four days after admission, his pulse-r had fallen to 72 per min., and his blood-pressure was 104/ mm. Hg lying, but rose to 110/75 mm. Hg on sitting up.

After three days on a "normal salt" diet the patient w put on a "high salt" diet, with 25 g. of added salt a da this had to be reduced after three days to 15 g., for t patient's appetite became capricious, and he passed increas amounts of watery stools.

Specific sprue therapy with parenteral liver extract w begun, and sulphaguanidine was given in a total dosage 70 g. in four days; the stools became formed within thr days, the wet weight being 300 g. a day.

The general condition improved rapidly, and a month aft the start of treatment the patient's weight had risen fro 87 to 128 lb. His blood-pressure was normal, tongue sig had disappeared, and he felt well, though his stools remain bulky and he was passing 96 g. of fat in three days.

LABORATORY FINDINGS

In table I are given the results of the estimation plasma volume and hæmatocrit, and of serum-sodiu serum-chloride, and serum-potassium in ten patient In the calculation of the plasma volume per kg. t patient's actual weight at the time of estimation has bee used; had the normal body-weight been used, the valu would have been lower by 10% or more.

Seven of the patients had a *plasma volume* of less tha 2·5 litres, and two of them less than 2·0 litres. Five of t patients had a plasma volume of less than 45 ml

The hæmatocrit readings lay mostly between 40% and 6%; but one high value of 50% and two low values of 36% and 37% were observed. Later estimations of the hæmatocrit percentage showed that these normal values did in fact represent a moderate hæmoconcentration: for, when the plasma volume rose with therapy, the hæmatocrit percentage fell to values just below the usual normal limits. The *serum-sodium* values were uniformly low, ranging from 288 to 320 mg./100 ml. (112 to 139 mEq./litre). A control series of five sprue patients with gross steatorrhœa, but with a normal blood-pressure, gave values for the serum-sodium ranging from 318 to 354 mg./100 ml. Moreover, normal values were found for the serum-sodium in four of the patients reported in table I, on whom it was possible to obtain a blood sample after recovery. The *serum-chlorides* were also low, but less markedly so than the serum-sodiums (range 515–608 mg./100 ml., 88–104 mEq./litre). The *serum-potassium* was done in seven patients, and in none of them did it exceed the upper limit of normal. The highest *blood-urea* was 60 mg./100 ml., and in five other patients the blood-urea was over 40 mg./100 ml.

This group of observations indicated that in these patients hypotension and circulatory failure were associated with low serum-sodium and serum-chloride levels, and less constantly with a low plasma volume. They gave no evidence whether the observed sodium deficiency was caused by inadequate intake or by excessive loss of electrolytes, or whether diminished activity of the suprarenal gland might be responsible for the hypotension, as suggested by Thaysen (1932). In the later patients of the series, treatment with salt, either by mouth or intravenously, was followed by the disappearance of the circulatory collapse, and the serum-sodium rather slowly returned to normal levels. The excretion of chloride in the urine was low, of the order of 3–5 g. a day, but chlorides were never absent from the urine The urine and fæces of case 10 were collected over a 15-day period after his admission, and again for a 3-day period after he had completely recovered from dehydration, but while he was still passing large amounts of fat in the fæces. Tables II–V give the results of blood, urine, and stool analysis, and the mineral intake and output for corresponding periods.

TABLE III—URINE ANALYSES IN CASE 10

Period	Vol. ml	Sp gr	Sodium		Chloride		Potassium		Urea g	Urea clearance: % of average normal
			g	mEq	g	mEq	g	mEq		
1	3135	1·012	0·14	6·1	4·7	132	0·12	3·1	57	80
2	4415	1·012	0·31	13·5	14·6	412	1·06	27·2	59	63
3	3000	1·010	0·21	9·1	10·2	288	0·68	17·4	40	46
4	4830	1·006	1·03	44·8	8·6	242	0·65	16·7	44	50
5	3640	1·007	1·08	47·0	9·2	259	0·75	19·2	97	85
After	7570	1·031	17·5	762·0	30·5	860	3·0	77·0	53	86

All periods are of three days, and the figures for sodium, chloride, potassium, and urea represent the total excretions in each period. Periods 1–5 are consecutive, starting from Sept. 22; the "after" period was the three days Nov. 12–14, at which time the patient had a normal blood-pressure but was still passing fatty stools.

The blood estimations (table II) showed a low serum-sodium level which rose rapidly when salt was added to the diet. The serum-chloride level was not so low as the serum-sodium initially, and it rose to within normal limits more rapidly. The initial plasma volume was lower than the value obtained after recovery, but the difference was not striking. The hæmatocrit percentage fell when dehydration was corrected, and later rose again to a normal value as the patient's general state improved. The blood-urea level during the dehydration period lay within the normal range but was higher than after recovery; Kirsner et al. (1943) comment on the fact that blood-urea may show little increase in moderate degrees of salt deficiency. However, the urea clearance (table III) was depressed at the time when the blood-urea level was highest, and the 3-day output of urea also fell. Comparison of the results in table II with the clinical data in the appended case-record on patient 10 shows that correction of the anomalous blood findings was attended by only partial clinical improvement. The pulse-rate fell, the blood-pressure rose, and the peripheral circulation improved. There was some gain in weight, but the patient continued to pass very large fluid stools, his appetite was poor, and he felt no better. It was obvious that salt deficiency had been responsible for only a part of the complex clinical picture, and rapid improvement in his general condition took place only after he was treated with sulphaguanidine and parenteral liver.

TABLE IV—FÆCAL ANALYSIS IN CASE 10

Period	Wet weight g	Dry weight g	Total fat g	Sodium		Chloride		Potassium	
				g	mEq	g	mEq	g	mEq
1	3520	239	87	4·6	200	1·2	34	1·0	26
2	9155	277	118	8·9	387	8·1	228	1·8	46
3	6130	220	71	9·0	392	4·0	113	4·9	126
4	3550	136	49	3·4	148	2·1	59	2·0	51
5	910	113	40	0·8	35	0·4	11	2·8	72
After	1225	265	96	0·5	29	0·03	1	4·1	105

MINERAL BALANCE AND EXCRETION

There was retention of sodium, chloride, and potassium throughout the first observation period of 15 days. In the case of sodium and chloride, this took place on dietary intakes varying from less than 10 g. to more than 20 g. of sodium-chloride a day, even though abnormal amounts of sodium and chloride were being lost in the stools. The retention of sodium and chloride was accompanied by a rise in their serum concentrations. In the after-period of three days the patient was in sodium balance and was excreting rather more chloride than he took in; there was still a retention of potassium, which may have been related to the fact that he was still putting on weight rapidly. Though the dietary intake of sodium and chloride, when expressed in milli-equivalents, was approximately equal, more sodium than chloride was retained, except during period 1, when the patient was on a diet containing less than 10 g. of salt a day. This suggests that in the period before our observations,

TABLE V—INTAKE AND OUTPUT OF ELECTROLYTES IN CASE 10

Period	Intake						Output					
	Sodium		Chloride		Potassium		Sodium		Chloride		Potassium	
	g	mEq	g	mEq	g	mEq	g	mEq	g	mEq	g	mEq
1	10·1	440	16·7	470	10·3	264	4·6	206	5·9	166	1·1	29
2	27·8	1210	43·0	1210	9·9	254	9·2	401	22·7	640	2·9	73
3	20·0	870	31·2	852	7·9	206	9·2	401	14·2	401	5·6	143
4	12·8	557	20·0	563	4·2	108	4·4	193	10·7	301	2·7	68
5	10·9	474	17·9	504	8·8	226	1·9	82	9·6	270	3·6	91
After	18·2	792	28·4	800	11·0	282	18·0	791	30·5	861	7·1	182

The potassium intake was derived entirely from the food, and its variability was due to the patient's having been unable to take different items of the measured diet at different times. The sodium and chloride were derived partly from the diet, and partly from supplementary sodium chloride, to the amount of 5 g/day in period 1, 25 g/day in period 2, 15 g/day in period 3, and 10 g/day in periods 4 and 5 and the "after" period.

when salt deficiency was actually developing, loss of sodium had exceeded loss of chloride. Even in the observation period loss of sodium in the stools was much greater than loss of chloride; and normal intestinal secretion is known to contain more sodium than chloride (Gamble et al. 1945). The total loss of sodium and chloride in the stools was greatly in excess of the negligible amounts found in normal stools. Even in the after-period, though chloride was practically absent from the stools, they still contained 0·5 g. of sodium in three days; at this stage the stool was still bulky and contained much fat, but the ratio of dry to wet weight was within normal limits. The greater loss of sodium than of chloride in the stools was clearly reflected in the urinary excretion of these ions. In the first observation period the urine contained only 6·1 mEq. of sodium in 3 days, whereas in the same time 132 mEq. of chloride was excreted. After some days on diet with added salt, the chloride output in the urine was still more than five times as great as the sodium output. Only in the after-period were sodium and chloride excreted in equivalent amounts. These findings indicate that salt deficiency in this patient was complicated by acidosis; the kidneys conserved base rigidly but continued to excrete chloride in significant amounts. Further evidence of acidosis may be found in the alkali reserve of 47·3 vol./100 ml. and in the finding of 113 mEq. of ammonia plus titratable acidity in one 24-hour specimen of urine.

DISCUSSION

The clinical and laboratory findings in these patients are those of dehydration due to salt deficiency. Similar episodes of dehydration are not uncommon in cœliac disease, and Prunty and Macoun (1943) describe a case of non-tropical steatorrhœa with hypotension and low serum-sodium and serum-chloride levels. The comparative frequency of salt deficiency as a complication of tropical sprue does not seem to have been appreciated, for electrolyte studies in this disease have been almost confined to calcium and phosphorus metabolism.

The chief cause of salt deficiency in these patients is almost certainly the loss of sodium and chloride in the bulky, often fluid, stools. It may be left an open question whether the sodium and chloride in the stools represent unabsorbed dietary salt, or intestinal secretion which has not been reabsorbed in the usual way. The greater loss of sodium than of chloride suggests that intestinal secretions form a large part of the fluid stool. On the other hand, increasing the intake of saline fluid in case 10 was followed by a threefold increase in the bulk of the stool, which decreased again when the saline intake was reduced. Visscher et al. (1944) have shown that absorption of sodium, chloride, and even water is not a simple process of diffusion, but may differ by 200-fold from rates calculated from concentrations of these substances; and it is not impossible that an active process of this kind should be impaired in severe sprue, or even in chronic starvation. Although diarrhœa is the main cause of salt deficiency in these patients, the salt intake is also concerned; anorexia interferes with the intake of salt and salt-containing foods, and thirst is relieved by fluids which contain little or no salt. Our observations suggest that adrenal insufficiency, suggested by Thaysen (1932) as a cause of hypotension in steatorrhœa, was not an important factor in our patients. No increase in the serum-potassium was observed; and in case 10 sodium was adequately retained by the kidneys. Moreover, Prunty and Macoun (1943), in their case of salt deficiency in idiopathic steatorrhœa, found no biochemical evidence of adrenocortical deficiency. Sprue patients with hypotension do not respond clinically to therapy with desoxycorticosterone acetate (Leishman 1945).

Therapeutic Implications.—When the likelihood of salt deficiency in cases of sprue with profuse diarrhœa is appreciated, much can be done in the way of prophylaxis. The diets normally used in the treatment of sprue are of no more than average salt content, and they require to be supplemented by the liberal addition of salt in cooking and seasoning, in any patient who develops diarrhœa. When anorexia interferes with the intake of food, it becomes even more important to give salt besides fluid. Skimmed milk, which forms a high proportion of the early sprue diet, contains less than 0·2 g. of salt per 100 ml.; the addition of 0·3 g./100 ml. (1·5 g. per pint) is well tolerated. Orange-juice and lemon-juice, fortified by 0·45 g. of salt per 100 ml., are suitable as drinks, and we have found that sprue patients take them well. A daily intake of 15 g. of salt should be aimed at in the sprue patient with diarrhœa in the tropics; the actual food in a sprue diet supplies only 5 g. of this, and the remaining 10 g. has to be added in seasoning and in weak saline drinks.

In established salt deficiency more intensive salt therapy by mouth has to be given. Though these patients do not usually complain of thirst they take saline fluids well. The limit to the amount of saline fluid which can be given by mouth is set by increase of diarrhœa, and improvement on oral therapy may take some days. In only one patient of this series was it necessary to give saline by vein. Even more important than replacement therapy is the necessity of cutting short the watery diarrhœa which is present in nearly all these patients. Though the stools have not shown the exudate of bacillary dysentery, sulphaguanidine has been found effective in four patients of this series whose diarrhœa did not respond to diet and rest in bed. Parenteral liver should also be given as part of the general treatment.

With treatment on the lines suggested, all the patients in this series made a good recovery from their acute state of circulatory insufficiency. The stool fats, as might be expected, were not restored to normal, though they became less when diarrhœa was arrested. The patients were, however, brought from a state in which they seemed likely to succumb to one in which routine therapy for sprue could be applied and take effect.

SUMMARY

Between 5% and 10% of patients with sprue acquired on military service have had a low blood-pressure, asthenia, and signs of peripheral circulatory failure.

Ten such patients had low serum-sodium and serum-chloride levels, and in some cases a plasma volume which was low in relation to body-weight. Of these abnormalities the low serum-sodium level was the most pronounced.

A balance experiment on a typical patient showed abnormal loss of sodium, and to a less extent of chloride, in the fæces; in the urine, sodium was rigidly conserved, while chloride was excreted, though in amounts less than normal.

When the patient was put on a high intake of salt, sodium and chloride were both retained, and the serum-sodium and serum-chloride rose to normal levels; the blood-pressure rose, and clinical signs of dehydration disappeared, though the abnormal loss of fat in the stools was not affected.

It is considered that such patients show the clinical and biochemical pattern of salt deficiency, modified by some degree of acidosis, owing to the preponderant loss of sodium over chloride in the stools.

Loss of electrolyte in copious watery stools is thought to be the main cause of the salt deficiency, but diminished intake of salt in anorexic patients is also a factor.

The results reported do not suggest adrenal insufficiency, for the serum-potassium was not increased, and conservation of base by the kidneys was adequate.

Treatment by increasing the salt intake to 15 g. a day corrects the dehydration in a few days, and intravenous saline had to be given in one patient only.

If watery diarrhœa does not respond to diet and rest in bed, replacement salt therapy should be supplemented by sulphaguanidine, which has been found to check this type of diarrhœa.

I am indebted to the Director of Medical Services in India for permission to publish this paper, and to Colonel R. N. Phease, Officer Commanding Central Military Pathological Laboratory. The patients described were under the care of Lieut.-Colonels W. C. Smallwood and K. D. Keele, R.A.M.C., whose coöperation and interest in the work are much appreciated. I am grateful to Prof. R. A. McCance for many valuable suggestions both in planning and interpretation.

REFERENCES

Gamble, J. L., Fahey, K. R., Appleton, J., MacLachlan, E. (1945) *J. Pediat.* 26, 509.
Kirsner, J. B., Palmer, W. L., Knowlton, K. (1943) *J. clin. Invest.* 22, 95.
Leishman, A. W. D. (1945) *Lancet*, ii, 813.
Prunty, F. T. G., Macoun, S. J. R. (1943) *Brit. J. exp. Path.* 24, 22.
Thaysen, T. E. H. (1932) Non-tropical Sprue, London.
Visscher, M. B., Fetcher, E. S. jun., Carr, C. W., Gregor, H. P., Bushey, M. S., Barker, D. E. (1944) *Amer. J. Physiol.* 142, 550.

MYOCARDIAL FIBROSIS FOLLOWING ARSENICAL THERAPY

REPORT OF A CASE

J. R. EDGE
M.D. Leeds
FORMERLY RESIDENT MEDICAL OFFICER, PINDER FIELDS EMERGENCY HOSPITAL, WAKEFIELD

This case is reported in view of the rarity of focal myocarditis following arsenical treatment. I have not been able to discover any report of a case in which a patient recovered from arsenical coma and later died of chronic congestive heart-failure, apparently also due to arsenicals.

A man, aged 41, stationed in West Africa, noted a penile sore on Oct. 25, 1944. On Nov. 25 the sore was still present. Kahn reaction + + +. He started a course of weekly injections of neoarsphenamine; the sixth and last injection of the series was given on Dec. 28, 1944, and the sore healed.

On Jan. 26, 1945, a further injection of neoarsphenamine was given, and on the 29th he reported sick with malaise, headache, and weakness in both hands. On the 30th he became restless and irritable and rapidly lapsed into coma, responding only to painful stimuli. Temperature 102° F, very restless, tongue dry. No neck-rigidity. Fundi: veins congested, otherwise no abnormality. Cranial nerves normal. Apparent weakness of left arm and leg. Tendon jerks present and equal. Plantar responses flexor. An attempt at lumbar puncture failed. Given quinine gr. 10 t.i.d. (no record of blood films available).

On Feb. 2 his general condition had improved, but he was still unable to answer questions. Left arm and leg spastic, abdominal reflexes absent, both plantar responses extensor. By the 19th he could coöperate normally, but had no memory of events for the previous three weeks. The left arm was spastic, with greatly increased tendon jerks; coördination impaired in both arms. Abdominal jerks absent. Leg jerks equal; power and coördination normal; plantar responses flexor. He was slightly breathless at rest in bed, with œdema of the legs and sacral cushion. Heart not enlarged clinically; sounds faint; pulse of poor volume; blood-pressure 105/80 mm. Hg.

On May 19 orthopnœa increased, jugular veins overfilled and pulsating, œdema still present, liver enlarged, crepitations at both lung bases.

On June 16 he was admitted to Pinder Fields Hospital. He had no previous history of rheumatism; in spite of twelve attacks of malaria in two years, he said that he was in robust health until just after the injection of neoarsphenamine on Jan. 26, 1945. He had been a heavy beer drinker. His relations had noted no change in personality.

On examination: a coöperative patient, with moderate cyanosis of nose, ears, hands, and feet; breathing slightly laboured at rest in bed; veins of neck full to angles of mandible; pitting œdema of ankles and over sacrum; liver enlarged to percussion; spleen not palpable. Pulse-rate 110 per min., pulse regular but of poor volume; arteries not palpable; blood-pressure 115/90. Apex-beat diffuse; cardiac dullness extended 5½ in. to left of midline. Sounds faint; third heart sound present at apex; pulmonary second sound slightly increased; constant soft apical systolic bruit. Moist crepitations at bases of both lungs.

Central nervous system: residual spastic paresis of both arms, greater on the left, with grossly exaggerated tendon jerks and severe incoördination. Abdominal jerks absent: leg jerks present and equal; plantar responses flexor. No evidence of peripheral neuritis. Fundi: veins congested, otherwise no abnormality.

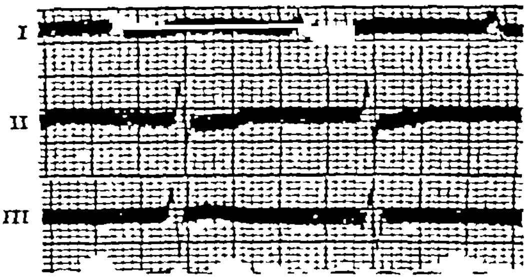


Fig. 1—Electrocardiogram: limb leads, showing small voltage, and diphasic flat T wave in leads I and II.

Radiography of chest (July 4) showed gross general cardiac enlargement: aortic arch normal; severe hilar and pulmonary congestion, especially at base of right lung. No evidence of tuberculosis.

Blood-count (July 4): Hb 86%, red cells 5,300,000, white cells 16,000 per c.mm. (polymorphs 41%, lymphocytes 18%, monocytes 4%, eosinophils 37%). Subsequent counts showed that the eosinophilia was maintained. Films persistently negative for malarial parasites.

Other investigations: test-meal showed acid secretion slightly below normal; stools repeatedly negative for parasites; no abnormalities in urine. Electrocardiogram showed a very small voltage in all limb leads, with a diphasic flat T wave in leads I and II (fig. 1). In the chest leads (fig. 2) the main deflection was downwards, and C.F.5 showed notching of the ventricular complex. Blood Wassermann and Kahn reactions on July 4 and August 1 were negative.

Diagnosis.—He presented the picture of chronic myocardial impairment without hypertension or evidence of rheumatic disease. Electrocardiography showed no evidence of bundle branch block or posterior wall infarction. Beriberi heart was a possibility. It seemed difficult to associate the condition with syphilis.

Treatment and Progress.—The congestion was slightly improved after treatment with mercurial diuretics; the pulse-rate dropped to 90 per min. Full doses of digitalis and intramuscular injections of 'Benerva' 50 mg. daily for fourteen days had no effect. His condition did not alter until early in August, when he developed a low-grade bronchopneumonia; the œdema then increased, and he became progressively drowsier and died on August 18. The pulse remained regular throughout.

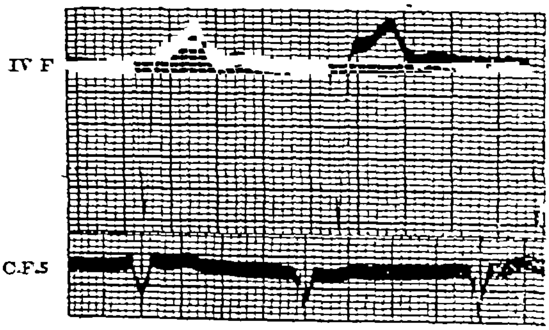


Fig. 2—Electrocardiogram: chest leads, showing main deflection downwards. C.F.5 shows notching of the ventricular complex.

NECROPSY

There was gross œdema of the legs, genitalia, and sacral cushion; no skin petechiæ. The peritoneum contained abundant clear fluid, and there was a large clear pleural effusion on the left side.

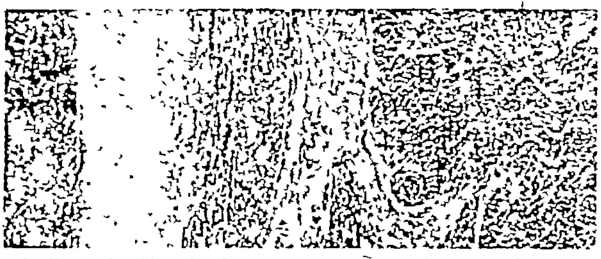


Fig. 3—Extensive fibrosis of myocardium, dense subendocardial fibrosis, and adherent mural thrombus. (H. and E. × 14.)

Heart weighed 520 g. Pericardium normal. Generalised dilatation of both ventricles; walls not thickened. Heart muscle pink and flabby; two minute fibrous scars in wall of left ventricle. Endocardium lining both ventricles greatly thickened, apical third of left ventricle being completely filled with greenish-red adherent thrombus; no thrombus found in any other chamber. Valves healthy; coronary arteries normal except for a small patch of atheroma $^1/_2$ in. from beginning of left coronary; aorta likewise healthy except for two small patches of atheroma in ascending part.

Lungs: left lower lobe collapsed; much congestion with terminal bronchopneumonia. No infarcts seen; no evidence of tubercle other than a thick adhesion at right apex.

Liver weighed 1950 g., with characteristic nutmeg changes. Spleen weighed 420 g.; capsule tense; pulp very firm, fibrous, and intensely congested. *Kidneys* congested; no infarcts. *Brain* œdematous; cut surface exuded free fluid; no other abnormality; no evidence of old thrombosis. *Intestines:* no parasites found.

Microscopical Examination.—Heart showed extensive focal myocardial fibrosis, evidently the result of complete healing of an antecedent necrotic process. The scars were very telangiectatic, and there was much hæmatogenous pigment in phagocytes. There was very dense subendocardial fibrosis, with firmly adherent mural thrombus, showing early organisation (see figs. 3–5). Silver technique revealed no spirochætes. *Spleen* much congested; excess of melanin pigment. *Brain:* sections from cerebellum, gyrus rectus, and thalamus revealed no abnormality. Unfortunately the rest of the brain was discarded before further sections could be taken.

DISCUSSION

Ransome et al. (1945) have suggested that some cases of arsenical encephalopathy are really cerebral malaria. Though the patient had previously had twelve attacks of malaria, the onset of symptoms shortly after an injection of neoarsphenamine, given at a month's interval after a previous course, is in keeping with arsenical encephalopathy (Rabiner et al. 1943). Congestive heart-failure was found as soon as the patient recovered from the encephalopathy. A cerebral vascular accident, due to meningovascular syphilis, is improbable, especially in view of the normal appearance of the brain post mortem.

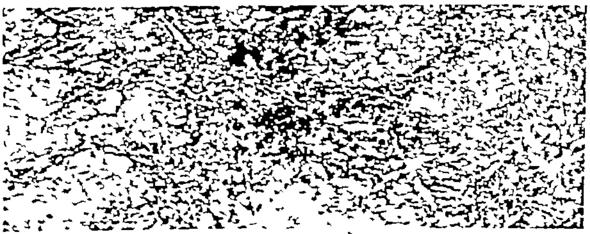


Fig. 4—Focus of fibrous tissue. (Mallory × 40.)

The most likely sequence of events therefore seems to be that at the same time as the encephalopathy developed there was acute focal necrosis of the heart muscle, neither process being sufficiently severe to kill the patient immediately. After regaining consciousness he lived seven months, during which the necrotic areas in the heart muscle became completely fibrosed. The persistent eosinophilia is of interest, as it is thought to have an allergic basis (Brown and McNamara 1940); no ca for it was discovered.

There was never any direct evidence of vitamin complex deficiency in this case. Since treatment w started exactly a month after the appearance of th chancre, and there was never any evidence of secondar syphilis (the patient was infected in Africa), the pos bility of syphilitic myocarditis (Warthin 1925) is remo

Brown and McNamara (1940) collected 7 cases o acute interstitial myocarditis following arsenical therap and added a case of their own; all these cases occurre in the course of exfoliative dermatitis and were rapidl fatal. They describe exudate, hæmorrhage, and minut foci of muscle necrosis, with heavy infiltration of whit cells, mainly eosinophils; the blood-vessels were normal, and the necrosis was not perivascular.

Smith and Furth (1943) describe 3 cases of fibrosis o the endocardium and myocardium ("Fiedler's myocarditis") in which there was gradually progressive congestive heart-failure of obscure ætiology for 8 years, 9 months, and 8 months respectively. The clinical, pathological, and histological findings were strikingly similar to those in the present case. A common feature was the great weight of the heart, which in the present case could presumably be accounted for by the large thrombus in the left ventricle and by hypertrophy of the severely damaged myocardium called upon to work for seven months. There was no history of any of these patients having had either syphilis or arsenical treatment, and in all there was evidence of long-continued dietetic insufficiency. Smith and Furth postulate vitamin-B complex deficiency as the probable cause; they review previously reported cases of Fiedler's myocarditis and suggest that the condition is probably a variant of beriberi heart.

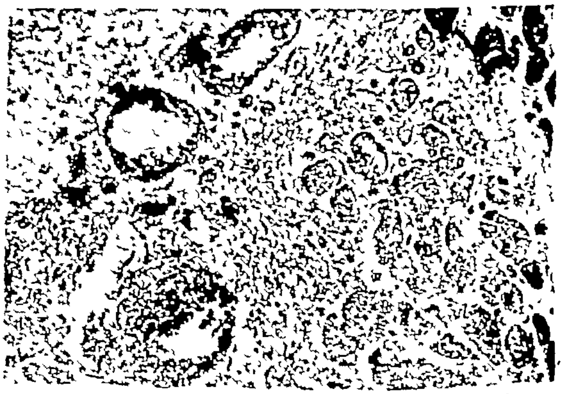


Fig. 5—Dilatation of blood-vessels within an area of scar tissue. (H. and E. × 250.)

In the nervous system the commonest findings in arsenical encephalopathy are small perivascular hæmorrhages, œdema, plugging of capillaries, and perivascular necrosis (Wilson 1940). There is also evidence of primary necrosis of nerve-cells; Rabiner et al. (1943) describe a case in which fatal cerebral symptoms developed after 'Mapharsen'; they found discrete acellular areas of focal necrosis, as well as diffuse necrosis with astroglial reaction, in the cerebrum. These lesions were distinct from the vascular lesions usually described. Lichtenstein (1942) describes primary cell degeneration, with proliferation of the astroglia, in cases of postarsenical myelitis.

Lydon (1944) argues that primary cellular damage, as opposed to vascular damage, is the essential lesion in arsenical encephalopathy. He believes that nerve-cells, being highly developed, are the most susceptible to damage, but thinks it possible that other tissues may be similarly affected; he describes changes in the liver in a fatal case, without jaundice, possibly due to arsphenoxide, 'Mapharside.' He draws attention to similarities between arsenical and Wernicke's encephalopathies, and suggests that vitamin B_1 is a reasonable prophylactic and therapeutic agent in both conditions. He suggests that "the administration of arsenic calls for excess of some other factor necessary for efficient cell metabolism."

Focal myocardial necrosis may evidently follow either arsenical therapy or chronic nutritional deficiency. Brown and McNamara (1940) suggest that in post-arsenical cases the lesion is a primary cellular necrosis; the findings in the present case appear to represent the end-result of such necrosis in a case which survived.

Severe arsenical reactions may be more widespread than is usually realised; further observation is required to determine whether there is any relationship between nutritional deficiency and arsenical reactions.

It is suggested that in fatal cases of arsenical encephalopathy organs other than the brain should be examined histologically more often.

SUMMARY

A fatal case of focal myocardial fibrosis is described n which the evidence suggests that the lesion was due o neoarsphenamine. The heart lesion manifested itself n the patient's recovery from arsenical encephalopathy.

My thanks are due to Dr. W. D. Forsyth, medical superintendent of Pinder Fields Hospital, and Dr. H. H. Moll, onsulting physician to the hospital, for permission to publish his case; Dr. J. D. Spillane for his opinion on the nervous esion; Prof. M. J. Stewart for his opinion on the slides and or reading the proofs; and Mr. R. J. Manby, of the University f Leeds, for the photomicrographs.

REFERENCES

Brown, C. E., McNamara, D. H. (1940) *Arch. Derm. Syph.* 42, 312.
Lichtenstein, B. W. (1912) *Arch. Neurol. Psychiat.* 48, 740.
Lydon, F. L. (1944) *Brit. J. vener. Dis.* 20, 87.
Rabiner, A. M., Freiman, I. S., Apter, N. (1943) *Arch. intern. Med.* 71, 836.
Ransome, G. A., Paterson, J. C. S., Gupta, L. M. (1945) *Brit. med. J.* i, 659.
Smith, J. J., Furth, J. (1943) *Arch. intern. Med.* 71, 602.
Warthin, A. S. (1925) *Amer. Heart J.* 1, 1.
Wilson, S. A. K. (1940) Neurology, London.

Medical Societies

LIVERPOOL MEDICAL INSTITUTION

At a meeting of the institution on Oct. 24, with Dr. G. F. **Rawdon Smith**, the president, in the chair, a symposium on the

Use and Abuse of Sulphonamides

was opened by Dr. **Douglas Riding**, who dealt with the subject from the biological and physicochemical aspects. While he appreciated the tremendous value of the sulphonamide drugs to the clinician, as a pathologist he was disturbed by the potentialities for abuse in the new chemotherapeutic agents. In spite of our imperfect knowledge of disease processes, immunology, and enzyme chemistry, intelligent use of the sulphonamides might well mean the difference between death and life for patients suffering from such desperate conditions as puerperal sepsis, pneumococcal infections in the elderly, and cerebrospinal fever. What he deplored was "unscientific, indiscriminate, and mass bombing of every inflammatory battlefield with the sulphonamides." He then discussed the chemistry of the sulphonamides, with particular reference to the changes in pharmacological action brought about by modification of the essential groupings in the sulphanilamide molecule. Speaking of specific metabolite antagonists, he remarked that one could hardly hope to dabble in the fields of pharmacology and chemotherapy without some knowledge of the effects of competitive and non-competitive inhibitors on the velocity of enzymatic reactions. "A sulphonamide drug," he concluded, "is a chemical key which fits many doors in the castle of metabolism. Make sure it is the dungeon and not the pantry door which you lock, and if you are doubtful about the door, keep the key in the bottle in your consulting-room!"

Dr. C. A. **Clarke** thought the sulphonamides were given far too often in undiagnosed cases. It was much more difficult to decide whether a sterile pleural effusion in a young adult was tuberculous if sulphonamides had been given. He reviewed some surgical conditions in which a penicillin umbrella was used, and mentioned the attempted prevention of recrudescences of rheumatic fever by giving sulphonamides during the winter months. He then referred to the administration of sulphadiazine to 75,000 people in a Mexican town, which speedily stopped an epidemic of cerebrospinal fever. In his opinion toxic reactions were rare provided plenty of fluids were given and courses limited to about a week. The routine administration of the drugs in the tonsillitis ward was dangerous because of the risk of agranulocytosis. The main future of the sulphonamides lay in prophylaxis; in the treatment of established diseases they would slowly be replaced by penicillin and other antibiotics.

Dr. A. O. **Ross** said that in venereal diseases sulphonamides were of value in the treatment of gonorrhœa, non-specific urethritis, chancroid, lymphogranuloma inguinale, and granuloma venereum, but had no lethal effect on *S. pallida*. Sulphathiazole was the sulphonamide of choice in the treatment of gonorrhœa in doses of 6 g. daily for five days. The urine should be alkaline and there should be a copious fluid intake. Minor toxic reactions, especially in private patients, were more common than formerly, and this was probably a sensitisation caused by previous improper administration for a trivial complaint. This militated against the effectiveness of the drug in more serious illnesses. Because sulphonamides substantially reduced the infective period of gonorrhœa, fewer cases than expected, pro rata with syphilis, had occurred in the last few years. It was regrettable that sulphonamide treatment of gonorrhœa was being ousted by the more effective penicillin, since the latter masked the possible coincident infection with syphilis. In the sphere of venereal diseases, the greatest abuse of the sulphonamides had been the irrational habit of prescribing them in subtherapeutic doses to women complaining of vaginal discharge, before establishing the diagnosis by laboratory methods.

The **President** expressed the opinion that pushing any drug to the patient's extreme discomfort in the way of depression and nausea was unjustified. In erysipelas the sulphonamides often gave dramatic results.

Dr. R. W. **Brookfield** recalled the teaching of the late Prof. Hill Abram that when once the indications for a drug were well established it should be given in full dosage to produce the optimum effect rapidly. This certainly applied in the case of sulphonamides. The doctor's confidence in using a drug was considerably increased if he were well acquainted with the possible toxic effects and their relative frequencies. While the danger of agranulocytosis had been rightly stressed, its frequency appeared to have been exaggerated, since in that gathering, representing many aspects of medical practice, no-one seemed to have seen a fully developed case of severe agranulocytosis definitely attributable to sulphonamides. Little stress seemed to have been placed on dermatitis due to sensitisation. This had been a problem of some magnitude in the Far Eastern theatre and many soldiers and airmen had been invalided home because of intractable dermatitis resulting from the external application of one of the sulphonamides. So serious was the problem that it was in general forbidden to exhibit sulphonamides externally and internally in the same subject. Possibly the severe reactions seen were largely conditioned by the effects of bright sunlight, since skin reactions did not seem to be nearly as common in this country.

Dr. **Lennox Johnston** maintained that the administration of sulphathiazole to all cases of "influenza"—a provisional diagnosis attached, in general practice, to almost all varieties of infections, many of which turned out to be acute bronchitis, incipient pneumonia, &c.—was invaluable in shortening the illness and incapacity. Except in doubtful cases of gonorrhœa in the female, as Dr. Ross had pointed out, it was advisable to give 5 to 6 grammes as early as possible, and before a final diagnosis could be made.

Dr. F. **Glyn-Hughes** did not think there was much danger of general absorption when a sulphonamide was applied locally, so long as it was incorporated in a cream with a 'Tylose' or similar base. Impetigo and all streptococcal infections of the skin responded very well to such treatment and he did not hesitate to reinforce the effect by giving the drug internally at the same time. He had seen only one case of agranulocytosis and this was sufficiently rare to justify publication. He agreed that penicillin was superior to the sulphonamides in sycosis and some other staphylococcal infections, but sulphathiazole cream was an excellent remedy. He had not had a fatal case of pemphigus neonatorum since using sulphonamides, and for the same reason gonococcal ophthalmia had lost most of its terror. Dermatitis herpetiformis could be controlled by sulphonamides, and many cases of pemphigus responded, at least temporarily, when all else failed. He had always regarded lupus erythematosus as a manifestation of streptococcal infection, and had found that most recent cases responded well to sulphonamide therapy, though he agreed that search for the focus of infection was necessary; he had seen recovery in 3 acute cases of this disease when a sulphonamide was the only drug used. As a routine all cases of erythema multiforme received the drug, and there was no better treatment.

Dr. G. Y. YARDUMIAN said that in general practice sulphonamides should be used as a prophylactic in many diseases before an actual diagnosis was made, perhaps not in full doses. This would raise the morale of patients to some extent, since many of them asked for these drugs. If and when the patient was sent to hospital the amount of drug given and the duration of treatment should be stated. Sulphonamides were most beneficial in lobar pneumonia, but though the temperature came down on the second or third day this did not mean that resolution had taken place, since it may be delayed. They were also very useful in puerperal fever and erysipelas. When the patient was under sulphonamide treatment other means of helping him must not be forgotten, and plenty of fluids, warmth, and rest in bed prescribed.

Dr. G. WILLIAMSON said that sulphaguanidine had relieved anxiety in cases of bacillary dysentery in a mental hospital. All cases with clinical indications—e.g., pyrexia, diarrhœa with blood and mucus—were given a full course and within 48 hours were relieved of symptoms. Laboratory confirmation was not waited for in clinically positive cases but was obtained at the first opportunity. It was preferable to get clinical improvement rather than wait for laboratory tests before starting sulphaguanidine treatment.

Reviews of Books

1. Penicillin: its practical application

Editor: Sir ALEXANDER FLEMING, M.B., F.R.C.P., F.R.C.S., F.R.S., professor of bacteriology in the University of London at St. Mary's Hospital. London: Butterworth. Pp. 380. 30*s*.

2. Penicillin: its properties, uses and preparations

Published by direction of the Council of the Pharmaceutical Society of Great Britain. London: Pharmaceutical Press. Pp. 199. 10*s*. 6*d*.

3. Penicillin in General Practice

J. L. HAMILTON-PATERSON, M.D., pathologist to Redhill County Hospital, Edgware. London: Staples Press. Pp. 95. 5*s*.

4. Practical Points in Penicillin Treatment

G. E. BEAUMONT, D.M. Oxfd, F.R.C.P., physician to the Middlesex Hospital; K. N. V. PALMER, M.B. Camb., M.R.C.P., acting medical registrar at the hospital. London: J. and A. Churchill. Pp. 16. 1*s*. 6*d*.

WITH the exception of the handbook prepared by the medical staff of 21 Army Group and a special number of the *British Medical Bulletin* (1944; 2, no. 1), both of which had a somewhat limited circulation, no convenient and selected summary of the many original papers on penicillin therapy has been published. The removal of restrictions on the sale of penicillin to doctors gives occasion for the appearance of these four books, each of which gives sound guidance to those whose experience with penicillin is limited.

The books all give clear directions on dispensing and storage, with indications as to how much latitude can be allowed, and the one prepared for the Pharmaceutical Society points out that recent batches of penicillin are more stable than those of two years ago but that the potency of any batch is only approximate. On the clinical applications of penicillin there is little disagreement between the books. More attention than seems deserved is given by all to continuous administration; while useful in hospital practice, this is not easy elsewhere and seems to be less used than it was two years ago.

In the first book, one chapter of which has appeared in THE LANCET (1946, i, 805), Sir Alexander Fleming has called on the services of many others who have contributed to our knowledge of the subject; the account of his discovery and its development, and the chapter by Mr. Porritt and Professor Mitchell, are outstanding. Each chapter has a well-chosen list of references.

Seldom has so much information been compressed into two hundred pages as in the second book. The chemical assay of penicillin, the many methods of oral administration, and the various regulations under the Therapeutic Substances Act are all discussed in detail. The principles rather than the minutiæ of clinical application are stated clearly and the book is informatively illustrated.

The authors of the two shorter books write on the practical applications of penicillin from their own experience. Dr. Beaumont and Dr. Palmer give admirable directions for the technique of intramuscular injection.

Human Biochemistry

I. S. KLEINER, PH.D., professor of biochemistry and physiology, New York Medical College. London: H. Kimpton. Pp. 573. 30*s*.

MANY books are now being written on the clinical aspects of biochemistry, and it becomes a task to choose a novel title from "clinical biochemistry," "biochemistry in or of medicine," "clinical pathology," and "clinical diagnosis by laboratory methods." This book with its original title is more biochemical than clinical, but a chapter on clinical applications of biochemical tests is informative and useful. The remaining 28 follow the orthodox order, discussing physical chemistry, protein, fats, carbohydrates, enzymes, hormones, vitamins, urine acid-base balance, and the like.

Biology of Tissue Cells

ALBERT FISCHER, director of the Biological Institute, Carlsberg Foundation, Copenhagen. London: Cambridge University Press. Pp. 345. 31*s*. 6*d*.

THIS imaginative and stimulating book on tissue culture should appeal not only to specialists in this branch of biology but to all who are interested in the physiology of growth. As the author states in the preface, "it does not pretend to be a monograph nor a textbook, but includes a collection of experimental data on the subject, arranged in their proper relation to the main problems of biology and physiology." For this reason the work is less technical and of much greater general interest than most books on tissue culture. It deals mainly with unorganised growth in vitro—with cultures of actively migrating and dividing cells which have lost their normal histological arrangement and functional activity. Dr. Fischer regards such cultures not as colonies of independent individuals but "as primitive cell states or organism-like systems." He records much fascinating information about the biology of these systems; the laws which limit and control their growth, the structure, behaviour, and especially the interdependence of their component cells, their nutritive requirements, and their senescence and rejuvenation. Only certain aspects of organised growth in vitro are considered. Although this part of the book contains some interesting suggestions and ideas, it is inferior to the rest; for the remarkable capacity of many tissues for almost normal histological and sometimes anatomical development is not sufficiently stressed.

The translation from the Danish is adequate and the meaning usually clear, though there are some small errors of idiom and grammar. The bibliography is incomplete and sometimes inaccurate, owing, no doubt, to war-time difficulties, and a larger index would have been welcome. These, however, are trivial flaws in an important and eminently readable

Vitamins in disorders of the circulation

During the time—nearly 20 years—in which Vitamins Ltd. have been working on nutritional subjects, dramatic advances have been made in the recognition of deficiency conditions and diseases, and in the appropriate uses of vitamin therapy.

In disorders of the circulation the effect of B_1, preferably with other factors of the B Complex, on certain heart conditions is well known. A combination of vitamins and minerals greatly helps the assimilation of iron in deficiency anaemias. The value of vitamin K in promoting prothrombin formation is perhaps not generally appreciated.

Condition	Indications	Therapeutic Agents
1. CARDIAC CONDITIONS. **(a) Beri-beri heart.** **(b) Congestive failure with oedema associated with mild degrees of vitamin B_1 deficiency.**	Vitamin B_1 is needed for both these conditions possibly in high doses.	**VITAMIN B_1 (Aneurin hydrochloride) Vitamins Ltd.** Ampoules : 10, 50 or more mg. daily. Tablets : 3 mg. twice or thrice daily. **BEFORTISS B Complex Capsules, Vitamins Ltd., or** **BEMAX** to supply the other factors of the B complex.
2. CIRCULATORY DISORDERS without congestive failure, e.g., Varicose veins.	Vitamin B_1 in high doses has been found to relieve pain.	**VITAMIN B_1 (Aneurin hydrochloride), Vitamins Ltd.** By injection or by mouth. 10 mg. or more daily.
3. BLOOD DISEASES. **(a) Anaemias.**	Iron deficiency anaemias are frequently complicated by vitamin deficiencies.	**COMPLEVITE** Tablets of 2 colours to be taken in equal numbers. One of each colour thrice daily provides : Vitamin A - 4,000 i.u. Vitamin B_1 - 0.60 mg. Vitamin C - 20.0 mg. Vitamin D - 300 i.u. Calcium - 160 mg. Iron - 68 mg. Iodine, Manganese, Copper } not less than 10 parts per million *at time of manufacture*
	The macrocytic anaemias such as Addisonian pernicious anaemia and sprue have been found in preliminary trials to respond to folic acid.	It is hoped that folic acid will soon be available in this country for therapeutic trial.
(b) Hypoprothrombinaemia. **Haemorrhagic disease of the new-born.**	The prothrombin is normally low for the first few days of life.	**VITAMIN K, Vitamins, Ltd.** One tablet (10 mg.) daily to the mother during the last month of pregnancy or every 6 hours if seen first in labour, or 5 mg. by injection to the infant.
OTHER CONDITIONS **Hepatic diseases obstructive jaundice.**	Low prothrombin is here associated with defective absorption of vitamin K from the absence of bile salts in the intestine.	**VITAMIN K, Vitamins Ltd.** One tablet daily with bile salts.
Ulcerative Colitis.	Where fat absorption is defective.	**VITAMIN K, Vitamins Ltd.** One tablet daily

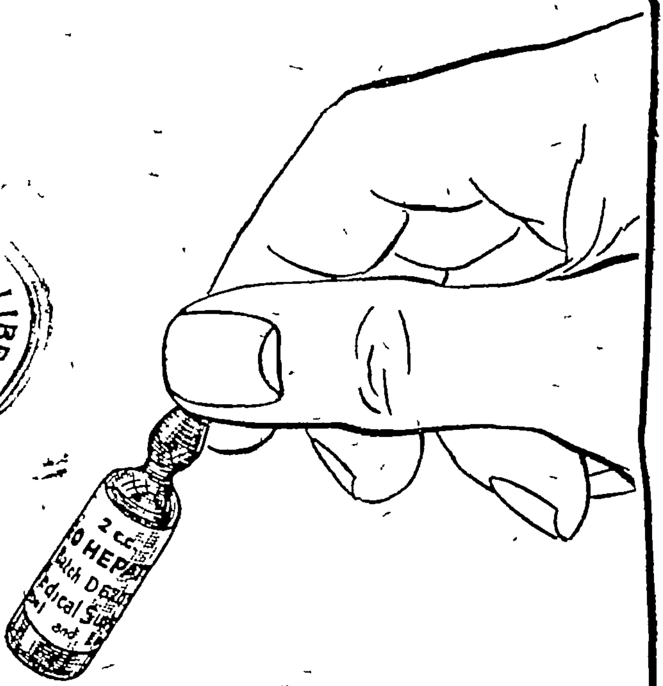
Further particulars of the various vitamin products are obtainable on request from :

VITAMINS LIMITED

(Dept. L.X.H.1), Upper Mall, London, W.6

EVANS

SAWAI MAN SINGH MEDICAL COLLEGE LIBRARY
Accn. No......
Date...............
Price........
JAIPUR.



PROTEOLYSIS

has made available
a new high potency

NEO-HEPATEX

A Liver Extract for injection which requires only one dose of 2 c.c. in 14 days to restore the blood picture and usually not more than 2 c.c. monthly for maintenance purposes.

Issued in ampoules of 2 c.c. and in bottles of 10 c.c. and 25 c.c.

Literature gladly sent on application

Made in England by

Evans Medical Supplies Ltd

Speke
LIVERPOOL 19

Bartholomew Close
LONDON EC1

THE LANCET

LONDON: SATURDAY, NOV. 9, 1946

Precedents

THE object of administration is to create conditions in which work can be done smoothly and well. That is indeed the main reason for forming the National Health Service. Like the autonomic nervous system of the human body, such a service should perform its administrative functions unobtrusively and without obstructing in any way the activities it exists to subserve. It is a means, not an end; and it will be a failure unless it proves itself a better means than those already used with partial success. The Government are rightly trying to improve on the empirical and haphazard organisation of the past; but the price paid for rationalisation would be too high if it led to the medical work of this country being run on bureaucratic lines. Mr. BEVAN has delivered the hospital service from the hands of local authorities, and there are grounds for hoping that the Ministry of Health, making more use of professional advisers, will try to avoid a stultifying control.[1] A special effort will, however, be needed to prevent the installation of bureaucratic machinery round the regional boards by which the hospital services are soon to be administered.

The task of each of these boards will be very big. In an address lately given as president of the Hospital Officers' Club, Mr. C. M. POWER has calculated that, if there are 20 regions, each board, serving an average of 2 million people, will have 125 hospitals (not counting mental institutions) with 30,000 beds and a staff of 15,000, and will dispose of some £6 million a year. To cope with these duties it will require, he thinks, at least five committees—finance; staffing; planning; supplies and equipment; building and establishment—and also a number of subcommittees dealing separately with such subjects as tuberculosis and nursing. It is obvious that, if the members of the board and its committees (who will be unpaid) meet only occasionally, much responsibility will rest on its officers; and unless the right arrangements are made from the start, there is grave risk of these officers developing a bureaucratic outlook and procedure which would offset the benefits obtainable from planning the regional service as a whole

In an article[2] which deserves further attention, a correspondent has pointed out that there are two possible lines of development—two conceptions now competing for supremacy:

> "On the one hand, we have the comparatively simple 'service' conception of the regional organisation, with departmental officers and staff, each possessing their defined sphere of responsibility, directing and inspecting the various departments of hospital activity. Thus, to take one or two examples at random, we should have a regional nursing officer responsible for the standard of nursing throughout the hospitals, without whose assent a matron would be foolish to venture upon any innovations in nursing technique or organisation. We should have a regional financial officer, without whose blessing no hospital committee would care to incur expense for which there was no precedent. We should have, too, a regional architect, to whom projects would stand referred for translation into plans and estimates."

While admitting the many advantages of such a scheme our correspondent felt that it would raise the status of the regional officer at the expense of the people managing the hospitals, who will never pull their weight unless they have scope both for initiative and, in moderation, for mistakes. "If these people begin to feel that wisdom lies not in making their own decisions but in ensuring that their activities will commend themselves to the regional officers heaven help us." The alternative which he proposed would reproduce a striking feature of the sector organisation of the E.M.S., where authority was vested in professional personnel—medical, nursing, and administrative—who themselves already occupied posts of responsibility at the principal hospitals concerned: he would make it a rule that "no-one shall be appointed to a post carrying regional authority who does not already and concurrently hold a 'key' position in his or her respective sphere." This, however, is not enough by itself; and his complementary suggestion is that the regions should adopt the practice of King Edward's Hospital Fund whereby, on major issues, accredited representatives of the hospitals always have an opportunity to meet the appropriate subcommittee of the fund. He recommends the principle that "whenever questions of policy arise on which opinions may differ, decisions shall be reached, not by an official applying to the papers on his desk criteria of some central policy, but always in discussion across the table with those responsible for the execution of the project." The Nuffield Provincial Hospitals Trust makes use of the same excellent method.

There remains the problem of the constitution of the boards and the way in which professional opinion can best be presented to them. Elsewhere in this issue the same correspondent, quoting the experience of voluntary hospitals, argues that the views of the profession will be most helpful to the board if they come in the form of considered recommendations from an advisory committee. He believes that the presence of too many doctors on the board itself—speaking perhaps discordantly—might actually weaken the professional voice in its counsels, which could or should be expressed most strongly by a medical advisory committee through its chairman and secretary Moreover, if the board itself, losing sight of its proper functions, were to assume those of a medical advisory committee, its essential decisions would probably be taken by an inner ring. These decisions are ultimately financial. What the board has to do is not to treat patients but to create conditions in which others can do so: much of its time will be taken up with non-medical matters such as the employment of lay staff, the purchase of equipment and stores, and the distribution of money; and there is substance in Mr. POWER's plea that—whether he is a doctor or a layman—the primary qualification of its chief executive officer, or secretary, should be that he is an experienced hospital administrator. On the other hand, since the board's labours are useless except in so far as they promote the recovery of patients, it must at all times have the aid of a medical committee well qualified to speak on the needs of the service, on the assignment of tasks, and on the relative value of possible developments, as well as on the recruitment, appointment, and working conditions of medical staff. The secretary of this committee must of course be a doctor, but our correspondent would give him a seat on the board rather than make him the senior medical member of its secretariat. While it is evident that the board must have a paid staff, we can imagine nothing more harmful than a hierarchical system in which the doctors and nurses in the hospitals came to regard a regional official as their professional chief.

---

[1] See *Lancet*, Oct. 19, p. 567.
[2] *Ibid*, July 27, p. 137.

The voluntary hospitals, in eschewing hierarchy, have produced some remarkably sound precedents, and we trust that Mr. BEVAN's promise to "decant the best experience of the voluntary hospital administration into the future hospital service" will apply to principles as well as to persons.

Progress with Folic Acid

IT is now clear that folic acid will take its place among the vitamins. Like other vitamins, it has many natural sources and exists in several, probably closely related, forms. The name was originally given to an almost pure chemical substance isolated from spinach[1]; it is found in many other green leaves, including grass, and in mushrooms, liver, and yeast. The folic-acid compounds have been studied during the last decade under several names, for the following are now known to be folic-acid variants—vitamin M, deficiency of which causes a pellagrous syndrome of anæmia, leucopenia, diarrhœa, and mouth lesions in monkeys; vitamin B_c, deficiency of which causes a nutritional anæmia in chicks; vitamins B_{10} and B_{11}, responsible for growth and feather development in chicks; and the "eluate factor" (from liver) and the "*L. casei* factor," both essential for the growth of *Lactobacillus casei* and *Streptococcus fæcalis* R. It is the *L. casei* factor from liver that has been synthesised and whose constitutional formula has been established; the name "pteroyl glutamic acid" has been suggested for this folic acid, which will, so far as is known, produce all the effects of the other forms. The *L. casei* factor from yeast differs only in the number of glutamic-acid molecules; the relations of the other factors have not yet been worked out.

With its wide distribution, folic acid must be present in any mixed diet, and no instance of natural folic-acid deficiency in man has been described, though deficiencies have been artificially brought about by giving specially purified diets. Rats, and probably other mammals, are not dependent on food intake for their supplies of folic acid, since, as with vitamin K, they can synthesise it in their intestine. The addition to the diet of a sterilising sulphonamide-like sulphasuxidine prevents such synthesis, and this was how NELSON and ELVEHJEM[2] produced the folic-acid deficiency syndrome in rats—granulocytopenia and lack of growth—and corrected it by giving folic-acid concentrates. Leucopenia, especially lack of polymorphonuclears, is the outstanding hæmatological effect of artificial folic-acid deficiency in monkeys and rats, and when folic acid was first given to patients with nutritional anæmia it was with the idea of correcting the leucopenia. This it does; but the effects on the anæmia were equally startling and have now overshadowed the leucopoietic properties.

The place of folic acid in the treatment of human disease is beginning to take shape. It is of no value in iron-deficiency anæmia, in anæmias characterised by hypoplasia or aplasia of the bone-marrow, in leukæmias, and in a still indefinite group of other anæmic conditions that yet respond to liver extracts. Folic acid is a powerful therapeutic agent in addisonian pernicious anæmia, nutritional macrocytic anæmia, sprue, and the macrocytic anæmia accompanying pellagra; success has also been reported in cœliac disease.[3] The results are variable in refractory megaloblastic anæmia, including non-tropical sprue, and in anæmia secondary to cirrhosis of the liver, but it is worth a trial in these cases. There is no convincing evidence that it has any effect in idiopathic agranulocytosis, or in the agranulocytosis or neutropenia secondary to dosage with drugs like the sulphonamides or thiouracil; in nutritional anæmia a leucopoiesis occurs as part of the general hæmopoietic recovery. Finally, there is the report of CARRUTHERS[4] from India that in patients with chronic diarrhœa (not dysenteric) and microcytic anæmia folic acid will relieve the diarrhœa without affecting the anæmia; and SPIES has noted that in sprue the radiological pattern of the bowel returns to normal and the excessive irritability disappears when folic acid is given.

The dosage of synthetic folic acid is being rapidly worked out. It can be given by mouth or parenterally dissolved in disodium phosphate. For pernicious anæmia the oral route is adequate; 20 mg. is given daily in the relapse phase and this dose is maintained until remission is well established, when it is reduced to 10 mg. daily or less. DOAN,[5] and DAVIDSON and GIRDWOOD,[6] report suboptimal results with doses of 2–10 mg. daily. For maintenance, DOAN reports that the dose needed varies from 40 mg. a week to 20 mg every third week; with this régime minor neurological signs improve and no case has so far developed signs of involvement of the spinal cord tracts. Good results have been reported with single large doses of 150 mg. parenterally or 400 mg. by mouth; these produce a rapid reticulocytosis but are probably unnecessarily large. In nutritional anæmias, 20 mg. daily seems adequate, and the same dose is effective in sprue; the parenteral route has some advantage in the early part of the illness. The general conclusion is that 20 mg. is an effective daily dose for these anæmias and larger doses should not be given; folic acid is not easy to prepare and supplies are unlikely to be plentiful for some time. In the refractory types larger doses are in order, but there is little information yet; according to DOAN the maximal permissible intravenous dose is 150 mg., since larger doses may cause histamine-like vasomotor disturbances. Doses up to 400 mg. have been given by mouth without distress.

A comprehensive review of the development of knowledge about folic acid has been published by BERRY and SPIES,[7] and another appears in the UNRRA *Bulletin.*[8] The latter remarks that folic acid

---

1. Mitchell, M. K., Snell, E. E., Williams, R. J. *J. Amer. chem. Soc.* 1941, 63, 2284.
2. Nelson, E., Elvehjem, C. A. *J. biol. Chem.* 1942, 145, 173.
3. Brody, H. P., Gore, L. *Lancet*, Oct. 26, p. 618. Dalton, H. W., Thomson, M. L., Wilson, V. K. *Ibid*, Nov. 2, p. 652.
4. Carruthers, L. B. *Ibid*, 1946, i, 849.
5. Doan, C. A. *Amer. J. med. Sci.* 1946, 212, 257.
6. Davidson, L. S. P., Girdwood, R. H. *Lancet*, Sept. 14, p. 373.
7. Berry, L. J., Spies, T. D. *Blood*, 1946, 1, 271.
8. UNRRA Health Division, European Regional Office. *Bull. commun. Dis. med. Notes*, 1946, 5,

is valuable "in the treatment of anæmia, particularly macrocytic anæmia, irrespective of the clinical classification." But this is scarcely true: if anæmias are classified on a basis of clinical signs plus the type of morbid erythropoiesis, on a scheme like that put forward by ISRAËLS[9] in 1941, then it is clear that all anæmias that have so far been shown to respond to folic acid fall into ISRAËLS's "type 1," in which there is failure of maturation of pro-erythroblasts and deviation to megaloblastic erythropoiesis, anæmias in the other types do not respond. The evidence so far suggests that a response from folic acid can only be expected in patients whose sternal bone-marrow reveals definite megaloblastic change, and classification on these lines has, in fact, been followed by all clinical workers with folic acid. In nutritional anæmias this classification is particularly necessary, since non-megaloblastic macrocytic anæmias are common, and there is no evidence that they respond to folic acid.

Folic acid is still regarded as an enzyme or co-enzyme in the system that produces the liver principle. DAVIS[10] has shown that folic acid will increase the serum cholinesterase and will restore the blood-count of dogs rendered anæmic by feeding with choline chloride; the application of this information is not very clear, and there is no reason to suppose that the choline anæmia of dogs is in any way related to human megaloblastic anæmias.

The clinical research on folic acid has been of a high standard: cases have been carefully selected, proper criteria decided on beforehand,[11] and multiple therapy avoided; all of which makes for progress and firm assessment of results. The advent of such a potent hæmatinic agent as this makes it ever more necessary to observe the maxim: "Diagnosis before treatment."

Oiled Bed-linen

DUST in coalmines and in cotton-mills has long been recognised as a cause of chronic respiratory diseases on which may be superimposed such bacterial infections as bronchitis, pneumonia, and tuberculosis. But dust in the home, in the office, and particularly in the hospital ward may also be a carrier of disease. Many respiratory pathogens—hæmolytic streptococci, diphtheria bacilli, pneumococci, probably tubercle bacilli, the viruses of smallpox and psittacosis, and certain rickettsiæ—have considerable viability outside the body and may be recovered from the clothing and bed-linen of affected patients and from the floor dust in the environment of human or animal carriers. Until recently the clinician was so imbued with the Flügge doctrine of the spread of respiratory infection directly by droplets that he was unwilling to believe in a more indirect spread by bacteria-laden dust. Indeed the evidence in favour of dust-borne infection is still largely circumstantial, although numerous clinical records have incriminated infected dust as the source of streptococcal sore throats, "Q" fever, and psittacosis.

The part played by a particular agent in the spread of infection can be assessed by eliminating the agent from one group of mice or men at risk while allowing it to persist in a control group. Dust in mines has been partially controlled by wet drilling and spraying Its control in the home or in the hospital ward is an entirely different problem. During the late war this problem was ardently and ably tackled by VAN DEN ENDE and his colleagues who showed that floor dust can be trapped by treating wooden or linoleum floors with spindle oil—a crude petroleum oil which, when sparingly applied to the unwaxed surface at intervals of 4–8 weeks, reduced by 80–90% the bacterial content of the air during sweeping or other activities. Later they devised a method for oiling sheets and blankets with an oil-in-water emulsion which retained over 90% of the bacteria-carrying particles ordinarily released during bed-making. At this stage the coöperation of the British Launderers Research Association was enlisted and resulted in an improved technique for oiling bed-linen on a large scale in hospital laundries.[1] The principle of the method is that oil drops are positively or negatively charged by the addition of cationic or anionic wetting agents which fix any desired amount of oil in the woollen or cotton fabrics This method, used by WRIGHT and her colleagues[2] in a measles ward where streptococcal cross-infection was rife, caused a remarkable reduction in both latent and clinical infection contrasted with an untreated ward: in the control ward there was 73% streptococcal cross-infection and 14·3% acute otitis media, while in the treated ward the corresponding figures were 18·6% and 2·8%.

The scene shifts to America ROBERTSON and his associates,[3] impressed by the part which infected dust apparently played in the spread of infection in army barracks and hospitals, began in 1943 to study the problem of dust control along lines similar to those followed by the English workers. First they confirmed that certain bactericidal substances and water-soluble wetting agents when applied to blankets had no bactericidal or adsorptive action on infected dust. Next, using a purified mineral oil ('Fractol A') as base, they found two substances which were particularly effective as wetting and fixative agents. The first of these, triethanolamine oleate, was finally discarded after field trials, because the oil tended to separate on standing, while the oil content of treated blankets was uneven, varying from 1% to over 5%, at which level there is a considerable fire hazard. The other emulsifying agent 'Triton E,' a substituted phenyl ether of polyethelene glycol, gave in a proportion of 13 parts to 87 parts of the oil a stable paste which, being non-ionic, was not neutralised by mixture with soaps or acids and was not affected by variations in the pH or hardness of the water. This oil emulsion, added to the last water rinse in the washing machine, is equally effective for the oiling of woollen and cotton goods, is cheap and easy to apply, and is non-irritating to the skin; in fact the whole procedure seems to be remarkably free of pitfalls. The fact that oiled blankets retain their dust-holding property after a number of washings suggests that the oiling of new blankets by the manufacturer might become a routine. The 2–4% of oil in the blanket cannot be detected by touch, and tests have shown that oiled blankets are likely to be warmer than unoiled blankets and

---

9. Israëls, M. C. G. *Lancet*, 1941, ii, 207.
10. Davis, J. E. *Science*, 1946, 104, 37.
11. Wilkinson, J. F., Israëls, M. C. G., Fletcher, F. *Lancet*, August 3, p. 156.

1. Harwood, C. F., Powney, J., Edwards, C. W. *Brit. med. J.* 1944, i, 615.
2. Wright, J., Cruickshank, R., Gunn, W. *Ibid*, p. 611.
3. Puck, T. T., Robertson, O. H., Wise, H., Loosli, C. G., Lemon, H. M. *Amer. J. Hyg.* 1946, 43, 91. Loosli, C. G., Wise, H., Lemon, H. M., Puck, T. T., Robertson, O. H. *Ibid*, p. 105.

to last at least as long. Extension of the oiling to surgical dressings, wearing apparel, and other fabrics may follow.

Although the American workers have confirmed the value of oiled bed-linen for the control of streptococcal infection in hospitals,[4] they have been disappointed with the procedure for the control in barracks of non-bacterial "catarrhal fever," which occurred regularly as a winter epidemic among recruits.[5] The most likely explanation of this failure is that these non-specific upper respiratory infections are transmitted by direct contact or by droplet nuclei rather than by contaminated dust. There is good epidemiological evidence that certain virus infections, such as measles and chickenpox, are spread by droplet nuclei; and in the case of catarrhal fever the Americans found that double-bunking in barracks, which reduced considerably the opportunities for direct-contact transmission, also reduced by a half the epidemic incidence of the disease. Even with streptococcal infections, where the existence of secondary reservoirs in dust is well established, little is known of the relative importance of dust compared with droplets and droplet nuclei in the spread of the disease. However, the evidence incriminating dust in the spread of bacterial infections has been steadily accumulating, and it seems that the oiling of bed-linen by hospitals for children and for tuberculosis and other infectious diseases is both hygienic and practicable.

Annotations

PATIENCE REWARDED

THE appearance within a few weeks of four books designed to give guidance in the uses and hazards of penicillin is the epilogue of perhaps the most interesting drama of modern therapeutics. From now on neither pharmacist nor physician has any excuse for misusing penicillin. Supplies are ample; the price is moderate; the potentialities that we know are unlikely to be extended greatly, though there will still be advances—for example, in methods of prolonging the effect of a single dose and in oral administration.

In retrospect we can now consider whether this drama has been played well or ill. The preface to the monograph on penicillin published under the ægis of the British Pharmaceutical Society (reviewed elsewhere in this issue) suggests that harm has resulted from the conditions of secrecy and scarcity under which the earlier scenes were acted. It is a point worth consideration, since every day so many in so many laboratories seek out therapeutic agents as yet unknown to us. What made the early history of penicillin so different from that of many other drugs? Conceived—if Sir Alexander Fleming will forgive us—in obscurity, it was a weakly child saved only by parental devotion until its godfathers in Oxford gave it strong limbs and higher potencies. Transatlantic migration gave it fecundity (and, we must add, a split personality, since there is no longer one penicillin but many penicillins). Meanwhile it had won its spurs in the Radcliffe Infirmary and for three years slew innumerable staphylococci (and other pagans) from the Solomon Islands to Seattle. No hero of Christendom ever served such an apprenticeship of arms before he was released from tutelage. His powers were measured, his feats catalogued, and his misdeeds, few though they were, corrected. He has now stepped into the world, a force for good at the service of those who require his aid.

Would as much benefit have been gained had penicillin been released for general use in, say, 1942? The question is admittedly an idle one, since peace and deep culture were both necessary before this drug could be available in quantities sufficient for all. Other drugs have been subject to intense therapeutic trial before they have been released on the open market. Manufacturers have coöperated nobly, and the medical world hears of the successes and not of those which have been consigned to the dustbin without demur when they have been shown to be either valueless or dangerous. Other drugs have resulted from coöperative endeavour where thoughts of pecuniary reward have been of secondary importance or less than that. But if we may judge from the history of the sulphonamides and their successors, penicillin has been the gainer from its slower development. Endocrinology likewise provides object lessons of the dangers of uncontrolled trial of therapeutic agents whose possible effects are scarcely known. Penicillin, it is true, seems to have few evil habits, but it is hard to believe that its history would have been such a continuous story of success if it had been thrown early on the world and lacked the arduous and painstaking nurture that it received from so many disinterested minds in this country and America.

Some of us remember with equal pride and shame a meeting of the section of pathology of the Royal Society of Medicine at St. Mary's Hospital in the early thirties when Dr. Fleming showed some pictures coloured with chromogenic bacteria and a plate on which some staphylococci had been inhibited by a mould. After all, we too got our plates contaminated and we did not boast about it. We were very young.

PURIFICATION OF TETANUS TOXIN

THE preparation of the convulsive constituent of tetanus toxin in crystalline form, as reported[1] from Western Reserve University, U.S.A., is a step of outstanding importance towards the interpretation of the action of tetanus toxin used in the form of crude filtrates. The crystalline toxin is protein in character without a carbohydrate constituent and is apparently free from thiol groups. It has about 50,000,000 lethal doses for mouse, and about 3500–4000 flocculating units, for each mg. of nitrogen, the degree of purity being nearly 600 times that of the parent toxic filtrate. The basis of the method of preparation is precipitation at accurately controlled hydrogen-ion and salt concentration by methyl alcohol at temperatures of $-4°$ to $-5°$ C. The crystals tend to disintegrate at temperatures above $-4°$ C, creating considerable difficulties in handling the material. So far no electrophoretic sedimentation or solubility analyses have been published, but the fact that three recrystallisations gave no significant change in the flocculation value suggests that the material is a single protein.

Tetanus toxin has perhaps been the most troublesome of all toxins that the immunologist has to deal with. It has been known for some time that filtrates differ qualitatively in their properties,[2] as determined, for example, by the ratio of lethal doses in different animals, though the antitoxins produced by the injection of different filtrates are apparently identical.[3] The isolation of a pure crystalline toxin from such filtrates may well throw light on these and other, probably related, difficulties which have arisen in the titration of tetanus antitoxin; for in the crude filtrates it is possible that

---

4. Loosli, C. G., Robertson, O. H. *Amer. J. med. Sci.* 1946, 209, 166.
5. Commission on Acute Respiratory Diseases and Commission on Air-borne Infections. *Amer. J. Hyg.* 1946, 43, 120.

1. Pillemer, L., Wittler, R., *Grossberg*, D. B. *Science*, 1946, 103, 615.
2. Glenny, A. T., Barr, M., Ross, H. E., Stevens, M. F. *J. Path. Bact.* 1932, 35, 495.
3. Smith, M. L. *Bull. Hu*

other substances modify the course of the reaction between toxin and antitoxin and between toxin and tissue cell. The obscure problem of what happens when toxoiding occurs will also be brought definitely nearer solution now that the reaction can be followed on the single chemical substance instead of the mixture of substances present in the filtrate. It is to be hoped that this method will be successfully applied to other toxins, particularly to diphtheria toxin.

It is curious that the method of precipitation of protein with alcohol in the cold, first used some forty years ago by Mellanby[4] and now becoming of increasing importance, should have been neglected for so many years. The probable reason of its neglect was that the proper application of the method needed rigid temperature control at low temperature, and it was not till the war and American chemical engineering combined to provide facilities that Cohn, working on the fractionation of human plasma, was able to work out the conditions for successful large-scale handling of such processes.

CHILD HEALTH

> "Primary responsibility for the health of their children must continue to rest with parents and they should regard members of the health services as agents helping them to carry out their duties and not as authorities taking the responsibilities off their shoulders."

THE pædiatric committee of the Royal College of Physicians put this disclaimer on the first page of their final report,[1] but it does not prevent them considering responsibly and fully the duties of doctors to children. The principal means of promoting child health and welfare, they consider, are good food and good home and social conditions for both the child and the pregnant woman; proper training of doctors and nurses in the hygiene and feeding of children; education of parents and children in health; and the provision of good medical treatment services. The long-term policy, they hold, should be to make the general practitioner primarily responsible for the care of the child, in both prevention and cure of disease, since he is best fitted to give this service in the home. If his skill is to be adequate, pædiatrics should be a major clinical subject in his training, as recommended in this committee's interim report.[2] Where a health centre is established, one or more of the doctors on the staff should be specially interested in and trained in child health. Until enough well-trained doctors are available, those undertaking child-welfare work should have postgraduate training in the basic principles of public health, such as is contained in the course for the new certificate in public health, as well as postgraduate experience in the prevention and treatment of illness in children. Not only general practitioners but hospital pædiatric physicians should give some part of their time to preventive work, attending clinics, nurseries, and schools for the purpose; and, conversely, doctors employed whole-time by local authorities to do preventive work should be attached to a hospital and should spend, say, a fifth of their time in curative work. This general linkage of clinical and preventive work can be achieved, the committee think, if interchanges of staff are arranged between children's hospitals and departments and the local-authority health services, which will ultimately be staffed by general practitioners. In the meantime, since hospital pædiatricians are scarce, it may be possible to give special hospital training in pædiatrics to a proportion of full-time assistant medical officers of health, returning them to their areas to do both curative and preventive work.

In future it seems likely that all school health work will be carried out by one of these three types of doctor, which means that school clinics will become closely associated with children's hospitals, as they should. Child health visitors, able to nurse the sick child and teach child health, should do nursing and preventive work in clinics and schools.

They consider that hospitals need rebuilding and regrouping, and that both equipment and staff—nurses as well as doctors—could be improved. At present most hospital beds for children are not under the care of trained pædiatricians, and only about 40% of the sisters in charge of such beds have been trained for the State qualification in children's nursing. Since acutely ill children stand transport badly, they should have beds in their own district, while beds for long-term cases should be in hospitals outside the town, though within range of visiting parents. Eye, skin, rheumatic, and orthopædic conditions, the committee think, should be treated in special units housed in pavilions in the grounds of long-term hospitals; and general children's hospitals should have wards for infectious diseases, while fever hospitals should have general wards.

Much thought has been given to university teaching. The committee suggest that, in addition to the university departments of child health now developing, special departments closely connected with the universities might be established in non-university centres, each of which would guide pædiatric work in its own region.

Finally, to achieve integration of all child-health services, they suggest that a joint committee should be set up in each region, consisting of members of the university department of child health, and the regional and local-authority officers engaged in child-health work. This body would advise on all matters to do with child health, and would link the hospital service of the region with the services provided in each major local-authority area. They suggest, too, that under the National Health Service there should be a standing subcommittee on child health of the Central Health Services Council. The Royal College of Physicians, it is strongly recommended, should also have a standing committee on pædiatrics capable of advising on all such matters.

WORLD HARVEST

WITH the gathering of this year's harvest in the Northern Hemisphere we can see roughly how much grain the world has in hand for the coming year. China seems to be better placed than was expected, though there may be large areas of scarcity; but in India and parts of Malaya the situation is likely to remain fairly critical, and even allowing for local shipments of rice the deficit countries of the Far East will still need to import nearly 10 million tons. Russia may have a million or so tons of surplus grain for export to countries within her zone of influence. The deficiency in Europe is estimated at 12 or more million tons; England will have to import 4–5 million; and an additional 2 million will probably be needed for various other regions, including South Africa and some of the poorer South American countries. The total needs of the grain-deficit areas in the coming year will thus amount to almost 28 million tons. But though the North American harvest has been good, the exportable surplus from Canada, the United States, Argentine, and Australia is unlikely to exceed 22–23 million tons, and may be less.

These figures are given in the October issue of the *Nutrition Bulletin*,[1] which emphasises the necessity of

---

[4] Mellanby, J. *Proc. Roy. Soc.* B, 1908, 80, 399. Hardy, W. B., Gardiner, S. *J. Physiol.* 1910, 40, lxviii.

[1] Royal College of Physicians of London: Final Report of Pædiatric Committee. October, 1946. The committee are: Lord MORAN (chairman), Sir LEONARD PARSONS, Prof. F. S. LANGMEAD, Mr. EARDLEY HOLLAND, Dr. DONALD PATERSON, Sir WILSON JAMESON, Prof. J. C. SPENCE, Prof. N. B. CAPON, Dr. HELEN MACKAY, Prof. ALAN MONCRIEFF, Dr. J. A. CHARLES, Dr. R. C. LIGHTWOOD, Prof. AUBREY LEWIS, Dr. R. E. SMITH, Sir ALLEN DALEY, Prof. R. V. CHRISTIE, Prof. CHARLES MCNEIL, Dr. DOROTHY TAYLOR, and Dr. JEAN MACKINTOSH.

See *Lancet*, 1945, i, 605.

[1] Issued by the Children's Nutrition Council, 6, East Common, Harpenden, Herts. 5s. per annum.

(1) preventing needy communities from eating their new supplies too rapidly; (2) preventing a bottleneck in transport if shipping passes altogether out of Government control; and (3) diverting coarse grains from the feeding of livestock in the New World to human consumption in the Old World. With the operations of UNRRA coming to an end, there is no international body empowered to purchase large stocks of foodstuffs; the International Emergency Food Council, established last May, can only assess the situation from time to time and submit recommendations, and the major countries will naturally tend to pursue the policies that seem best suited to their own interests. UNRRA will be missed because it protected the poorer liberated countries by preventing their wealthier neighbours from acquiring excessive supplies on the world market; and the richer countries seem likely to derive additional advantage from last week's decision of the American Department of Agriculture to abandon the bulk purchase of food for export.

The purpose of the World Food Board, advocated by Sir John Boyd Orr at the September meeting of the Food and Agriculture Organisation in Copenhagen, would be to make overseas farmers aim at a record harvest by guaranteeing the purchase of any surplus at a fixed price. This plan was rejected at last week's Washington meeting by the United States representative, who suggested, no doubt with the International Trade Organisation in mind, that importing and exporting countries can better solve their problems through multilateral agreements covering specific commodities. The American rejection has caused disappointment in this country, some holding that there is now little chance of whole-hearted American participation in an international attempt to fight the world food shortage; but Sir John Boyd Orr himself has since made it clear that his plan was simply put forward for discussion, and that the agency he has in mind would be composed of representatives not only of the F.A.O. but of the International Bank and other bodies. He insists that his suggestions are complementary to the aims of the International Trade Organisation, and he is confident that a satisfactory scheme will be evolved.

DERMATOLOGY

THE views expressed early this year[1] by the Royal College of Physicians committee on dermatology[2] are carried further in a final report presented to the college last week. The concluding recommendations chiefly concern the training of undergraduates, the selection and training of future consultants and specialists, and refresher courses for medical practitioners.

Skin diseases account for some 6% of the work of general practice, and in industry occupational dermatitis wastes more time than any other form of industrial disease. Teaching of the undergraduate should therefore be such as will enable him, after qualification, to increase his knowledge and to correlate cutaneous signs with *constitutional* disorders. To meet the Goodenough Committee's wish[3] that medical training should be a smooth and logical development, the committee recommend that in the preliminary year of study he should acquire some knowledge of the common animal and vegetable parasites which attack man, and that, when studying physiology, his attention should be drawn to the importance of the physiological actions and reactions of the skin in the maintenance of health. Dermatological cases should be demonstrated to students during the introductory course in which they first approach clinical work, and systematic teaching in dermatology should be incorporated in the general course of medical teaching before the student becomes a clerk in the skin department. As a clerk in that department, he should attend at least twice a week for three months, and should study inpatients as well as outpatients. To this end, and in view of the importance of dermatology in the health service of the country, 5% of the total beds in any teaching centre should be allotted to skin disorders; or, if this is impracticable, the beds should be provided in an associated hospital. Also the committee want teaching hospitals to have dressing-centres where the patients would attend for regular treatment. This would save much of the waste of drugs through faulty application at home; it would enhance the therapeutic efficiency of the departments; and if (as is proposed) each student worked there as dresser, the centres would provide valuable experience.

About 50 men are now in training as registrars or assistants in the dermatological departments of teaching hospitals, and it is suggested that clinical and laboratory facilities for basic training should in future be provided for 15–25 each year. As formerly many dermatologists had to supplement their basic training at institutions abroad, the recent proposal for the formation of a dermatological institute in London is welcomed by the committee, who emphasise however that the ancillary departments and staffing of such an institute must be of the highest order, and that in order to give equal opportunity to all suitable candidates there will have to be financial support for graduates in training. A would-be consultant in dermatology should, they think, obtain a diploma or degree comparable to the M.R.C.P. Lond. and should have a university degree, and he should have studied for five years after medical registration. During these five years he should first hold a resident or non-resident appointment in the department of general medicine for a year; then he should spend a further year in the pathological and bacteriological departments; and thereafter he should work as an assistant or registrar in the dermatological department of a teaching hospital, and should also study ancillary subjects, such as venereology, actinotherapy, radiotherapy, zymotic diseases, and industrial medicine. After this a period of research and study abroad is desirable. It is hoped that eventually all skin departments in hospitals—even in the smaller non-teaching hospitals—will be staffed by fully trained dermatologists. Meanwhile it will of course be necessary to employ many whose training has been less comprehensive, and the vacancies could be filled by graduates who have been practising dermatology for a reasonable time and who hold or have held hospital appointments in dermatological departments. Experience as a dermatological specialist in one of the Services will of course be a strong recommendation. For general *practitioners* it is suggested that courses should be offered by the institutions providing this type of postgraduate study—e.g., municipal hospitals and non-university centres. Oddly enough, no stipulation is made that these courses should be supervised by consultants or senior specialists; yet obviously the instruction of practitioners should be impeccable.

Finally, it is proposed that the Royal College of Physicians should set up a Dermatological Board, including representatives of the British Association of Dermatology and Syphilology and the professorial staffs of the dermatological units. The duties of this board would include the recognition of hospitals at which postgraduate training in dermatology could be undertaken, and decisions concerning the suitability of candidates for appointment to hospital staffs. But, for the present at any rate, it is not recommended that either the college or the board should create a diploma in dermatology.

---

[1] *Lancet*, 1946, i, 205.

[2] The members are Lord MORAN, P.R.C.P. (chairman), Dr. HENRY MACCORMAC (vice-chairman), Sir ARCHIBALD GRAY, Dr. H. W. BARBER, Dr. A. C. ROXBURGH, Dr. P. B. MUMFORD, Dr. G. B. DOWLING, Dr. M. SYDNEY THOMSON, Dr. R. T. BRAIN, Dr. J. T. INGRAM, Dr. W. N. GOLDSMITH, Dr. J. E. M. WIGLEY, Dr. L. FORMAN (hon. secretary), Dr. R. M. B. MACKENNA, Dr. B. C. TATE, and Dr. J. H. TWISTON DAVIES.

[3] Report of the Interdepartmental Committee on Medical Schools, 1944, p. 43.

TRIALS OF WHOOPING-COUGH VACCINES

IN conjunction with the medical officers of health of anchester, Tottenham, and Wembley, the Medical esearch Council are initiating field trials to assess the rotective value of pertussis vaccines. In these three reas, parents of children aged 6–12 months have been nvited to help by enrolling their children for inoculation within the next few months. The volunteer children are o be divided into two groups, one group receiving pertussis vaccine and the other group—the controls—an anticatarrhal vaccine. Details of the investigation are so arranged that no-one engaged in the day-to-day work of inoculation and subsequent follow-up will know which vaccine any particular child has received. The children are to be visited every month by specially appointed health visitors, who will take specimens for bacteriological examination from any child with a suspicious cough, and arrange for one of the doctors taking part in the trial to visit the child and make a clinical diagnosis. The results will be assessed at the end of two years.

In the propaganda to parents—mainly by pamphlets and personal visits by health visitors—all the details are fully explained. The enrolment of children has so far been encouraging. All general practitioners in the areas concerned have had a letter telling them about the investigation, and they have been asked to report any suspicious coughs in children included in the trial. The doctor will then be told immediately if whooping-cough is diagnosed by the special investigators.

In the first place American vaccines, as prepared for Professor Sauer, of Evanston, and Dr. Pearl Kendrick, of Grand Rapids, both of whom have claimed success with prophylactic vaccination, are to be used. The American vaccines have been chosen for trial because previous results obtained in controlled trials with a British vaccine had proved disappointing. If these prove satisfactory, further trials will be made with new British vaccines.

ANÆSTHESIA

ON Oct. 30 the Princess Royal unveiled at the Royal College of Surgeons a memorial with the following inscription:

> This tablet was erected in the Royal College of Surgeons of England by the Association of Anæsthetists of Great Britain and Ireland to mark the centenary of the first operation under anæsthesia in this country and to keep the memory of four British pioneers whose names will be held in honour from generation to generation
>
> HENRY HILL HICKMAN
> JAMES YOUNG SIMPSON
> JOHN SNOW
> JOSEPH THOMAS CLOVER

In his speech on this occasion Dr. A. D. Marston, president of the association, pointed out that two of the pioneers thus commemorated were members of the college, while one was a fellow; and he announced that a medal named after John Snow is to be awarded from time to time for signal service to the specialty. As recorded on p. 702, Dr. Marston presided next day at a centenary dinner held in Lincoln's Inn.

The main events and personalities of the story of anæsthesia were again reviewed in a fascinating address, delivered after a reception at the Royal Society of Medicine on Nov. 1, by Dr. Stanley Rowbotham, president of the section of anæsthetics. It was surprising, he said, how long man suffered pain without making purposive efforts to relieve it; how long he had the means at hand but did not use them; and how long their use, once discovered, was opposed. Beginning with Sir Humphry Davy, who in 1799 stopped toothache with nitrous oxide and suggested that this gas might "probably be used with advantage" in surgical operations, he spoke of the experiments begun in 1824 by Hickman, the first man to conceive of an anæsthetic state, and passed from the observations and practice of Faraday, Long, Clarke, and Wells to those of Morton, who by his enterprise and determination made anæsthesia an accomplished fact. Having shown a portrait of the first child delivered under an anæsthetic, who was of course baptised Anæsthesia, Dr. Rowbotham noted how the popularity of ether, chloroform, and nitrous oxide waxed and waned as new methods of giving them were devised. In 1884 local anæsthesia was introduced on the Continent, and it is still largely in use there because of the comparative scarcity of specialist anæsthetists. (Sir Gordon Gordon-Taylor expressed the opinion that surgery is not going to advance much further in European countries without an advance in their methods of anæsthesia.) Then came intraspinal, endotracheal, and intravenous techniques, basal narcosis, and curare.

The Society of Anæsthetists, parent of the R.S.M. section of anæsthetics, was founded in 1893, the first society in the world for the special discussion of the subject. The Association of Anæsthetists dates from 1932; the diploma in anæsthetics, which Dr. Rowbotham thinks has done more than anything else to raise the standard of anæsthetic practice, from 1935; and the Nuffield chair at Oxford, creating a great centre for teaching and research, from 1937. Contrasting the operating-theatre of 100 years ago with that of today, he was astonished at the difference already made in the removal of pain. What other branch of medicine could claim such progress in a century? "May the next hundred years be as prolific in its gifts to mankind."

TOO WIDE A GAP

OUR suggestion on Oct. 26 that, in an experimental training school for nurses, a medical dean of nursing might be appointed has proved unwelcome both to Miss Houghton (p. 693) and to the *Nursing Times* (Nov. 2, p. 836). The dismay which this proposal, made in full sympathy with nursing interests, has evoked is some measure of the gap now dividing the two main professions responsible for the welfare of the patient. Perhaps it will reassure our nursing colleagues if we add that in medical schools we should like to see a senior member of the nursing staff appointed to ensure that medical students get enough instruction in the principles of nursing, that they watch all major nursing measures carried out by experts, and that no young doctor enters general practice (as many do at present) grossly ignorant of one side of the care of the sick. We must not be afraid to learn from one another: it has long been the great pride of medicine and nursing that knowledge is freely shared.

THE BASIC SALARY

ON Monday the House of Commons, by 303 votes to 128, declined to say that remuneration of general practitioners in the National Health Service should normally be by capitation fees alone. Much was made of the advantages of a basic salary. But there would also be great advantages in reserving such a salary, as the House of Lords suggested, for circumstances in which it is clearly required. By accepting this arrangement the Government could have gone far to secure the willing participation of practitioners in the service. Happily the Minister's words, as reported on p. 697, allow us to hope that this question will be reconsidered in the coming negotiations.

Sir EDWARD THORNTON, late secretary for public health and chief medical officer for the Union of South Africa, has died at Pretoria. A former D.G.M.S. of the Union's Defence Forces, he later held the appointment of director-general of rehabilitation training. He was 68 years of age.

Reconstruction

MEDICAL ADVISORY COMMITTEES IN THE REGIONS

FROM A CORRESPONDENT

THE day is drawing near when the Minister of Health must appoint the regional boards. There has been a good deal of discussion about the area and functions of the boards, but comparatively little attention has been paid to their probable modus operandi. The object of this article is to point out that the regional organisation will in many important respects resemble that of a large hospital; and that in constituting the board the lessons of experience should play their proper part.

Detail, we are assured, will be delegated to the hospital management committees. Nevertheless, the board will eventually have to decide in broad principle questions which have agitated every hospital. For example, what share of the available funds shall be devoted to this or that form of medical advance? Shall effort be concentrated on tuberculosis, or on cancer, or on rheumatism? Shall the reconstruction of hospitals take precedence over the establishment of maternity units, or vice versa? There is no need to elaborate. In all such matters there is room for debate, and we cannot expect that progress will cease to be attended by a large diversity of opinion. Decisions of this order have in the past been the hard core of hospital management, and the regional boards will have to deal with them on a great scale.

What can experience teach us? The lesson is plain. It is that in the twin machinery of governing body and medical staff committee we have a pattern which it would be folly to ignore. The accepted practice in nearly all our great voluntary hospitals was well described in the recent debate in the House of Lords by Lord Moran:

> "In the voluntary hospitals there is a medical staff committee, composed, as a general rule, of all the staff. . . . It is the duty of each of those members (who are connected with every kind of special service) to keep their colleagues informed of any new equipment or any new development of knowledge, wherever it may occur, all over the world. It is a unique instrument for keeping the management of the hospital up to date in practical matters. When the members of the committee have been so informed and have decided whether their colleagues' proposal is or is not justified, then a number of them sit on the board of management . . . and try to convince the board that this or that should be done. . . . It is a measure designed to afford technical advice to the board of management so as to keep the hospital up to date in its administration."

People sometimes forget, however, that the efficiency of this well-tried machinery depends on the respective constitution of the two bodies, and may readily be destroyed if their functions are not kept distinct. Thus if too many doctors sit on the board, the effect is to transfer to that body discussions which ought properly to take place in the medical staff committee. The true function of the representatives of the medical staff committee on the board of the hospital is not to debate among themselves the pros and cons of different policies, but to convey to the governors the considered opinion of the medical staff as a whole. A wrong arrangement, sometimes made in deference to the desire to provide ample representation for the medical staff, defeats its own end: it confuses the lay body, and it mutilates the medical staff committee by removing from it the effective discussion of policy.

If then we are right in seeing a close analogy between the essential functions of the management of a great hospital and the work of the regional boards, it follows that very careful consideration ought to be given to their composition and to their relationship with the medical advisory committees which we hope to see set up alongside them.

The Bill lays down that a regional board shall include

- (*a*) persons appointed after consultation with the universities with which the provision of hospital and specialist services in the area of the board is to be associated
- (*b*) persons appointed after consultation with such organisations as the Minister may recognise as of the medical profession in the said area or the medical profession generally;
- (*c*) persons appointed after consultation with the local health authorities in the said area; and
- (*d*) persons appointed after consultation with such other organisations as appear to the Minister to be concerned

and the original members of the board shall also include persons appointed after consultation with such organisations as the Minister may recognise as representative of voluntary hospitals in the said area.

At least two of the members of the board shall be persons with experience in mental-health services.

Is there not a real risk that such a constitution may unwittingly, and with the best of motives, lead to the relegation of the medical advisory committee to entirely subordinate position? It may be said that the need is substantially met by the representation of the medical interests on the regional board *itself. But* a little reflection will show that this is a mistaken view. The medical advisory committee ought to enable the medical staff of the hospitals of the region to participate at first hand in the development of policy: it is the men who are actually working in the hospitals who know the real relative urgency of the need for this or that. Moreover, the medical advisory committee ought to reflect—as does the medical staff committee of an individual hospital—the whole range of medical work and all the various specialties: otherwise it is unlikely to achieve a balanced outlook on the needs of the hospitals. These needs will not be met by a team of men on the regional board selected in accordance with the schedule quoted above. The university men will be drawn from the teaching hospitals; the nominees of the profession will naturally and rightly include general practitioners; the local authorities will put forward their medical officers of health; and there will be very little, if any, room for the men engaged in active work in the non-teaching hospitals of the region.

It is not, therefore, a mere flight of fancy to press that a medical advisory committee for the region is a necessity and not a luxury. The regional machinery must embody the twin organisation that has served the hospitals so well in the past.

TWO OBJECTIVES

To achieve this the Minister must so manage matters that two objectives are kept in view. On the one hand, the claims of medical interests to representation on the policy-making body must not be allowed to obscure its essentially financial and administrative character. On the other hand, the link between the medical advisory committee and the medical representation on the board must be such that the committee feels itself able to make its voice clearly heard in the board's deliberations. Its own elected chairman, and perhaps its medical secretary too, ought to be among the most influential members of the board. If the boards must be constituted before the medical advisory committees, seats on the boards ought to be reserved for representatives of the committees.

These objectives may not be easy to achieve, but unless they are kept very much to the fore the hospitals in the regions may find themselves governed by bodies that lack the machinery for effective liaison with those who possess first-hand experience of the need. A lively and useful medical advisory committee in each region will remain a dream unless the arrangements now made are such as to enable it to play a real and not only a paper part in the determination of policy.

Special Articles

HILDLESSNESS AND THE SMALL FAMILY

A FERTILITY SURVEY IN LUTON

RICHARD M. TITMUSS   FRED GRUNDY
M.D. Leeds, D.P.H.

IT is well known that there are many gaps in ur knowledge of current reproductive patterns. The deficiencies fall broadly into two classes: (1) facts concerning marriage, birth, and the size of families, and 2) the causes determining these facts. This paper is chiefly confined to a study of some fresh material, and s mainly factual in content.

The last, and only, census in Great Britain which asked women who were married or had been married how many children they had borne was taken in 1911. Since then, the birth-rate has fallen by about 40%. Motives and values have been transformed. "All the known facts, supposed facts, acknowledged goals, dreamed goals, experiences and expectations about economic pressure, material inconveniences, and social ambitions"[1] which enter into the decisions of one generation of parents may be weighted by a different set of secret coefficients by the next generation. We need, therefore, in order to understand the problems of the contemporary family, something more up to date than the census of 1911.

The Population (Statistics) Act of 1938 required certain essential information, like the age of the mother and the number of previous children, to be supplied on registration of every birth. But this only tells us each year about the 5% or so of women of childbearing age who give birth to a child. We learn nothing about the women who have recently passed out of the reproductive period or of the younger women who remain childless. We can still only guess, therefore, about the incidence of childless wives. The Royal Commission on Population has recently been engaged in gathering much new material and analysing a mass of statistical data that have flowed into its hands and into the records of the General Register Office. So far, however, the commission has not reported, and the data that have been made available to it have not yet been published.

When, in the summer and autumn of 1945, a social survey was launched in the borough of Luton (population approximately 101,000) the opportunity was taken to obtain at the same time information about some of these matters. For a full description of the survey, its method and operation, reference should be made to *Report on Luton*,[2] which includes an account of the problems of the questionnaire, sampling, coding, and analysis, together with a set of population tables.

So far as the fertility analysis is concerned, informaion was obtained from samples totalling 3803 married women. The cards relating to these women have been dissected according to age, duration of marriage, social class, interval between pregnancies, birth wastage, and size of family. Some of this material has been drawn upon, and condensed, in the following tables. It is hoped to publish a full report later.

CHILDLESSNESS

Table I sets out the proportions of childless wives in Luton. Women married more than once, divorced, separated, widowed, or deserted by their husbands are excluded from this and subsequent tables; and any absence of husbands on war service has been disregarded.

Section i of this table is not, of course, comparable with sections ii–iv, because some, or many, of the women it examines may still bear children. We may, however, reasonably compare marriage durations of over 20 years, for not many women who have been married for that length of time and are still barren will have children.

Although it is commonly stated that there has been an increase in childlessness, this table does not confirm that supposition. Among those married under the age of 25 and for 20 years or more, for instance, the women who may still have babies show a smaller incidence of childlessness—less than 10%—than those who have passed their reproductive period. A division of the over-45 group into two subgroups covering all marriage durations—those aged 45–60 and 60 plus—shows a proportion of 19% for the former and 30% for the older generation. Among these two subgroups mortality has, of course, been operating to remove with advancing age a higher proportion of women from the sampled population. This process has probably been selective, but not so as to remove a smaller proportion of childless wives. Although the evidence is not conclusive, the studies that have been made of British material suggest that rates of mortality are lower among mothers than among childless married women. Some of the physiological factors which prevent childbirth also lead to earlier death.

The effects of mortality are therefore unlikely to explain the difference in the proportions childless in the two groups. The figure of 30% for those aged over 60 is unexpectedly high. One possible explanation, drawn from the history of the hat trade in Luton, is that the employment of large numbers of local women 30–50 years ago may have led to a higher incidence of childlessness, partly because of selective migration into the town, partly because of the economic inducements to remain childless, and partly because of the effect of bad conditions of work on the health of the women. If this is so, it means that the data for these older women are, from a national point of view, unrepresentative. Nevertheless, even if this percentage of 30 is discounted somewhat, there is still little in table I to suggest a rise in childlessness.

It may well be that the general belief in an increase of sterility and childlessness in recent decades is due to a

TABLE I—PERCENTAGE OF MARRIED WOMEN WHO HAVE NOT BORNE AT LEAST ONE LIVE CHILD*

Duration of marriage (yr.)	No. of women in group	Percentage of childless women among those married between age—						
		15–20	20–25	25–30	30–35	35–40	40–45	All †
i. Women aged under 45 at mid-1945								
0–5 ..	454	49	55	56	67	‡	‡	55
5–10 ..	667	18	22	32	32	38	—	25
10–15 ..	550	4	7	17	41	—	—	12
15–20 ..	379	0	9	21	‡	‡	—	11
20 plus ..	183	9	4	‡	—	—	—	6
All durations	2233	18	21	29	44	41	‡	24
ii. Women aged over 45 at mid-1945								
20 plus ..	1281	9	14	22	28	36	46	19
iii. Women aged 45–60 at mid-1945								
All durations	1049	12	11	18	31	49	‡	19
iv. Women aged over 60 at mid-1945								
All durations	490	8	22	25	35	53	‡	30

* In the total number of women at risk, all live-born children were included, whether surviving or not. Stillbirths and miscarriages have been excluded.
† All marriages under age 45.
‡ Number too small to be trustworthy.

---

1. Myrdal, Alva. Nation and Family, New York. 1941.
2. Grundy, F., Titmuss, R. M., and others. 1945. Luton: Gibbs, Bamforth & Co. (Luton) Ltd.

growing recognition of its importance in relation to the population question, rather than to any real enlargement of the problem. It is not impossible, too, that an over-diagnosis of sterility reflects a medical fashion of recent origin. But, whatever the explanation, the belief is not founded on ascertained fact, and the Luton material does not point to an increase of sterility.

The conclusion that there is no evidence of increasing childlessness could be invalidated if it were true that a larger proportion of women were not entering marriage, and further that those not doing so contained the group who would not, for physiological or psychological reasons, have had children if they had married. But, as the marriage-rate is very high in Luton, it is most unlikely that this factor of selective marriage is more important today than it was in the past. Much the same may be said for the country as a whole.

The proportion of Luton women aged 15–20 who were married was as high as 7·2% in 1945 (against 2·3% for England and Wales in 1939[3]), while at ages 25–35 83% were married (against 71% for England and Wales in 1939). By age 45 only 8% of Luton women remained unmarried. It would be almost impossible to raise the proportion above this level in Luton—or in the country as a whole. Such figures as these, expressing the high popularity of the social institution of marriage, provide, indeed, a greater reservoir of potentially childless marriages, and (it may be added) for divorces and separations.[4]

CHILDLESSNESS IN DIFFERENT SOCIAL GROUPS

The data comprising table I have been analysed according to the occupation of the husband, and the classification into social classes has followed that adopted by the Registrar-General at the last census. The number of women falling into social classes I and II is too small for the results to be significant, partly because Luton is pre-eminently a town of artisans, 62% of its men aged 20–65 being skilled workers, many of whom enjoy an income higher than most of the clerical and professional groups allotted by the Registrar-General to class II. The Luton material has, therefore, been analysed for two groups, (*a*) skilled workers (social class III), and (*b*) semi-skilled and unskilled workers (social classes IV and V).

Among women aged under 45 in 1945 the proportions childless are:

—		(*a*) %	(*b*) %	All social classes, including I and II (%)
Duration of marriage	15–20 years ..	11	11	11
	20 years and over	6	7	6

For those aged over 45 in 1945 with a marriage duration of 20 years and over:

—	(*a*) %	(*b*) %	All social classes, including I and II (%)
Age at marriage 15–20 yr. ..	11	10	9
„ „ 20–25 yr. ..	14	12	14
„ „ 25–30 yr. ..	24	19	22

Here again there is nothing to suggest a rise in the proportion of childless wives. Nor is there anything to warrant the prevailing idea that childlessness is commoner among those in classes I and II. There may be more childless wives because the age at marriage is higher in the higher income groups, but given the sa age at marriage then there does not appear to be m difference in the incidence of childlessness among soc classes—at least in Luton.

CONTROLLED PARENTHOOD

While the Luton fertility tables do not show that greater number of women are remaining childless, wh they do reveal is the extent to which controlled paren hood is today being exercised by all age-groups and soc classes. In table I, for instance, it is shown that afte an average of 2½ years of marriage only about half of the wives had had a child, and that after 7½ years a third of all the women married at 25–35 were still childless

TABLE II—PERCENTAGE OF WIVES AGED UNDER 45 IN 194 HAVING AT LEAST ONE OR TWO CHILDREN WITHIN THE FIR FIVE YEARS OF MARRIAGE

Duration of marriage at mid-1945 (yr.)	Women married between age—							
	15–20		20–25		25–30		30–35	
	Children		Children		Children		Children	
	1	2	1	2	1	2	1	2
5–10 ..	81	42	65	17	55	11	57	11
10–15 ..	87	41	73	25	59	10	54	9
15–20 ..	87	42	77	23	70	22	—	—
20 plus ..	77	38	82	29	—	—	—	—

TABLE III—DISTRIBUTION OF LIVE-BORN CHILDREN TO WIVES AGED UNDER 45 IN 1945 AFTER A MARRIAGE DURATION OF 10–15 YEARS

Women married between age—	Percentage of wives with the following family sizes—						Mean number of children per married woman
	0	1	2	3	4	5 plus	
20–25	8	34	33	16	5	4	1 90
25–30	19	41	26	10	1	3	1·41

It has long been recognised that earlier marriages are more fruitful of children than late ones. This has been true even when marriages contracted between ages 15–20 and 25–30 are compared. Thus the 1911 census showed that after 2½ years of marriage the number of children born to 100 wives married at 15–20 was 60% higher than the number born to those married at 25–30 The corresponding figure for Luton women in 1945 was 23%.[5] A change of this order strongly suggests that the degree of parenthood control, hitherto exercised by women marrying in the late twenties and early thirties, is now in process of being adopted by those marrying at earlier ages. The trend is towards a uniform pattern of reproductive behaviour within marriage. As there is a close correlation between social class and age at marriage—generally speaking high social status means high marriage age—then it seems likely that this development of uniformity applies to class fertility as well as to age-group fertility. Thus we should expect to find, when national data become available to compare with the 1911 material, a much smaller class fertility differential

Tables II and III present other aspects of current reproductive habits.

In reading these two tables it should be borne in mind that over half of all wives are married between the ages of 20–25. Next in importance to these ages is the group 25–30. Together, these two groups account for nearly 80% of all wives. It is the contribution made by these women which mainly determines the level of the reproduction-rate.

In table II, and examining first the most recent marriages, we see that after 5–10 years about twohirds of those married between 20–30 had had one hild, while only about 15% had had two children. Women of these ages who have had only one child in he first 5–10 years of marriage are unlikely to end heir reproductive days with a family of four or more. Yet the 1911 census found that among the great group of wives married at 20–25 and whose marriages were contracted in 1851–61, the commonest size of family was ten. In 1945 the potential for large families in a similar age-group, who were married between 1935–40, was only 17%. But while this 17% may go on to three or more children, the next group of women who married during 1940–45 between ages 20–25 may provide an even smaller potential. For, as can be seen from table II, the proportion has fallen sharply from 29% (those married before 1925) to 17% (those married between 1935–40).

---

[3] Later figures have not been published.

[4] It is a common mistake, particularly evident in the popular press, to assume a greater incidence of broken homes because the number of separations increases. But this is not necessarily so; and they should be measured against the numbers exposed to the risk of separation.

[5] This percentage may be abnormally low because of war-time marriages among young people, and the incentives for women to have at least one child. But such factors cannot explain away the difference between 23% and 60%.

This particular story is taken a little further in table III. The marriage duration of 10–15 years has been selected because it may reasonably be assumed that, after this period of married life, the *ultimate* size of the family has been more or less set by the vast majority of couples.[6]

What is most striking about this table is that for both those married at 20–25 and at 25–30 the *commonest* family size was one. At the time of the survey the age of these women ranged between 30 and 45, with a mean of approximately 37. When the childbearing days of these women are over no doubt the 19% of childless wives married at 25–30 will have been reduced, while some of the one's will have moved up to the two's. But is it likely that many of the 75% (married at 20–25) and 86% (married at 25–30) who had less than three children after a mean of 12½ years of married life will finish with three, four, or five children?

PREGNANCY SPACING

To supplement the Luton fertility survey, which covered the childless and childbearing women of all ages, an analysis was made of the pregnancy histories of all married women who bore a live child during 1945.[7] A total of 1961 women entered the tables, and they were grouped as to:

		%
714	first pregnancies	36
630	second "	32
325	third "	17
140	fourth "	7
152	fifth plus "	8=100%

A study of the interval between marriage and the first pregnancy showed that, among women aged 15–20 in 1945, all the pregnancies (52) occurred in the first three years of marriage. In the group aged 20–25, more than three years elapsed before 26% recorded a pregnancy; at ages 25–30 the proportion was 62%, and at 30–35 as high as 81%. At all ages combined, 53% of the wives giving birth to a live child in 1945 had a pregnancy during the first three years of marriage, and a further 18% did so in the next two years. In other words, nearly a third of these fertile women had been married more than five years before having a pregnancy.

As regards second pregnancies, only 29% of all the wives reported one during the first five years. For 50%, between 5 and 10 years elapsed before a second pregnancy occurred, and for 21% more than ten years.

Very few third pregnancies were recorded in the first five years (only 11%), 48% between 5 and 10 years, and 41% thereafter. When fourth and subsequent pregnancies are analysed, it is seen that less than 2% of all wives might be said to be continuously childbearing, for this was roughly the proportion who had had four pregnancies in the first five years of marriage. Of such pregnancies 60% occurred after ten years (20% after fifteen years), and 80% of fifth plus pregnancies after ten years (40% after fifteen years).

TABLE IV—SIZE OF FAMILIES. RELATIVE FREQUENCY OF FAMILIES OF DIFFERENT SIZES BORN TO WIVES MARRIED AT AGE 20–25

Children born	Luton: Wives aged under 45 in 1945 whose marriages had lasted 15–20 years	Luton: Wives aged 45–60 in 1945	Luton: Wives aged 60 plus in 1945	England and Wales (1911 census): Wives aged 50–65 in 1911
0 ..	10	11	22	6
1 ..	33	26	22	4
2 ..	28	26	13	6
3 ..	13	13	13	8
4 ..	9	9	7	9
5 plus	7	15	23	67
—	100	100	100	100

To summarise these results for all married women having a live-born child in 1945:

Women reporting a second pregnancy—
for 71% over five years of marriage had elapsed.
Women reporting a third pregnancy—
for 41% over ten years of marriage had elapsed.
Women reporting a fourth pregnancy—
for 60% over ten years of marriage had elapsed.
Women reporting a fifth or subsequent pregnancy—
for 40% over fifteen years of marriage had elapsed.

These figures express in concrete form the extent to which controlled parenthood has now become a part of the married lives of all sections of the community. Their effect on family size may be gauged by comparing the data for women who had not reached the age of 45 in 1945, but whose marriages had lasted between 15 and 20 years, with corresponding data for women whose reproductive days were over (table IV).

The large family of five or more children is, it seems, fast disappearing. The full psychological, social, and economic consequences of the changes in family size depicted in table IV have not yet been experienced. While great numbers of middle-aged and elderly people alive today have, or have had, a large supporting circle of brothers, sisters, and relatives, this will not be true of the children born of contemporary fertility patterns. We do not yet know what kind of problems will arise, and what type of society will be fashioned, by the generations composed of large numbers of one-child and two-child families when they reach maturity and responsibility. All the signs point to a—physically—healthier society. But in other respects there may be losses, for in the absence of biological supports and the safety-valve of religious exercise, the central issue of the future may well be, in Fromm's words, the problem of "moral aloneness."[8]

CONCLUSIONS AND SUMMARY

A study has been made of a few aspects of the problem of parenthood as revealed by a sample fertility survey in the industrial town of Luton. It would, of course, be wrong to assume that what is true of Luton is also true of the rest of the country. Other towns, such as Liverpool or Glasgow, with dissimilar social structures might show different patterns. Moreover, it should not be forgotten that many of the facts presented here reflect the abnormal war-time phenomena of high and youthful marriage-rates, and a consequent piling up of first births. These factors tend to distort comparisons with pre-war years. Nevertheless, it may reasonably be claimed that the facts reported roughly indicate the

---

[6] If 1 or 2 children have been born within this period, then the size of the family when childbearing is completed may be 2 or 3, but it is unlikely to be 4 or 5.

[7] By present husband. These histories were obtained in respect of women delivered by midwives, in the borough's maternity home, in private practice (including private nursing-homes), and in the public assistance institution. It was interesting to note how atypical were the cases handled by private practice, for while as many as 54% of the women were aged over 30 84% of the pregnancies were first and second.

[8] Fromm, E. Fear of Freedom, London, 1945.

order of magnitude of the problems studied as they obtain today in the mass of industrialised communities in England.

Throughout the war of 1939–45 Luton's birth-rate—e.g., total live births related to total resident population of all ages—was higher than that in the country as a whole. Yet in 1945, when Luton's rate stood at 18·9 per 1000 population (as compared with 16·1 for England and Wales), the number of live births to 1000 married women aged 15–49 was only 88 in contrast to a figure of 92 for England and Wales in 1938. On the other hand the net reproduction-rate in Luton was above unity—namely, 1·03 for 1944–45—while this index stood at 0·95 for England and Wales. As Luton's birth-rate in 1938 was higher than the national rate in the same year, it seems, from a comparison with the figures for 1944–45, that the relatively large number of births in the town during the war years has not meant any increase in fertility *within marriage*. There were many more marriages, especially youthful ones, and a rise in the proportion of first-born children. It is highly probable that a corresponding development took place in the rest of the country, but until comprehensive national data have been published we cannot be sure.

The more notable biological facts reported in this paper may be summarised as follows:

(1) There is no evidence of any increase in the proportion of childless marriages over three generations, and (given the same age at marriage) no marked social class differences.
(2) The degree of control over childbearing within marriage, hitherto exercised by women marrying in the late twenties and early thirties, is now in process of being adopted by those marrying at earlier ages.
(3) For many wives there is now a long interval of time between marriage and the first pregnancy, and between first and subsequent pregnancies.
(4) Only a small proportion—less than 2%—of all wives can now be described as continuously childbearing.
(5) A large increase has been noted in the proportion of one-child and two-child families in recent years, and a dramatic fall in the proportion of families containing five or more children.
(6) The trend towards a smaller family size continued during the war—despite a rise in the birth- and reproduction-rates.

OUR MENTAL HOSPITALS

REPORT OF THE BOARD OF CONTROL FOR 1945

DURING the war the Board of Control ceased to publish their annual reports; so the report for the year 1945, the first to appear since 1939, has much to tell—and, surprisingly, much that is cheering.

Mental hospitals and mental-deficiency institutions evacuated 25,000 beds at the outbreak of war, thus putting space for some 42,000 beds at the disposal of the Forces and the Emergency Medical Service. In the hospitals to which the displaced mental patients were removed this meant overcrowding amounting at one time to 16%; and those who were then working in mental hospitals well remember the gloomy prognoses the sight of the close-packed beds invited. Yet few of the fears were fulfilled: certainly the death-rate increased during the early years, reaching in 1941 a point 33% higher than the pre-war average; but thereafter it slowly fell, until in 1945 it was just below the rate for 1935–39—68·4 per 1000 patients compared with 68·5. The death-rate for women in 1943 was 64 per 1000, among the lowest ever recorded; and it is curious to note that this happened when the shortage of nurses was greater than at any time during the century. This record may be compared with that of the previous war, when by 1918 the death-rate had risen to a maximum of 203 per 1000, or 111% over the pre-war quinquennial rate.

Nor was the increase of tuberculosis as devastati as had been expected. The incidence of fresh cas rose from 5·6 per 1000 in 1939 to 11·3 in 1941, but th began to fall, reaching 7·2 in 1945. The death-rate fro tuberculosis, which was 3·8 in 1938 and 4·1 in 1939, ro to 9 per 1000 in 1942, but had fallen to 5 in 19 Similarly the death-rate from dysentery showed temporary rise, reaching a peak in 1941, then quickl returning to the 1938 level; by 1945 it was only 0 per 1000 patients.

THE RULING FACTOR

What was the cause of this gradual change for th better, starting in mid-war? Evidently it cannot be put down to any improvement in living conditions, for the were throughout worse than in the 1914–18 war, when the death-rate in mental hospitals steadily rose. Overcrowding was greater in the recent war, blackout more strict, ventilation poorer, staff shortage more acute, enemy action more violent. Certainly the diagnosis of tuberculosis was made earlier, thanks to the intensive use of X rays; and the treatment of dysentery is nowadays more successful; but these measures alone could not have changed a main trend.

After the 1914–18 war the board concluded that reduction in quantity and deterioration in quality of food supplied to the patients was the chief factor inducing the increased sickness- and death-rates in mental hospitals. This time the board were on their guard. Mental patients customarily lose weight in the first two years of their illness, but in 1941 the board initiated studies to decide whether the losses were greater than in the pr war years, and also whether overcrowding was havin an effect on weight-loss. The degree of overcrowdin existing at that time was found to make no differenc to the proportion of patients losing weight; and fro 1941 onwards the situation righted itself, weight-los reverting to the pre-war range.

> "The recovery was due, we believe," the board wri "to the changes induced in the latter half of 1941 as a res of which the food situation improved, and also becau we became food-conscious and much was done to impro the quantity and balance of the diet."

Dietaries were investigated not in the rosy light the official diet sheet but by studies of the bulk issu of food over a period of four weeks. The mean val was found to be 2360 calories daily, ranging from 19 to 2731, whereas, since 1941, the level in the gener population has been 2800 calories. In about half th hospitals the amounts of vitamins included in the foo was below the League of Nations level. The analys enabled a large number of hospitals to change the diets and particularly to improve the supply of vitamin C and A; on the whole the board feel that from 194 onwards the diet was satisfactory, and they attribute th better health and welfare of the patients largely to thi change.

In the early days, however, nobody could foresee th comparatively happy outcome, and many mental-ho pital doctors and nurses felt indignant at what seeme a cynical disregard of their patients' welfare. It is wort noting in passing that their discontent could have bee changed to willing support if a member of the board, a Government official, however minor, had visited th hospitals and explained to the assembled staff in te minutes what the relinquished space meant to the natio at large. It is imaginative dealing with the peop on the spot which makes the difference between a happ and a disgruntled service—a point worth bearing in min when the National Health Service is established.

WAR AND MENTAL HEALTH

The effect of the war on the mental health of th community has been impossible to estimate. Th train imposed by air attacks and family anxieties was artly offset by opportunities for full employment, a etter standard of living, and the stimulus to the spirit f team-work in an important cause. Admissions to nental hospitals in 1940, 1941, and 1942 were lower, he board report, than the average for the five years before the war. By 1943 they had exceeded this average, and continued to rise in the next two years, reaching 33.961 in 1945, the highest number on record. But no fewer than 50·7% of these admissions were voluntary, and the patients discharged that year amounted to 71·7% of the direct admissions—also the highest figure on record. The percentage of patients, calculated on direct admissions during the year, who left mental hospitals recovered or relieved was 63; and for recoveries alone the figure was 33·2. The percentage of absolute discharges (including those who were not improved and 150 who absconded) was 71·7, compared with 66·8 for the preceding five years. The average annual percentage for the five years before the operation of the Mental Treatment Act, 1930, was 48·3.

DEMAND AND SUPPLY

The hospitals, in fact, are being used earlier and willingly by people with incipient mental illness, and a continued rise in admissions is therefore possible. To meet it we have old buildings, too few beds, and a staff shortage. At the end of 1945, bed-space for 17,020 mental patients still remained in the hands of the Services and the E.M.S., and a further 847 beds were not in use because they could not be staffed. For mental defectives, especially, it is often difficult to find institutional vacancies even when their need is urgent. The board draw fresh attention to the report of the Athlone Committee's subcommittee on the mental-nursing service, in which better conditions of service for the mental nurses were advocated.

SERVICES AFTERCARE SCHEME

In 1943, at the request of the War Office, the board founded a scheme for aftercare of ex-Service patients discharged from hospitals and E.M.S. centres on account of psychiatric disability, and in 1944 merchant seamen were included. The Ministries of Pensions, Labour, and Health, the Provisional National Council for Mental Health, and the Mental After Care Association all gave their help in this specialised form of reablement, and up to September, 1945, some 7800 patients had been referred to the board for help. The Provisional National Council arranged for patients to be visited in hospital by a trained social worker; and regional aftercare officers look after them in the areas to which they are discharged. No patient is referred unless in the opinion of the commanding officer he or she needs aftercare and has expressed willingness to receive it. As new cases are referred those whose needs have been met are closed down, but in 1945 new cases were still outrunning the numbers requiring no further help. The board note that the scheme could be extended and help given to other members of the Forces were it not for the shortage of trained psychiatric social workers.

They have been closely concerned with plans for integrating the mental-health service with the National Health Service. One aspect of this calls for the rewriting of the Lunacy Code, a task which would already have been undertaken but for the war. In 1926 the Royal Commission advised that the code should be recast and simplified, and the need is now urgent since the National Health Service Act will modify the Mental Treatment and Mental Deficiency Acts.

The report as a whole gives a picture of a promising and improving service badly hampered by lack of nursing staff and proper buildings. The staffing of mental hospitals is a part of the whole nursing problem, which is still not being faced realistically.

In England Now

A Running Commentary by Peripatetic Correspondents

I THOUGHT that I had attained to that sublime pose for which the tag of Horace serves as slogan—nil admirari—but my self-esteem has received a rude shock, for I am full of wonder. I have just returned from a brief visit to our hospitals in the Middle East, where I found the hygienic conditions contrasted so favourably with those of the last war that it seemed as if a miracle had been performed.

Thirty years ago I landed with a large medical unit at Basra, and within a fortnight half the officers were sick and in hospital. At that time flies and mosquitoes swarmed round the camps, dysentery was rife and malaria dangerously common, while the river steamers were crowded with sick on their way to India. Heavy chlorination gave the drinking-water a strong antiseptic flavour. For more than two years my daily ration for a bath was a petrol tin filled with water, which was carefully poured into the shallow canvas bath which each officer carried in his kit. The thought of an immersion-bath was a dream of Paradise. Latrines were primitive and the incinerator a prominent feature of the landscape. A commission which was sent out from England to inquire into hygienic conditions soon demonstrated the need for improvement since three out of the four members soon fell sick and it fell to my lot to treat them.

But their work and that of their successors has borne fruit. Today, hygienic conditions are immeasurably better. Malaria control has worked wonders. During a three weeks' visit I saw fewer mosquitoes than I do in a London garden in one day. The regular use of D.D.T. has almost banished flies; the water is pure and tasteless. The sickness-rate among the troops is but a quarter that of the last war. In the various hospital camps one can always have the luxury of a cold shower-bath, and sometimes even hot water is laid on. It only added to the interest to find that in one camp a toad appreciated the same amenities as the members of the mess. We thought the acme of luxury was the flushing water-closet far away in the desert.

The only sad and deeply felt regret came when one saw the huge cemeteries filled with those who would almost certainly have been saved if similar conditions and precautions had existed thirty years ago.

* * *

My wife says it's her turn: so over to her.

At 3.45 A.M. the phone rings. "Poor old boy, you'll have to get up," I mutter thickly into the darkness. An awful blast of cold air and even colder invective makes me curl up and pull my nightdress around my toes. He gets up, his super renal whatnots working at high pressure. From a long distance I hear that there has been an accident, so I roll over to keep his side of the bed warm.

How I envy those efficient wives who, when their husbands are called out, turn over and go to sleep in an instant! My imagination is too much for me (I often wish he would share some of it with me, but he is usually too busy), or perhaps my renals are super super ones; anyway, I call out fit to wake the children, "Don't forget you took the bag out of the car, darling." He hisses back in the manner of Gielgud, "Sweetheart, I have remembered." Why do they get so angry with us, as we try to help? Poor chap, it's not my fault you get called out. It's something to do with his glands that he gets het up. He says he's a Kretchmer's picnic . . . the real trouble is that they all like to appear so efficient; any suggestion, any hint from us. . . .

The bed is warm now; how nasty to be lying on a roadside cut by glass . . . cold . . . shivering . . . surgical shock supervened. . . . "At the inquest Dr. Prem said that death was due to shock consequent upon the injuries." How nice he looks in his dark suit; the Coroner smiles faintly, "Thank you, doctor." Dr. Prem left the witness stand, his monumental calm, the air of faint resignation . . . so certain . . . so impregnable. I roll over in bed. "Phooey" I say aloud into the darkness.

I hear a train come into the station and the sound of boxes being dumped on the platform. Fish. I must queue up early again. In a few minutes the milk train will be in. I remember listening to them like this the night Pauline had her second. Fish and milk, babies and chores, and queues. They are packed like sardines waiting to see the doctor, I have to wait patiently in a long reptilian queue to get sardines: there is nothing funny in this any more.

I doze and then wake with a start to the sound of a siren. It is the whistling kettle. He is going to bring me tea and we are going to sit in the half light of dawn and he's going to tell me what happened. He brings me the tea and gets my bedwrap. He lights a cigarette, the smoke comes out through his nose and he begins, "They moved them off the road and took them into a luxurious nature cure place. . . ." We laugh happily. Just between you and me—it's going to be a wonderful day today.

* * *

Within a twelvemonth I have climbed in England, Scotland, Ireland, and Wales. More: I have achieved my Lakeland majority, for a few days ago I returned from my twenty-first visit to the Cumberland Fells.

"I know those slopes: who knows them if not I?" sang Matthew Arnold, and I feel qualified now to claim the same familiarity with the route from Sty Head to Sca Fell as with the exposure of the saphenous opening after many (too many) years in the Royal Air Force.

And how much nicer, I have been reflecting, are the Cumbrian names than those of the other mountainous parts! Stickle Tarn and Scale Force; the simplicity of Gable and Pillar—contrast these with Lliwedd or Clogwyn Du'r-arddu, which may mean something to a Welshman, or with Stuc-a Choire Dhuibh Bhig, which a Highlander has the satisfaction of knowing means the peak of the little black bastards, or something to that effect. True, Crib Goch (Wales) and Suilven (Scotland) have stern uncompromising names suited to their appearance, but they lack the music of Watendlath or the fantasy of Dollywaggon Pike. Ireland fares a little better. Errigal and Muckish, Hungry Mountain, and the Poisoned Glen immediately suggest visions of the Little People, but Sgùrr a' Mhadaidh or y Ddysgl suggest nothing at all to a Sassenach, unless it be a comparison with such horrors of medical terminology as axonotmesis or dysdiadokokinesis, which, even if you know what they mean (and it is usually something pretty simple) are completely unpronounceable.

Incidentally, names aren't the only things which are more attractive in the Fells than in the Highlands or Snowdonia. Why, even the sheep look more intelligent, and as for the natives themselves—but those are deeper waters. Anyway, what Scot or Celt could possibly have thought of calling a mountain track anything so delightful as Moses Trod?

* * *

The Ministry of Food's appeal to doctors to go easy in issuing certificates for priority milk cuts at the very tap-root of medical practice—the doctor-patient relationship. The doctor's first loyalty, we keep saying, is to his patient: and here we are being asked to consider the interests of the community, as represented by the "normal consumer."

The doctor knows all about the troubles of normal consumers—he is usually one himself—but that doesn't make it any easier to refuse the plea of old Mrs. Muggins up the road, even though one suspects that most of the 14 pints a week that she gets for her duodenal ulcer goes into the plates of her three sons' wheat flakes.

As a fellow peripatetic remarked the other week, we doctors never asked to be the controllers of the nation's milk-supply, and we would be heartily glad to be rid of the whole time-consuming and thankless job. But nobody else is capable of taking it on, so we must make the best of it. What we are asked to do is to make a 44% cut in present certificates, and at least that would be saved for normal consumers if we could limit our certificates to people in the specified categories who are really going to drink the milk. The post-ulcer class is the one to keep an eye on, and I bet my boots that if they are cut down to the amount they actually drink we shall reach the 44% target with ease. We may have to instal a few chuckers-out in our surgeries, though. Will the Ministry of Food compensate us for loss of patients and for personal violence incurred in the exercise of our duty?

Letters to the Editor

CORONARY DISEASE

SIR,—In his Harveian Oration, based on his own larg experience, Sir Maurice Cassidy returns to the vexed question of ætiology which has so long employed th minds of all physicians having an interest in angin pectoris.

It is now apparent that we shall make small progre with our ætiological inquiries while we continue to confin our researches to individual studies in the ward, th consulting-room, the home, and the dead-house. This is a disease of prevalence, a community disease, with particular age and sex associations and a rising national incidence which must surely be related to social changes and to occupational or habitual factors. What, in fact, are the most striking changes in the conduct and conditions of our lives accompanying the steady increase in the disease? The amount of mental work and of mental and emotional stimulation now possible in the course of a single day is something far in excess of anything experienced by our ancestors. The time has come to accept that the pace and pressure of life and their physiological consequences for neuromuscular systems are no longer things to be ignored, as *malnutrition in relation to other sickness and mortality* was ignored until a few decades ago.

Reference to the Registrar-General's Decennial Supplement (1930–32) and to the social post-mortem examinations which this volume so usefully and graphically illustrates reveals important evidence. The standardised mortality ratios for angina pectoris, grouped according to social class by occupation, indicate that the male death-rate for social class I (professional classes) is nearly 3½ times that for classes IV and V (working classes), the intermediate classes II and III showing an intermediate gradient. The tables disclose further that, whereas in class I the standardised ratio for males is much in excess of that for married women and equal in class III, it is in defect in classes IV and V.

All this evidence would seem to suggest that—setting aside the partial contributions of age, sex, and heredity—conditions of life and work must play an essential part, and further that particular forms of social and occupational experience are as surely responsible factors as are those forms of social experience which weight the scales in favour of the professional classes and against the working classes in the case of tuberculosis, rheumatic heart disease, gastric (but not duodenal) ulcer, and cancer of the skin and stomach. In an analysis of a serie of private cases of coronary thrombosis a few years ag I found (after excluding, in order to discount the agein factor, all cases at and over 60) that I had noted th coincidence of heavy mental or emotional strain in 40% of the remaining male cases. I had been making n ad-hoc study of ætiological factors during the years i which the records were accumulated.

When we come to a closer consideration of occupationa influence we find (again from the Registrar-General' tables) that medical men and the members of othe intellectual professions in a less degree have a muc worse experience in respect of angina pectoris than an of the manual occupations. Taking 100 to represen the death-rate for all males between ages 20–65, th comparative figure for agricultural and gardener labourers is 32; for coal-miners below ground 40; fo bank and insurance officials 183; for the Anglican clerg 218; and for physicians and surgeons 308. Whe modern "psychosomatic" theory has tended to stres the importance of emotional conflict and repressio (which largely reflect temperament) social statistics an clinical histories make a stronger case for such facto as mental overactivity or strain and the day-to-da cares of sustained responsibility, which largely refle types of employment.

More intimate sociomedical investigations of all th prevailing chronic diseases of our age are now neede The "multiple stress" diseases and accidental injuri in the western world are as worthy of epidemiologic inquiry as the diseases due to infective agents. The now cause more loss of life and efficiency and call fo a greater expenditure of time and money than th ommunicable diseases. Like these they are due to a omplexity of causes which vary with time and place nd social change and which can, by appropriate methods, e unravelled. Unlike them they lack a specific factor which can sometimes be specifically countered. But social onditions and modes of work and habits are—albeit lowly—alterable things.

Oxford. JOHN A. RYLE.

NURSING

SIR,—The "experimental school of nursing" advocated n your leading article of Oct. 26 would be a useful piece f work, and certainly the time has come for some ractical research into nursing techniques and the art f nursing as distinct from medical care.

I should not like to see the research progressing along he lines of exploration of the possibilities of a two-year asic course. The assistant-nurse training is the simple ourse in elementary nursing arts, and would in my pinion not be suitable for the girl of good education, who is interested in theory as well as practice, and can bsorb both at a greater speed and to a greater degree han the type of candidate for whom the assistant-nurse ourse has been devised. The assistant nurse can always ass on to full training if she proves suitable.

I do not quite see the reason for the proposal of a 'medical dean" for a nursing school. I would prefer a chool committee with a nurse as chairman, and represen-ation from the medical committee.

I fully agree that any nursing course based largely on the medical curriculum is likely to be unsatisfactory, but there must always be correlation between medical and nursing teaching. Ward and departmental sisters should have a definite share in the teaching of the curriculum, and an investigation into the number of patients for whom they can adequately care in addition to their teaching duties might well be made.

University College Hospital,
London, W.C.1.

MARJORIE HOUGHTON
Sister-tutor.

INFECTED FOOD

SIR,—Organisms of the food-poisoning group may be excreted by patients, after the cessation of clinical symptoms and signs, for a longer period than is generally realised. Only three cases of *Bacterium typhimurium* enteritis were encountered in my laboratory during the last year, but two gave positive stools after many weeks.

A married woman, aged 35, was ill for only a few days but was still excreting salmonella organisms in fair numbers 12 weeks after the initial infection. After the first weeks she was in good physical condition and continued her normal activities. Unfortunately contact was lost after the twelfth week, so it was impossible to learn the full time the carrier state persisted.

A married woman, aged 70, was ill for a longer period but was still excreting *Bact. typhimurium* 16 weeks after the onset. During this time, in an attempt to stop the carrier state, cholecystectomy was performed, but the gall-bladder, although containing stones, was sterile and excretion of the pathogen continued, although in scantier numbers. At the end of 16 weeks the fæces were still positive but the patient was in good health and engaged in her usual activities. Contact was unfortunately lost at this point and the complete time the excretion of the salmonella continued could not be recorded.

If these women had worked in a large feeding-centre an outbreak of enteritis would have been inevitable sooner or later.

The routine investigation of all "food-handlers in feeding-centres" would be of great value, but of still greater value would be the fæcal examination of all kitchen staff who develop any kind of "digestive upset," whether this caused absence from work or not. Conditions of temporary or permanent dysentery or salmonella carrier states would thus be detected.

It would be good too if doctors would become more preventive-medicine minded. On a number of occasions on inquiry into fæces results in cases of enteritis I have heard words to the effect that "the diarrhœa only lasted a few days and soon cleared up and the patient is quite well; it didn't seem worth sending a specimen." That the patient could have become a possibly dangerous carrier of an intestinal pathogen, and the significance of such a condition if established, had not been appreciated.

Downe, Kent. R. IRENE HUTCHINSON.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—I admire those pioneering surgeons who refuse to be bound by tradition and who try to profit by their observation and experience in devising new methods of treatment. Only this morning with early tea I read from Osler[1]: "Undue reverence for authority as such, a serene satisfaction with the *status quo*, and a fatuous objection to change have often retarded the progress of medicine." But we must be sure that any particular change really means progress.

The statement that some cases of ruptured peptic ulcer recover spontaneously came as no surprise. During the several years that I acted as surgical registrar in the old Newcastle-upon-Tyne Infirmary during the opening years of the century, it was my fortunate lot to make the post-mortem examinations on cases dying in the surgical wards. I recall how often the patient evidences of old inflammatory trouble about the stomach and duodenum, not otherwise explained, suggested the probability of previous perforation. Sometimes the presence of an ulcer or a scar or a typical history was confirmatory. I became so convinced of this possibility that I stated it as an accepted fact in some of my writings (Perforation of the Stomach, &c. *Med. Pr.* Sept. 4, 1912). In those days the mortality in ruptured ulcer was appalling, but just about a year after the publication of that paper I had a clinical experience confirming the truth of the statement.

In August, 1913, I was asked to see an abdominal emergency in a farmer of 60, at his home in what was then a remote part of Northumberland. This man had suffered from stomach trouble for 25 years and had taken "stomach bottles" off and on during the whole of that time. Some 26 hours before my visit and 2 hours after he had vomited a meal, the patient was seized by sudden severe pain with collapse and acute abdominal tenderness. When seen by his own doctor 2 hours afterwards the man was white, cold, collapsed, sweating, and in severe pain. Altogether the condition was very alarming. After a total dose of gr. $^1/_2$ of morphine the patient got relief and sleep.

When I saw the patient next day he was still very ill and looked dusky. The abdomen was not distended but was very tender in the upper part and the liver dullness was completely replaced by a tympanitic note.

We concluded that there had been perforation of a duodenal ulcer. Immediate operation was considered but accommodation in the small farm-house was poor, night was coming on, and candles were the only means of illumination that could be brought to the table. The practitioner and myself were alone, no nurse or other assistant being available, and I had only my small emergency bag with me. To move the patient to Newcastle would have meant a slow tedious railway journey of 46 miles. In view of all these circumstances we decided that the patient would have the better chance if left at home and treated by repeated small doses of morphine with minimal quantities of liquid by mouth.

The patient slowly improved, and a week later was well enough to be moved to Newcastle where an operation was carried out. On opening the abdomen there were unmistakable signs of a leaking duodenal ulcer with local extravasation. The involved area of duodenum was oversewn and gastro-enterostomy performed. After a rather stormy convalescence the man made a complete recovery, and 20 years afterwards, when in his 80th year, he wrote to tell me of his continued good health.

In those days I saw so many disasters associated with the calamity of perforation that I never again had the courage to leave a case without surgical intervention if operation seemed practicable. In some few cases of long-standing perforation the condition was so precarious that it was considered that the chances of recovery would be better with minimal interference, such as the insertion of a suprapubic or right iliac fossa drain, but in every such case the patient died.

While perforation is usually one of the most straightforward diagnoses in abdominal surgery, we must recognise that sometimes it may be very difficult to come to a correct conclusion in spite of all the aids. I have to confess that more than once I have opened the abdomen only to discover that perforation was not present. During the last few years I have seen at least four such cases at Hammersmith Hospital and in two gas was actually demonstrated by the X ray below the diaphragm, and yet subsequent exploration failed to confirm that perforation had occurred.

---

[1] British Medicine in Greater Britain. Aequanimitas. London, 1904.

Further, the very cases in which conservative treatment might be tried are those which yield a small mortality after operation. Yet in a catastrophe fraught with such tragic possibilities it is difficult to predict the exact course of events, and I have lost cases operated on within 6 hours. Nevertheless, as long ago as 1929, with my then assistant, Mr. Norman Hodgson, we had operated on a consecutive batch of 58 cases up to 6 hours after perforation without a death. In the same series there were 144 cases in the 12-hour period with a mortality just under 7 %; and taking all the cases irrespective of the number of hours after perforation there were 209 with a mortality of not quite 15½ %. These figures—and more recent ones are doubtless much better—show that surgeons may expect to deal by operation with large numbers of early perforations with a minimal mortality. It will probably only be in this same group that the problem of treatment without operation arises, so that this plan has a high standard of recovery with which to compete.

But to get the best results the operation must be as simple as possible, "as you cook little fish without much busyness" (Laotze). In the actual management of the operative treatment there are many points worthy of note. I never liked to operate on patients straight off the street, as it were, and an hour or perhaps two spent in preparation is well worth while. Once the decision to operate has been made some relaxing sedative should be given, and for this purpose morphine is the best. In the few cases where the patient feels sick or when a meal has been taken shortly before the calamity it is wise to pass a stomach tube, not for washing out the viscus but for decompression. Unless this can be done easily it should not be persevered with. The morphine helps to overcome rigidity, but in the rare cases where it fails the use of curare during anæsthesia may be successful. General anæsthesia undoubtedly contributes to the unhurried haste with which the operation can be carried out, and in these days it is interesting to recall that when it was my lot to deal with a large amount of emergency work the anæsthesia was of the simplest. We had no special anæsthetists for emergency work and no machines more complicated than the Clover inhaler. Chloroform on lint or open ether on gauze or the Clover fulfilled our needs.

A midline or transrectus incision, big enough not to impede the necessary manipulations for exposing the perforation and to do away with the use of retractors, is essential. The next step is to find the perforation and make it as accessible as possible for suturing. Extravasation, exudate, and loose lymph are mopped away from the vicinity only and the perforation is closed. With regard to the latter step there are sufficient expedients to deal with any combination of circumstances. In most cases up to 6 or even 8 or 10 hours' drainage is not necessary. If there is real need for special haste the parietal incision may safely be closed with through-and-through sutures of strong silkworm or silk (no. 5, Chinese twist).

In these emergencies the simplest life-saving operation, if carried out before peritonitis is established, is so often rewarded by recovery, even in the presence of adverse conditions, that I am apprehensive of any other method that may countenance delay and demand long and anxious supervision. During my not inconsiderable surgical experience—I operated on my first ruptured duodenal ulcer 43 years ago—I have noticed that when some plan other than operation is advocated for acute abdominal conditions it is often seized upon by the profession, and nearly always with a consequent wave of increased mortality or a recovery-rate clouded by much avoidable anxiety. This has certainly been so with regard to appendicitis.

My mind goes back to the days when recovery after ruptured ulcer was a rare event, and now that early surgical intervention yields such great rewards it seems a pity to lightly turn away from the path. It is important that we should learn the real comparative value of the conservative method, but no-one should try the plan unless they are prepared to carry it out thoroughly and conscientiously in all its details. It would really be better if the trial could be left in the hands of a few.

In the meantime do not let us broadcast the conservative method as though a well-established surgical procedure like early operation was already outdated.

Taplow, Bucks. G. GREY TURNER.

SIR ALMROTH WRIGHT AND ANTI-TYPHOID INOCULATION

SIR,—Dr. Douglas Guthrie appears, by his letter of Oct. 19, to give a somewhat grudging assent to the contention that Wright was the originator of anti-typhoid inoculation. Any lingering doubt that remains may be resolved by reference to an article "An investigation upon the blood changes following anti-typhoid inoculation" (Leishman, Harrison, Smallman, and Tulloch) which appeared in the *Journal of Hygiene* (1905, 5, 380). In the introductory paragraphs of that article it is made quite clear that the pioneer work in this field was done by Wright when professor of pathology at the Army Medical School, Netley. While the investigation described in the article was the first systematic one of a long series that led to the adoption of the practice in the British Army with results, in two world wars, that are well known, it was preceded, as shown in the bibliography, by a series of related observations, dating from 1897 onwards, in which Wright was clearly the leading figure.

As the last surviving member of the group which made the investigation referred to above, mere justice to m former colleagues requires that mention be made of the full acknowledgment of the part played by Wright an of the inspiration so characteristic of his work an teaching.

Guildford. A. B. SMALLMAN.

PSYCHONEUROSIS TREATED WITH ELECTRICA CONVULSIONS

SIR,—Dr. W. L. Milligan's article in your issue Oct. 12 requires comment because it gives a wron impression about the relation of psychotherapy electrical-convulsion therapy.

In these days it has become customary to insert articles on the subject a note of caution about the use electrical convulsions and to add a remark about psych therapy somewhere in the discussion; Dr. Milligan is n exception. He employs electrical convulsions for patien that are resistant to "psychotherapeutic measures," an concludes in his summary: "Electro-convulsive therap should not be used indiscriminately; the greatest ca should be taken in selecting cases." But we are give little indication—indeed only the vaguest hints—abou how to select cases; and his case-reports are not helpfu in this respect, because all serious assessment of th personality is lacking.

As I read the article, taking the argument at its fac value, I could not see any reason for Dr. Milligan' caution. There are no ill effects of a serious nature 97 % of the results are favourable and 3 % "no improved." We do not even hear that the 3 % are wors Such evidence does not justify caution, and I am at a los to understand why he expresses these apparentl meaningless sentiments.

The truth of the matter is that once you are prepare to disregard all our knowledge of the nature and structur of the neuroses in relation to the personality as a whol (and Dr. Milligan's paper does this) there is no limit what can be done with neurotic cases. If Dr. Milligan really prepared to disregard our knowledge of psycho pathology, let him say so and let us not have vague tal about cases resistant to "psychotherapeutic measures." To be more specific, which or how many, and in wha combination, does he use the following in his "psycho therapeutic measures": psychological explanations reassurance, re-education, simple suggestion, suggestio under hypnosis, hypnoanalysis, psychoanalysis? Ha he used the methods of indivi alytical psychology, and what about group-therapy, c.?

As it stands, he is like a man who says: "I have tried edicine (without however specifying what kind of edicine), and since that does not work we will try this rgical method" (which he describes accurately). It is uch the same when he uses the word "resistant." If here is a resistance we must know what the patient is esisting: otherwise there is no sense in the word.

For those of us who hold that many neuroses are bortive attempts to cure a diseased mind, Dr. Milligan's esults cannot be assessed. His caution is justified but ot on the grounds of his evidence.

London, N.W.1. MICHAEL FORDHAM.

SIR,—As a consulting physician I have been responsible or referring many patients to Dr. Beaton at St. James ospital, from both private and hospital practice. I ave also been privileged to see some of Dr. Milligan's ases before, during, and after treatment. I can confirm he claims made in his article of Oct. 12. I have yet to ee the mental deterioration or the persistence of the nitial memory defect which have been feared. I am atisfied that it is a most notable advance in helping the sychoneurotic patient.

All new methods should be subjected to the most earching examination and criticism, but this should ot be captious. In these times much routine description must be omitted from articles through lack of space. If Dr. Tooley (Oct. 26) knows the mental-hospital world at all he must realise that in an institution with the reputation of St. James Hospital, Portsmouth, no patient lacks an "adequate examination."

The aim of treatment with the psychoneurotic patient is surely the removal of symptoms. This was achieved in over 90% of cases. The only question is whether the symptoms will stay "removed."

I have read and re-read Dr. Norman Glaister's discursive letter (Oct. 26) and am still unable to grasp its point. He writes disparagingly of five minutes' psychotherapy, yet Dr. Milligan expressly stresses the necessity of adequate psychotherapy in the resynthesis of the personality following treatment.

Southsea. J. C. PRESTWICH.

RUBBER GLOVES

SIR,—I am writing to you hoping that a little publicity may produce some rubber gloves. For the last eight weeks I have been unable to obtain any, and so have had to attend confinements and to operate with bare hands. Fortunately no-one has yet died from septicæmia.

My would-be suppliers inform me that were it rubber contraceptives that I wanted they could supply me by the gross. No doubt the old adage holds good that "prevention is better than cure."

Hove. F. E. GRAHAM-BONNALIE.

TESTIMONIALS

SIR,—The remarks of your peripatetic correspondent of Oct. 26 will interest the many who are trying to find employment in these hard times, and must raise serious *doubts* as to the value of testimonials in securing an appointment.

It is said that a good testimonial will get a man on the short list, and thereafter the final choice depends, inter alia, on the result of the interview. It would be interesting to have the opinion of those qualified to judge on this matter. There is no doubt that the specifically addressed testimonial, or better the personal letter, carries weight in the deserving case, but today the average candidate cannot afford to stand or fall on the result of one application. The result is the open testimonial, which has all the defects of open diplomacy. I have long disliked this document and the asking for it, so reminiscent of the Indian servant wanting his "chit"; since my return to civil life I have neither sought nor submitted a testimonial and am convinced that my progress has not been impeded thereby. I suggest that the submission of a list of names for reference should be more generally adopted since it gives selection committees a better idea of the true worth of a candidate.

Sheffield. LOUIS A. IVES.

G.B. AND N.B.

SIR,—As a not very perfervid Scot I am occasionally annoyed by the misuse of the word England when Britain is meant. However, according to your report (Oct. 26, p. 626), Sir Henry Bashford uses the word Britain for England when he claims that the London Hospital is the largest voluntary hospital in Britain. It seems to me that there is no great merit in mere size, but this claim cannot be sustained. According to the *Hospitals Year Book* for 1943–44 (the last available) the bed complements are: Edinburgh Royal Infirmary 1287, Glasgow Royal Infirmary 980, London Hospital 891.

A. A. MACIVER
Royal Infirmary, Glasgow. Secretary.

*** We are glad of the correction. Sir Henry joins us in apology.—ED. L.

THIOUREA DERIVATIVES IN THYROTOXICOSIS

SIR,—A note in your issue of Sept. 7 (p. 368) says that there appear to be no published reports of agranulocytosis in patients treated with methyl thiouracil. This is not correct. Kristiansen (*Ugeskr. Læg.* 1945, 107, 255), Leschley Jacobsen (*Ibid*, p. 721), and Ehlertsen (*Ibid*, 1946, 108, 192) have each published a case with recovery, and Lundbæk has published a fatal case (*Ibid*, 1945, 107, 253). Ehlertsen, who made a tentative comparison of the side-effects of thiouracil and methyl thiouracil (and thiourea), saw no conclusive difference between the two first-named.

Aarhus, Denmark. C. HOLTEN.

Public Health

The Third Quarter

DURING the September quarter of this year 213,135 live births were registered, representing a birth-rate of 19·7, the highest recorded in any quarter since June, 1923. This maintains the upward tendency shown in the June quarter, when the number of births registered was 203,797.

The births and deaths registered during the September quarter, with figures for the corresponding quarters of 1945 and 1938, are as follows:

	Live births		Stillbirths		Deaths, including non-civilians	
	Number	Per 1000 popn.	Number	Per 1000 popn.	Number	Per 1000 popn.
Third quarter, 1946	213,135	19·7	5778	0·53	100,363	9·3
" " 1945	167,807	15·6	4676	0·44	97,159	9·0
" " 1938	158,082	15 2	6072	0·58	102,545	9·9

The birth-rate of 19·7 is 4·1 above that for the third quarter of 1945, and 4·5 above that for the corresponding quarter of 1938, the last complete pre-war year. The average for the September quarters of the years 1940–44 was 15·4.

Infectious Disease in England and Wales

WEEK ENDED OCT. 26

Notifications.—Smallpox, 0; scarlet fever, 1209; whooping-cough, 1499; diphtheria, 314; paratyphoid, 89 (71 at Sheffield); typhoid, 9; measles (excluding rubella), 2884; pneumonia (primary or influenzal), 436; cerebrospinal fever, 28; poliomyelitis, 31; polioencephalitis, 2; encephalitis lethargica, 1; dysentery, 59; puerperal pyrexia, 160; ophthalmia neonatorum 68. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Oct. 23 was 878. During the previous week the following cases were admitted: scarlet fever, 56; diphtheria, 21; measles, 17; whooping-cough, 43.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (1) from enteric fever, 2 (0) from measles, 4 (0) from whooping-cough, 3 (0) from diphtheria, 36 (4) from diarrhœa and enteritis under two years, and 13 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 265 (corresponding to a rate of 29 per thousand total births), including 26 in London.

Parliament

NATIONAL HEALTH SERVICE BILL

Third Reading in the Lords

ON Oct. 31 the LORD CHANCELLOR, in moving the third reading, regretted that the Government had not found it possible to frame an amendment to meet the wishes of Viscount Cecil of Chelwood in regard to the treatment of deafness. The noble Viscount had wanted a provision inserted after clause 41 which dealt with supplementary services. This matter of the ear, however, Lord Jowitt pointed out, was not like that of the eye, for anyone who wanted spectacles could go to an ophthalmic optician, but if he had anything the matter with his ears he should go to a properly qualified doctor. If ears could not come as a supplementary service they should come as part of the general hospital service under clause 3, where the Minister was under a duty to provide for "medical, nursing, and other services required at or for the purposes of hospitals," and "the services of specialists, whether at a hospital, a health centre . . . or a clinic." If he were to put in particularly deafness then he was sure that Lord Horder would want to put in rheumatism, and others of their Lordships would want to put in other things until they had set out a whole chain and achieved nothing. After consulting the Minister, Lord Jowitt repeated the definite assurance that a comprehensive service would include provision for deafness. By that he meant not merely the trained assistants that would be required, but also the provision of instruments to alleviate deafness. He would take up with the President of the Board of Trade the question of the production and price of deaf-aids. He regarded it as most important that such instruments should be produced in as large numbers as possible at the earliest possible date, and that they should be available to the public free of charge.

THE AMENDMENTS

Turning to the amendments which had been accepted by the Government, Lord Jowitt said he hoped their Lordships would not take these as showing any weakening or lack of resolution or courage. On the contrary, he thought that the Minister had shown good sense and judgment in meeting the wishes of the House. The main part of the alterations had the effect of writing into the Bill undertakings given by the Minister. One illustration was the amendment dealing with the denominational hospitals, and he could give the assurance that the administration of the matter by the Minister would be in no niggardly or reluctant spirit. He was also glad that the Government had been able to hit upon a method of dealing with endowments which met the general wishes of the House. It did not interfere with the general principle that endowments were to be devoted to all hospitals, but it protected specific endowments intended for particular purposes. He thought it was also a good thing that the powers of the hospital management committee should have been set out in the way they now appeared in the Bill. He might be right or wrong, but personally he took the view that the position in regard to the discovery of documents had already been safeguarded.

Only one alteration of real substance had been made, that affecting the time between the appointed day and the passing of the Act, which might be as long as 18 months. The Minister had already arranged that after the appointed day endowments given to a particular hospital should not be taken away from that institution. That principle had now been extended to the interval of time directly after the Bill became an Act.

TWO BLEMISHES

Lord Jowitt confessed that he thought the Bill had two blemishes. Their Lordships, in his view, were wrong in saying that no part of a doctor's remuneration should be by way of salary. From his experience as Minister of National Insurance he realised that the success or failure of all these schemes depended largely on satisfactory certification. If there was lax or, still more, dishonest certification all these schemes would break on that rock. He had a profound regard for the medical profession, and for their standard of honour, but he had come across cases, not many, where there were two competing doctors, one strict and the other lax in the certification. The people on the panel of the strict doctor were inclined to leave him and go to the other doctor who was lax, not because the latter was a better doctor but because they could more easily get certificates. If the per capita payment had been abolished altogether, and there had been a straight out-and-out salary, the temptation would have gone. But he did not for a moment suggest that, because it would have brought in other troubles and would not have been practical politics. But to have given something in the way of salary would have been valuable, and he honestly believed that their Lordships had made a great mistake. The other blemish was the special *treatment* of London. It was a great pity that health services should be split between two authorities. For the rest, Lord Jowitt claimed that the Government had preserved the absolute right of choice of doctor. They were not going to force anybody to take a doctor he did not like. Nor was it their intention, as some nurses feared, to move people about in the regions. Anyone who had a contract to serve in a particular place could only be called on to serve there. Under this new health scheme there would still be great scope for voluntary service and he hoped that the passing of the Bill would not prevent such service from being forthcoming.

SOME IMPROVEMENTS

Lord LLEWELLIN thought that in their six days' work their Lordships had improved the Bill. One important change was that it had been made certain that a doctor—whether acting in an honorary capacity or not—who served on the staff of one hospital might get his patient admitted, or might even treat him in another hospital. Although Lord Llewellin agreed that there should be a large hospital unit he hoped that the smaller hospitals in the country towns would not be closed, because they still had a useful function in attending to minor ailments which did not require the special treatment of the larger regional hospitals.

The amendments in regard to endowments would, he thought, allow of continuity of voluntary gifts, and maintain the continuity of memory when a gift was made for a specific purpose. The words "control and manage" now inserted into the Bill gave the hospital management committees a better function, and it was, Lord Llewellin held, important that these bodies should not represent mere titles but should have *obvious* powers. He hoped the amendment making these committees capable of suing and of being sued would become part of the Bill. He was also grateful for the assurances given that doctors would have adequate notice of the conditions of service before the appointed day, and that in a proper case a relative should be given a reasonable chance of succeeding to a practice.

There was, he felt, much to be said for the Minister having the last word whether a doctor should continue in the service. But he thought the Bill had been improved by strengthening the doctor's rights before the tribunals.

THE CAPITATION FEE

His amendment in regard to the doctor's remuneration, Lord Llewellin pointed out, left exceptional cases to be dealt with by salary and capitation fee. It had never yet been stated what, in the new service, would be the normal proportion between salary and capitation

If the Government did not see their way to accept e Lords' amendment they should say what proportion ey had in mind. There were obvious things to be said gainst the capitation fee if it meant doctors taking on ore patients than they could properly handle, or getting atients because they were slightly lax in giving certificates. But by and large it was undesirable to take away rom doctors the sense of energy and hard work, and art of that depended upon their being able to attract atients by giving good service.

The Marquess of **Reading** agreed with the Lord hancellor in thinking that the amendment establishing ayment for doctors purely by capitation fees was a lemish on the measure. He hoped that method of payment would not be eventually embodied in the Bill.

Lord **Balfour of Burleigh** said it would be a tribute to the good sense and judgment of the Minister if he saw fit to accept the amendment inserted in the Bill in regard to the London boroughs and their health services. The two major objectives of the amendment were to maintain the high quality of the maternity and child-welfare services in the boroughs, and to cease the process of undermining the quality of local government in the whole of the metropolitan boroughs. Both would be in serious danger if that amendment was not allowed to remain in the Bill. If the services were transferred to the L.C.C. the personal touch would be lost.

The Bill was read the third time with the amendments, passed, and returned to the Commons.

The Lords' Amendments in the Commons

On Nov. 4 the House of Commons met to consider the amendments made to the National Health Service Bill in the House of Lords.

FUNCTIONS OF THE METROPOLITAN BOROUGHS

In moving that "this House doth disagree with the Lords" in the amendment permitting the transfer of some health services from the London County Council to the metropolitan boroughs, Mr. C. S. **Key** pointed out that it destroyed the coördination of the personal health services in London. The amendment would make a serious break in child-welfare work; for the care of the over-fives and of the under-fives in the nursery schools would go to the L.C.C., while the care of the under-fives at the day nurseries would be under the borough council. Prenatal and postnatal services would come under the boroughs, but it would be the L.C.C.'s responsibility to provide the midwives and maternity nurses. Again the borough councils would have to provide home nursing and domestic help in cases of illness, but preventive and aftercare services would still be dealt with by the L.C.C. The amendment gave the borough councils power to maintain maternity and child-welfare centres, but left with the L.C.C. the development of the health centres. The Bill aimed at setting up common health centres where there could be common knowledge among the people serving of each particular case. The unified service set up by the Bill would mean that a service of common standards would be provided for all areas in London irrespective of their poverty or wealth, whereas the amendment laid down that half of the cost of the services was to be provided by the borough council. As a Londoner he was proud to ask the House in the interests of London to disagree with the Lords in their amendment.

Mr. R. **Law** argued that the principles of absolute uniformity did not run all through the Bill itself. Expectant mothers and health centres, for example, both came under several authorities. If there was anything in this argument it was that the whole Bill and not this amendment by itself was unworkable.

Mr. **Somerville Hastings** thought the amendment would at least have been intelligible if it transferred all the health functions to the borough councils. As it was it would merely increase the number of health authorities in London from three to four. Under the Bill the L.C.C. was to be the authority for health centres, and he was sure it was the Minister's intention to associate all the doctors in the new service with the prevention of disease. One way was to get them to work in health centres where the preventive services were being carried out in closest contact with health visitors, maternity and child-welfare clinics, and home nursing services. Yet the amendment wanted to put these services under the borough councils which would have nothing to do with the health centres, and would indeed have power to provide separate premises for their services. The amendment would thus separate more than was necessary the preventive and curative sides of the treatment of disease.

Mr. **Bevan** described the discussion which followed as a fairly long one during which nothing new was heard. He pointed out that the amendment would give rise to as many anomalies as it sought to correct, for the anomalies were inherent in our local-government structure. Harrow, for example, had a population of 211,000, but the withers of the Opposition remained unwrung, though they were speechless with indignation about Holborn with a population of 22,000. He agreed that the accessibility of the local authority to the population was of the utmost importance, but in future the citizen who was in difficulty about his health would go to the health centre and not to the town hall. At the centre he could have all his wants attended to in the same place by the same organisation. These schemes had been carefully integrated and Mr. Bevan felt bound to pray of the House not to make a radical alteration at that stage.

The amendment was negatived by 296 votes to 134.

BASIC SALARY

Mr. **Bevan** resisted the Lords' amendment that the remuneration of general practitioners under the new scheme should normally be by capitation fee. He had heard arguments for and against the basic salary but he had never yet heard an argument why it should be put in the Bill. It was not desirable for future negotiations with the medical profession to start with a statutory inhibition. He therefore seriously suggested to Members in all parts of the House that whatever their views about having a basic element in the remuneration they should not insist upon its going into the Bill but should leave it open.

He was not seeking to escape a discussion of the main issue, but he wished to face it forthrightly. By the abolition of the sale of practices the young doctor had been delivered from the hands of the moneylenders, but he had not been provided with a positive means of livelihood. It was therefore the Government's intention that while the young general practitioner was building up his list he should have the security of a salary. He could not accept the view that a doctor examined his patients any better if his heart was gnawed with financial anxiety. A basic salary would reduce competition for patients, and the build-up of panel lists had not always been done by methods which commended themselves to the best elements of the medical profession. Another reason in favour of a basic salary was that the remuneration of a doctor should contain an element to which inducements for special training and qualifications could be added. It had been suggested that they could add to the capitation fee, but that would be very untidy and almost impossible.

Some doctors feared that this was the beginning of a full-time salaried service. Mr. Bevan said he could not read into the mind of any future Minister, but that was not his own intention. The Government intended that the main source of a doctor's remuneration should be by *capitation*, and for excellent reasons. There was an argument for having a full-time salaried service; *there* was an argument for having full capitation; but there was no argument for having a high basic salary

Parliament

NATIONAL HEALTH SERVICE BILL

Third Reading in the Lords

ON Oct. 31 the LORD CHANCELLOR, in moving the third reading, regretted that the Government had not found it possible to frame an amendment to meet the wishes of Viscount Cecil of Chelwood in regard to the treatment of deafness. The noble Viscount had wanted a provision inserted after clause 41 which dealt with supplementary services. This matter of the ear, however, Lord Jowitt pointed out, was not like that of the eye, for anyone who wanted spectacles could go to an ophthalmic optician, but if he had anything the matter with his ears he should go to a properly qualified doctor. If ears could not come as a supplementary service they should come as part of the general hospital service under clause 3, where the Minister was under a duty to provide for "medical, nursing, and other services required at or for the purposes of hospitals," and "the services of specialists, whether at a hospital, a health centre . . . or a clinic." If he were to put in particularly deafness then he was sure that Lord Horder would want to put in rheumatism, and others of their Lordships would want to put in other things until they had set out a whole chain and achieved nothing. After consulting the Minister, Lord Jowitt repeated the definite assurance that a comprehensive service would include provision for deafness. By that he meant not merely the trained assistants that would be required, but also the provision of instruments to alleviate deafness. He would take up with the President of the Board of Trade the question of the production and price of deaf-aids. He regarded it as most important that such instruments should be produced in as large numbers as possible at the earliest possible date, and that they should be available to the public free of charge.

THE AMENDMENTS

Turning to the amendments which had been accepted by the Government, Lord Jowitt said he hoped their Lordships would not take these as showing any weakening or lack of resolution or courage. On the contrary, he thought that the Minister had shown good sense and judgment in meeting the wishes of the House. The main part of the alterations had the effect of writing into the Bill undertakings given by the Minister. One illustration was the amendment dealing with the denominational hospitals, and he could give the assurance that the administration of the matter by the Minister would be in no niggardly or reluctant spirit. He was also glad that the Government had been able to hit upon a method of dealing with endowments which met the general wishes of the House. It did not interfere with the general principle that endowments were to be devoted to all hospitals, but it protected specific endowments intended for particular purposes. He thought it was also a good thing that the powers of the hospital management committee should have been set out in the way they now appeared in the Bill. He might be right or wrong, but personally he took the view that the position in regard to the discovery of documents had already been safeguarded.

Only one alteration of real substance had been made, that affecting the time between the appointed day and the passing of the Act, which might be as long as 18 months. The Minister had already arranged that after the appointed day endowments given to a particular hospital should not be taken away from that institution. That principle had now been extended to the interval of time directly after the Bill became an Act.

TWO BLEMISHES

Lord Jowitt confessed that he thought the Bill had two blemishes. Their Lordships, in his view, were wrong in saying that no part of a doctor's remuneration be by way of salary. From his experience as of National Insurance he realised that the succe failure of all these schemes depended largely on sa factory certification. If there was lax or, still mo dishonest certification all these schemes would bre on that rock. He had a profound regard for the medi profession, and for their standard of honour, but he h come across cases, not many, where there were t competing doctors, one strict and the other lax in th certification. The people on the panel of the strict doct were inclined to leave him and go to the other doct who was lax, not because the latter was a better doct but because they could more easily get certificate If the per capita payment had been abolished altogethe and there had been a straight out-and-out salary, th temptation would have gone. But he did *not for a moment* suggest that, because it would have brought in other troubles and would not have been practical politics. But to have given something in the way of salary would have been valuable, and he honestly believed that their Lordships had made a great mistake. The other blemish was the special treatment of London. It was a great pity that health services should be split between two authorities. For the rest, Lord Jowitt claimed that the Government had preserved the absolute right of choice of doctor. They were not going to force anybody to take a doctor he did not like. Nor was it their intention, as some nurses feared, to move people about in the regions. Anyone who had a contract to serve in a particular place could only be called on to serve there. Under this new health scheme there would still be great scope for voluntary servic and he hoped that the passing of the Bill would no prevent such service from being forthcoming.

SOME IMPROVEMENTS

Lord LLEWELLIN thought that in their six days' work their Lordships had improved the Bill. On important change was that it had been made certain that a doctor—whether acting in an honorary capacity or not—who served on the staff of one hospital might get his patient admitted, or might even treat him in another hospital. Although Lord Llewellin agreed that there should be a large hospital unit he hoped that the smaller hospitals in the country towns would not be closed, because they still had a useful function in attending to minor ailments which did not require the special treatment of the larger regional hospitals.

The amendments in regard to endowments would, he thought, allow of continuity of voluntary gifts, an maintain the continuity of memory when a gift was mad for a specific purpose. The words "control and manage now inserted into the Bill gave the hospital management committees a better function, and it was, Lor Llewellin held, important that these bodies should no represent mere titles but should have obvious powers He hoped the amendment making these committee capable of suing and of being sued would become pa of the Bill. He was also grateful for the assurance given that doctors would have adequate notice of th conditions of service before the appointed day, and tha in a proper case a relative should be given a reasonabl chance of succeeding to a practice.

There was, he felt, much to be said for the Ministe having the last word whether a doctor should continu in the service. But he thought the Bill had been improve by strengthening the doctor's rights before the tribunals

THE CAPITATION FEE

His amendment in regard to the doctor's remuneration, Lord Llewellin pointed out, left exceptional case to be dealt with by salary and capitation fee. It had never yet been stated what, in the new service, would be the normal proportion between salary and capitation

If the Government did not see their way to accept Lords' amendment they should say what proportion ey had in mind. There were obvious things to be said ainst the capitation fee if it meant doctors taking on ore patients than they could properly handle, or getting atients because they were slightly lax in giving certifi- ates. But by and large it was undesirable to take away om doctors the sense of energy and hard work, and art of that depended upon their being able to attract atients by giving good service.

The Marquess of **Reading** agreed with the Lord hancellor in thinking that the amendment establishing ayment for doctors purely by capitation fees was a lemish on the measure. He hoped that method of ayment would not be eventually embodied in the Bill.

Lord **Balfour of Burleigh** said it would be a tribute o the good sense and judgment of the Minister if he saw it to accept the amendment inserted in the Bill in regard o the London boroughs and their health services. The wo major objectives of the amendment were to maintain he high quality of the maternity and child-welfare ervices in the boroughs, and to cease the process of ndermining the quality of local government in the whole of the metropolitan boroughs. Both would be in serious langer if that amendment was not allowed to remain in the Bill. If the services were transferred to the L.C.C. the personal touch would be lost.

The Bill was read the third time with the amendments, passed, and returned to the Commons.

The Lords' Amendments in the Commons

On Nov. 4 the House of Commons met to consider the amendments made to the National Health Service Bill in the House of Lords.

FUNCTIONS OF THE METROPOLITAN BOROUGHS

In moving that "this House doth disagree with the Lords" in the amendment permitting the transfer of some health services from the London County Council to the metropolitan boroughs, Mr. C. S. **Key** pointed out that it destroyed the coördination of the personal health services in London. The amendment would make a serious break in child-welfare work; for the care of the over-fives and of the under-fives in the nursery schools would go to the L.C.C., while the care of the under-fives at the day nurseries would be under the borough council. Prenatal and postnatal services would come under the boroughs, but it would be the L.C.C.'s responsibility to provide the midwives and maternity nurses. Again the borough councils would have to provide home nursing and domestic help in cases of illness, but preventive and aftercare services would still be dealt with by the L.C.C. The amendment gave the borough councils power to maintain maternity and child-welfare centres, but left with the L.C.C. the development of the health centres. The Bill aimed at setting up common health centres where there could be common knowledge among the people serving of each particular case. The unified service set up by the Bill would mean that a service of common standards would be provided for all areas in London irrespective of their poverty or wealth, whereas the amendment laid down that half of the cost of the services was to be provided by the borough council. As a Londoner he was proud to ask the House in the interests of London to disagree with the Lords in their amendment.

Mr. R. **Law** argued that the principles of absolute uniformity did not run all through the Bill itself. Expectant mothers and health centres, for example, both came under several authorities. If there was anything in this argument it was that the whole Bill and not this amendment by itself was unworkable. Mr. **Somerville Hastings** thought the amendment would at least have been intelligible if it transferred all the health functions to the borough councils. As it was it would merely increase the number of health authorities in London from three to four. Under the Bill the L.C.C. was to be the authority for health centres, and he was sure it was the Minister's intention to associate all the doctors in the new service with the prevention of disease. One way was to get them to work in health centres where the preventive services were being carried out in closest contact with health visitors, maternity and child-welfare clinics, and home nursing services. Yet the amendment wanted to put these services under the borough councils which would have nothing to do with the health centres, and would indeed have power to provide separate premises for their services. The amendment would thus separate more than was necessary the preventive and curative sides of the treatment of disease.

Mr. **Bevan** described the discussion which followed as a fairly long one during which nothing new was heard. He pointed out that the amendment would give rise to as many anomalies as it sought to correct, for the anomalies were inherent in our local-government structure. Harrow, for example, had a population of 211,000, but the withers of the Opposition remained unwrung, though they were speechless with indignation about Holborn with a population of 22,000. He agreed that the accessibility of the local authority to the population was of the utmost importance, but in future the citizen who was in difficulty about his health would go to the health centre and not to the town hall. At the centre he could have all his wants attended to in the same place by the same organisation. These schemes had been carefully integrated and Mr. Bevan felt bound to pray of the House not to make a radical alteration at that stage.

The amendment was negatived by 296 votes to 134.

BASIC SALARY

Mr. **Bevan** resisted the Lords' amendment that the remuneration of general practitioners under the new scheme should normally be by capitation fee. He had heard arguments for and against the basic salary but he had never yet heard an argument why it should be put in the Bill. It was not desirable for future negotiations with the medical profession to start with a statutory inhibition. He therefore seriously suggested to Members in all parts of the House that whatever their views about having a basic element in the remuneration they should not insist upon its going into the Bill but should leave it open.

He was not seeking to escape a discussion of the main issue, but he wished to face it forthrightly. By the abolition of the sale of practices the young doctor had been delivered from the hands of the moneylenders, but he had not been provided with a positive means of livelihood. It was therefore the Government's intention that while the young general practitioner was building up his list he should have the security of a salary. He could not accept the view that a doctor examined his patients any better if his heart was gnawed with financial anxiety. A basic salary would reduce competition for patients, and the build-up of panel lists had not always been done by methods which commended themselves to the best elements of the medical profession. Another reason in favour of a basic salary was that the remuneration of a doctor should contain an element to which inducements for special training and qualifications could be added. It had been suggested that they could add to the capitation fee, but that would be very untidy and almost impossible.

Some doctors feared that this was the beginning of a full-time salaried service. Mr. Bevan said he could not read into the mind of any future Minister, but that was not his own intention. The Government intended that the main source of a doctor's remuneration should be by capitation, and for excellent reasons. There was an argument for having a full-time salaried service; there was an argument for having full capitation; but there was no argument for having a high basic salary

Parliament

NATIONAL HEALTH SERVICE BILL

Third Reading in the Lords

On Oct. 31 the **Lord Chancellor**, in moving the third reading, regretted that the Government had not found it possible to frame an amendment to meet the wishes of Viscount Cecil of Chelwood in regard to the treatment of deafness. The noble Viscount had wanted a provision inserted after clause 41 which dealt with supplementary services. This matter of the ear, however, Lord Jowitt pointed out, was not like that of the eye, for anyone who wanted spectacles could go to an ophthalmic optician, but if he had anything the matter with his ears he should go to a properly qualified doctor. If ears could not come as a supplementary service they should come as part of the general hospital service under clause 3, where the Minister was under a duty to provide for "medical, nursing, and other services required at or for the purposes of hospitals," and "the services of specialists, whether at a hospital, a health centre . . . or a clinic." If he were to put in particularly deafness then he was sure that Lord Horder would want to put in rheumatism, and others of their Lordships would want to put in other things until they had set out a whole chain and achieved nothing. After consulting the Minister, Lord Jowitt repeated the definite assurance that a comprehensive service would include provision for deafness. By that he meant *not merely the trained assistants that would be required*, but also the provision of instruments to alleviate deafness. He would take up with the President of the Board of Trade the question of the production and price of deaf-aids. He regarded it as most important that such instruments should be produced in as large numbers as possible at the earliest possible date, and that they should be available to the public free of charge.

THE AMENDMENTS

Turning to the amendments which had been accepted by the Government, Lord Jowitt said he hoped their Lordships would not take these as showing any weakening or lack of resolution or courage. On the contrary, he thought that the Minister had shown good sense and judgment in meeting the wishes of the House. The main part of the alterations had the effect of writing into the Bill undertakings given by the Minister. One illustration was the amendment dealing with the denominational hospitals, and he could give the assurance that the administration of the matter by the Minister would be in no niggardly or reluctant spirit. He was also glad that the Government had been able to hit upon a method of dealing with endowments which met the general wishes of the House. It did not interfere with the general principle that endowments were to be devoted to all hospitals, but it protected specific endowments intended *for particular purposes*. He thought it was also a good thing that the powers of the hospital management committee should have been set out in the way they now appeared in the Bill. He might be right or wrong, but personally he took the view *that* the position in regard to the discovery of documents had already been safeguarded.

Only one alteration of real substance had been made, that affecting the time between the appointed day and the passing of the Act, which might be as long as 18 months. The Minister had already arranged that after the appointed day endowments given *to a particular* hospital should not be taken away from that institution. That principle had now been extended to the interval of time directly after the Bill became an Act.

TWO BLEMISHES

Lord Jowitt confessed that he thought the Bill had two blemishes. Their Lordships, in his view, were wrong in saying that no part of a doctor's remuneration be by way of salary. From his experience as of National Insurance he realised that the succes failure of all these schemes depended largely on sa factory certification. If there was lax or, still m dishonest certification all these schemes would br on that rock. He had a profound regard for the med profession, and for their standard of honour, but he come across cases, not many, where there were competing doctors, one strict and the other lax in th certification. The people on the panel of the strict doct were inclined to leave him and go to the other doct who was lax, not because the latter was a better doc but because they could more easily get certificate If the per capita payment had been abolished altogethe and there had been a straight out-and-out salary, th temptation would have gone. But he did not for moment suggest that, because it would have brough in other troubles and would not have been practica politics. But to have given something in the way o salary would have been valuable, and he honestl believed that their Lordships had made a grea mistake. The other blemish was the special treatmen of London. It was a great pity that health service should be split between two authorities. For the rest Lord Jowitt claimed that the Government had preserve the absolute right of choice of doctor. They were no going to force anybody to take a doctor he did not like Nor was it their intention, as some nurses feared, t *move people about in the regions.* Anyone who had contract to serve in a particular place could only b called on to serve there. Under this new health schem there would still be great scope for voluntary servi and he hoped that the passing of the Bill would n prevent such service from being forthcoming.

SOME IMPROVEMENTS

Lord **Llewellin** thought that in their six day work their Lordships had improved the Bill. O important change was that it had been made certain th a doctor—whether *acting in an* honorary capac or not—who served on the staff of one hospital mig get his patient admitted, or might even treat him i another hospital. Although Lord Llewellin agreed th there should be a large hospital unit he hoped that t smaller hospitals in the country towns would not closed, because they still had a useful function in atten ing to minor ailments which did not require the speci treatment of the larger regional hospitals.

The amendments in regard to endowments would, thought, allow of continuity of voluntary gifts, a maintain the continuity of memory when a *gift* was ma for a specific purpose. The words "control and manage now inserted into the Bill gave the hospital manag ment committees a better function, and it was, Lo Llewellin held, important that these bodies should n *represent mere titles but should have obvious power* He hoped the amendment making these committe capable of suing and of being sued would become pa of the Bill. He was also grateful for the assuranc given that doctors would have adequate notice of t conditions of service before the appointed day, and th in a proper case a relative should be given a reasonal chance of succeeding to a practice.

There was, he felt, much to be said for the Minist having the last word whether a doctor should contin in the service. But he thought the Bill had been improv *by strengthening the doctor's rights* before the tribuna

THE CAPITATION FEE

His amendment in regard to the doctor's remuner tion, Lord Llewellin pointed out, left exceptional cas to be dealt with by salary and capitation fee. It ha never yet been stated what, in the new service, wou be the normal proportion between salary and capitatio ealth Insurance. He suggested that the Minister might ve an undertaking that, if the Spens report showed at the present dental scale was inadequate, retrospective yments would be made from the time of this dispute.

Mr. JAMES GRIFFITHS, Minister of National Insurance, id the system of unequal benefits to insured persons as going, and ought to go. Whatever settlement was ade now could only be temporary pending the introducon of the National Health Service scheme in 1948. the meantime, Mr. Griffiths continued, he and the linister of Health had to decide not what they thought ne dentist ought to have but the scale of fees which he approved societies could meet. If there was not nough money to meet half the cost there could be no ervice. The approved societies had only a limited mount of money for this purpose, and it would cheat he insured people of this country if he as Minister pproved a scale giving the dentists an increase in emuneration which the approved societies could not meet. He claimed that the Government were entitled to take the view that, apart from the fact that the acceptance of the suggested new scale would have meant a breakdown of the system, it involved such a radical departure from the old scale that it would prejudge the very issues which the Spens Committee had been appointed to investigate. It was in the interests of the dentists to rejoin the committee so that it might be able to go on with its work and report quickly. In 18 months the whole of the present system would go, and Mr. Griffiths would be glad to be one who pushed it out. But for the next 18 months he had the responsibility of seeing that the old system carried on, and anything he accepted was of no value unless the approved societies could work it.

QUESTION TIME

Milk Distribution

Sir HENRY MORRIS-JONES asked the Minister of Food what as the total quantity of milk distributed per week to nonriority users and how much to priority users, stating the tal amount for each category; and what was the average mount of milk per person bought, distributed, or consumed re-war.—Mr. JOHN STRACHEY replied: The total weekly uantity of milk distributed to different categories of conmers cannot be precisely stated, but the total quantities uthorised for non-priority users in Great Britain when the tandard weekly allowance is 2 pints per week are approximately 9½ million gallons and for priority users approximately 0½ million gallons. The weekly quantities authorised for the ifferent categories are as follows:

Non-priority	*Gallons*
Registered customers over 18 years	7,390,000
Non-priority establishments—e.g., canteens, restaurants, groups of industrial, business, and clerical workers	2,200,000
	9,500,000
Priority	
Registered customers, under 5 years	2,900,000
" " 5 to 18 years	3,300,000
Expectant mothers	600,000
Mothers of children under 1 year	300,000
Invalids suffering from conditions which qualify for extra milk	1,300,000
Priority establishments—e.g., hospitals, schools, and milk-in-schools scheme	2,100,000
	10,500,000

During September, when the non-priority allowance was 2 pints per week, the total amount of liquid milk actually distributed was 99·06 million gallons, or a weekly average of 23·114 million gallons.

For the years 1937 to 1939 inclusive the average weekly consumption of milk in England and Wales was 3·01 pints per head. For the year October, 1945, to September, 1946, the average consumption was 4·62 pints per head per week.

Approved Societies and Dental Benefit

Sir WILLIAM DARLING asked the Minister of National Insurance the total number of approved societies; the number paying dental benefit; and the total amount of funds hypothecated for dental benefit.—Mr. T. STEELE replied: The total number of approved societies and branches which constitute separate units for valuation purposes is about 6000; about 5000 of these have schemes of additional benefits which include dental benefit. The total annual allocation of funds for the provision of this benefit is approximately £2,400,000.

Obituary

WILFRID FOSTER VIRET

D.S.C., M.R.C.S.

Wilfrid Viret died at Bradford on Oct. 23 after a short illness. The second son of the late Dr. B. P. Viret, of Bradford, he was 36 years of age and was educated at the Bradford Grammar School, Leeds University, and University College Hospital. After qualifying in 1935 he was house-physician at Leeds General Infirmary and then took a short-service commission in the Royal Navy. He spent some years on the China Station, most of them in the river gunboat H.M.S. *Tern*. He saw something of the Sino-Japanese war and on a number of occasions attended civilian casualties after air-raids by the Japanese. Before his five years' term of service came to an end, war broke out in 1939 and he continued to serve in the Navy. In the early part of the war he was surgeon lieutenant in the destroyer H.M.S. *Vesper*, engaged in the Channel patrol; but later he was transferred to the cruiser H.M.S. *Aurora* and spent some years in the Mediterranean theatre of war. In 1941 he was awarded the Distinguished Service Cross for conspicuous bravery and devotion to duty.

On demobilisation last December Viret went into practice at Shipley, in Yorkshire, with his brother and sister-in-law. He bade fair to become the ideal family doctor, and was looking forward to a useful life in the English country to which he was devoted, his plans being divided between the Yorkshire Dales and Somerset. "A sturdy handsome man with a peculiarly deep resonant voice and a lively personality, his tastes were for simple things, good books and conversation, old furniture and glass. But above all he loved his home life, of which he had all too little during his ten years in the Royal Navy. He liked to potter about in a kitchen and cook unusual and tasty meals. His flair for cooking dated from boyhood, and at the age of nine he would cook the meals of his fellow wolf-cubs. His well-filled and alert mind caused him to write a clear and vigorous prose style, his letters from abroad being full of shrewd and witty observations of people, places, and affairs, illustrated often by thumbnail sketches characterised by economy of line."

In 1940 he married Penelope Mary Downes, and he leaves a son and daughter.

STUART McDONALD

M.A., M.D. CAMB., PH.D. BIRM.

Prof. Stuart McDonald, jun., who died on Oct. 24 at the early age of 41, was one of the most brilliant of the younger pathologists.

The only son of Prof. Stuart McDonald, formerly professor of pathology at Durham, he was educated at Fettes and at Caius College, Cambridge, where he graduated B.A. in 1926. He received his clinical training at Edinburgh and Newcastle-upon-Tyne, qualifying in 1930. For the next four years he was demonstrator in pathology at Durham and assistant pathologist to the Royal Victoria Infirmary, Newcastle-upon-Tyne. In 1934 he went to Birmingham as senior lecturer in pathology and assistant pathologist to the General Hospital, and he was later appointed histologist to the Birmingham branch of the British Empire Cancer Campaign. Both at Durham and Birmingham he was actively engaged in research, as is shown by his many publications on a variety of subjects. He graduated M.D. in 1938, and the following year received the degree of PH.D. at Birmingham.

Always interested in military training, McDonald had received a commission in the Territorial Army in 1932, and for a time commanded the medical unit of Durham University S.T.C. In 1936 he was given the mobilisation appointment of deputy assistant director of pathology.

and a small capitation, because the higher the basic element the more it became concealed capitation; for after the lists had reached the point where they absorbed the basic element, it was merely another form of capitation payment. If the basic element was too high they would find it difficult to carry out the recommendations of the Spens report. If the basic salary was too high obviously the capitation-rate would have to be lower, and the higher salaries recommended for successful general practitioners could not be achieved without unduly large lists. The fears of the medical profession were unfounded, and Mr. Bevan reaffirmed that it was not proposed that the basic element should be the main part of the remuneration.

Mr. J. S. C. **Reid** declared that the Minister's calming assurances had no value unless Labour Party policy had been altered in the last three or four months. No-one suggested that there should not be a salary in areas of scattered population or that there could not be a fixed small payment for special qualifications. At present the medical profession were free and independent because the majority of doctors were free and independent. But as soon as the majority received a salary he believed the atmosphere would change. Mr. C. H. **Gage** said that the medical profession had many great things to offer—integrity, high standards, and ideals. But it did not at present offer a sheltered and secure life. In that lay its strength. If the Minister gave it security he might take away something which was far more valuable—its high standards.

Sir **Henry Morris-Jones** thought that if the capitation system was adopted the medical profession would be much more inclined to look favourably at the scheme. The salary basis would reduce the whole thing to a dull level of uniformity and the profession would lose the colour and characteristics which are the foundation of medicine. Dr. S. **Segal** doubted whether insecurity was always an incentive. Some doctors born into this world in a state of security were able to specialise. He hoped the Bill would ensure that other deserving elements of the community would not be deprived of their chance because of lack of security. The necessary corollary of the Minister's stand on the basic salary was that the State should make provision for the best students not only to qualify as doctors but also to have the opportunity of doing postgraduate work and research. He was convinced that in years to come the medical profession would see that it was in their own interests that part of their remuneration should be by basic salary. The amendment was negatived by 303 votes to 128.

The reasons for disagreeing with certain of the Lords' amendments were reported, and it was agreed to communicate them to the Upper House.

FROM THE PRESS GALLERY

Christian Science Nurses

On Oct. 29 in the House of Lords Viscount **Astor** moved to annul the Nurses Amendment Regulation made under the Nurses Act, 1943. A similar motion brought forward by Mr. Alfred Edwards was negatived in the Commons on Oct. 14.[1] Christian Science nurses, Lord Astor explained, were not taught the medical side of nursing, but in general hygiene their training was not dissimilar. Christian Science treatment, he continued, was not illegal; it was recognised by the Public Health Act, 1936. If this regulation was not repealed we should have a law which would be difficult to enforce and which would savour of persecution and intolerance. Were these women to be fined or imprisoned because they used the title laid down in the constitution of their Church? The Christian Scientists, Lord Astor was authorised to say, would not object to any regulation making it illegal for Christian Science nurses to advertise by name-plate, in the Press, or in any general publication. But they asked that they should be permitted to use the Christian Science Nurses in their official publications in the records of their Church.

Lord **Horder** declared this was a matter of p polity. For some time an effort had been made, unsuccessfully, to raise the status of nurses. There now statutory recognition of two types of nurse—"assistant nurse" and the State-registered nurse. T were being asked to recognise another category they were assured would only advertise itself the medium of particular journals. *If they could* an assurance—Lord Horder did not think they that those journals were confined to this pa religious body, there might perhaps be some with Lord Astor's motion. But it was common knowl that the circulation of at least one of those C Science journals was large and universal, and on th ground Lord Horder did not think the safeguard for t nursing profession was adequate. Therefore he hop that the motion would not receive their Lordshi support.

Lord **Llewellin** doubted whether it would be possi to bring home to any British subject who was describ as a Christian Science nurse in a paper published abro that an offence under the Act had been committed.

Viscount **Addison** pointed out that Noble Lor must either approve or disapprove of regulations. Th could not amend them. As to Lord Astor's comprom it did not come into the matter, for we could not contr what was printed in the newspapers of the United States. This was not a religious controversy, he continued. What mattered was to safeguard the interests of the nursing profession. In the view of the Government it was not right that any set of people who were not nurses, whatever their religious convictions, should describe themselves as nurses. People did not refer to Christian Science doctors or Methodist doctors. Doctors had a medical qualification and that was the test of their being entered on the Medical Register, and the same applied to nurses. The motion to annul the regulation was negatived by 55 votes to 11.

Dental Controversy

In the House of Commons on Oct. 25 Mr. **John Baird**, L.D.S., pointed out that dental benefits for insured people were different from medical benefits because the latter were compulsory while the former were paid only by those insurance societies which had surplus profits, and this inadequate method had always been accepted reluctantly by the dentists. During the war the Dental Benefit Council, which had on the whole functioned well, was in abeyance, and negotiations between the profession and the Ministry were carried on by an emergency committee. In 1944 a new scale of fees was agreed on, again reluctantly, by the dentists, and in 1945 uneasiness arose among them and unfortunately, in the South of England especially, many withheld their services from National Health Insurance. As a result, negotiations took place between the Ministry of Health, who were then responsible, and the leaders of the dental profession. The strike was called off and the Minister gave an undertaking that he would reconstitute the Dental Benefit Council and set up the Spens Committee to inquire into their future remuneration.

The present point at issue, Mr. Baird declared, was not chiefly the scale of fees but the method of negotiation between the profession and the Government. A long-established machinery was being turned down, and the Minister was imposing on the profession, without consultation, a scale of fees which was considerably lower than that suggested by the Dental Benefit Council. The Spens Committee could not report before the summer, and if this dispute was allowed to continue until then a running sore would be created which would be difficult to remove. The Government ought to establish negotiating machinery in which both sides could have confidence. Mr. Baird agreed that the aim should be to encourage people to conserve their teeth rather than have them extracted and replaced by dentures, but many people had neglected their teeth, so that extraction and the fitting of dentures would continue for some years, and it was now impossible for a dentist to get a reasonable margin of profit for dentures provided under National

---

[1] *Lancet*, Oct. 26, p. 621.

Shorncliffe Area, but in 1939 he was transferred, with the rank of major, to a Territorial Army hospital which had been formed in Birmingham. He was mobilised in August, 1939, and served as a pathologist in England, France, and India until August, 1943, when he became principal histopathologist to the new central laboratory for India Command, at Poona. In September, 1944, he was promoted to lieut.-colonel on appointment as assistant director of pathology (research) at General Headquarters, India Command, Delhi. In this post he was responsible not only for the initiation and administration of research in clinical pathology throughout India Command; under his charge eight research teams investigated problems concerned with scrub-typhus, amœbic dysentery and other protozoal diseases. penicillin and mepacrine therapy, and other subjects.

In October, 1945, he was inducted into the chair of pathology at St. Andrews University; but a few weeks later he fell ill and was ordered a long rest. Latterly his condition seemed to improve, and there was some prospect of his returning to duty.

Stuart McDonald was an outstanding teacher, with an unusual flair for stimulating the enthusiasm of his students, in whom he took a personal interest, sparing no effort to help them in their difficulties. His published papers and the many communications he made to scientific societies indicated his powers of exposition, and proved him to be a skilled and accurate observer, scrupulously attentive to detail and possessing a wide knowledge of his subject. He applied sound judgment to the interpretation of difficult cases, and his hospital work was much appreciated by his clinical colleagues. He was an enthusiastic angler and shot: he was, too, a good mixer, liked and respected by all who knew him. His sudden and unexpected death came as a great shock to his many friends.

He leaves a widow and two daughters.

SIDNEY DEANER

M.R.C.S.

Dr. Deaner, chief tuberculosis officer for Worcestershire, who died on Oct. 15 at the age of forty-two, qualified at St. Mary's Hospital in 1927. After a few valuable months spent in general practice he held house-appointments at the King Edward Memorial Hospital, Ealing, where he became interested in tuberculosis. He acquired further clinical and administrative experience at the South Wales Sanatorium, at Papworth, and in the Sheffield health department.

In 1932 he went to Worcestershire when the chief tuberculosis officer was Dr. Gordon Smith. Deaner gained his complete confidence and proved the ideal tuberculosis officer—enthusiastic, willing, and sympathetic, with never-failing courtesy, proud to be at the service of the patients and doctors of the county. When Gordon Smith died in 1939 there was no doubt who his successor should be, and Deaner was appointed to the position, which he held until his death. He loved hard work and had the organising ability and imagination necessary for progress; and it was on his advice that the council provided a unit for chest surgery at Knightwick Sanatorium, under the charge of Mr. Holmes Sellors. His popularity as a consultant was understandable. for he displayed the abilities of a general physician as well as those of a specialist in tuberculosis. At the beginning of the war Deaner and the other two county tuberculosis officers all wished to join the Services, but Deaner could not be spared. At once he started to train the central clerical staff in first-aid work, and later as detraining officer at the Worcester railhead he directed a devoted and efficient band of stretcher-bearers who dealt with convoys of Service patients. He took a leading part in reviving the Midland tuberculosis group of the Society of Medical Officers of Health, and became its secretary. He was also secretary of the Worcester and Bromsgrove division of the B.M.A. Three years ago the first symptoms of a fatal disease appeared. but his courage and the love of his work never left him. and in his last months he struggled with Russian grammar in the hopes of becoming a translator of medical books.

"Sidney Deaner," writes a colleague, "was the perfect T.O. He knew the tuberculous families, their homes, their work, and their difficulties; he helped their future. Much of his time was spent in the pensaries, slums, and factories of the Black C Industrial diseases interested him immensely and described silicosis amongst the Stourbridge claym Robust, energetic, and stocky, with a straight back, black curly hair, one recalls him on the terrace Knightwick Sanatorium on the Ankerdine hillside a bundle of tomograms selected for the next of the clinical society. Here, overlooking his fa Teme Valley, he delighted to be, and he was certain have plenty of interesting cases to show to the d sought his help. Happy are the memories he has in Worcestershire."

He leaves a widow and a young son.

Diary of the Week

NOV. 10 TO 16

Monday, 11th

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. E. R. A. Merewether: Field of Research in Indust Health.

Tuesday, 12th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Psychiatry.* Dr. H. Eysenck: Measurement Personality.

CHELSEA CLINICAL SOCIETY
6.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terra S.W.7.) Mr. B. H. Burns, Mr. Charles Read, Dr. Bewley: Backache.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. H. Corsi: Diseases of the Nails.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Mr. Angus Sinclair: Interdepend of Biology and Other Branches of the Higher Learnin

Wednesday, 13th

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Sir Max Page: Uses of Ph therapy in an Accident Service.

MEDICAL SOCIETY OF THE L.C.C. SERVICE
4.30 P.M. (County Hall, Westminster Bridge, S.E.1.) Dr. Alston, Dr. B. Young, Mr. M. Jemson: Penicillin Treatment of Disease.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Por Place, W.1
3.30 P.M. Miss Barbara M. Duncum, D.PH.: Popular Hist Anæsthesia.

Thursday, 14th

UNIVERSITY OF LONDON
5 P.M. (University College, Gower Street, W.C.1.) Sir J Barcroft, F.R.S.: Recent Work on Placental Transm

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn F W.C.2
5 P.M. Sir Heneage Ogilvie: Surgical Handicraft. (Brad lecture.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Dr. Godtfredsen (Denmark), Mr. E. Davis: Eye Signs in Malignant Nasopharyngeal Tum Mr. F. W. Law: Ring Scotoma after Retrobulbar Ne Cases will be shown.

PROVISIONAL NATIONAL COUNCIL FOR MENTAL HEALTH
10.30 A.M. (Caxton Hall, Westminster, S.W.1.) Conferen Mental Health: opening session. Dr. J. R. Rees: Ap tion to the Civilian Population of War-time Exper of Neurosis and Backwardness in the Forces. Dr. Main: Employment of the Mentally and Emotio Handicapped.

SOCIALIST MEDICAL ASSOCIATION
7.30 P.M. (296, Vauxhall Bridge Road, S.W.1.) Dr. F. R. G. H Social Aspects of Tuberculosis.

LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. Sydney Thomson: Animal Diseases Communic to Man.

Friday, 15th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, C Anne Street, W.1
5 P.M. Dr. J. M. H Campbell: Heart in Pregnancy.

ROYAL SOCIETY OF MEDICINE
8 P.M. *Obstetrics and Gynæcology.* Mr. Everard Williams Terence Millin: Stress Incontinence in Micturition.
8 P.M. *Radiology.* Miss M. S. Cripps, Miss Baker, Dr Fr Dr. N. S. Finzi: X-ray Treatment of Inflamm Diseases.

FACULTY OF RADIOLOGISTS
2.30 P.M. (Royal College of Surgeons.) Sir Gordon Gordon-Ta Malignant Tumours of the Testicle. (Skinner lecture.)

TUBERCULOSIS ASSOCIATION
3.15 P.M. (26, Portland Place, W.1.) Dr. J. F. Brailsford: T nique and Standardisation of Radiographs of the Cl
5.15 P.M. Dr. G. S. Todd, Dr. David Anderson: Chest Diseases Flying.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
8 P.M. (West London Hospital.) Clinico-pathological meetin

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. Shirley Smith: Heart in Pulmonary Disease.

OBSERVATIONS ON THE SYCHOLOGY OF THE TUBERCULOUS*

GEORGE DAY
M.A., M.D. Camb.
RESIDENT PHYSICIAN, MUNDESLEY SANATORIUM, NORFOLK;
LATE CAPTAIN R.A.M.C.

THE material for this study is drawn from a rather ecialised class of tuberculous patient. These patients, r their relations, are in a position to afford substantial es for their sanatorium treatment. This buys them etailed and unhurried medical attention as well as rather xurious amenities which they would not enjoy in less expensive establishment. This specialised class oes not, however, consist of the Idle Rich. The Idle Rich either does not get tuberculosis, or, if it does, takes t to Switzerland or the South of France. Our patients re mostly hard-working professional men and women, nd are drawn from the Army, the Navy, the Church, nd the Stage—barristers, doctors, schoolmasters, bookmakers, business men, and their wives, sons, and aughters.

It is a special group in that the patients have not been subjected to the stresses and strains classically held to be responsible for pulmonary tuberculosis—malnutrition, overcrowding, bad working conditions, or exposure. By this standard there appears to be no excuse for their breakdown. Then why do they break down? Obviously because they have become infected by the tubercle bacillus (as we all do); but for some reasons their tissues are in a condition to give it a good home instead of destroying it or imprisoning it for life. Is it just by chance that their tissues are so hospitable?

In 1935 I noticed a striking thing. So often there emerged from the patient's recent history an unhappy love episode. Girls had been jilted, young men had got themselves engaged to the utterly wrong girl, and were in painful conflict realising it more or less consciously. This state of affairs seemed to be far commoner than chance would warrant. It looked as if the Victorian novelists had got hold of a little-understood truth when they portrayed their lovelorn heroines going into a decline.

Another puzzling aspect was that tuberculosis struck down young adults. Why? The physical body should surely then be at its prime. It is fully grown: metabolism is no longer concerned partially with growth and development but wholly with repair and replacement. Could the answer be that young adulthood is a time when emotional stresses reach their highest peak? In the group I am discussing it is a time for weaning from the family circle and the backing and security of the home. The men in particular have to stand on their own feet and accept the consequences of their choice, be it of helpmeet or lifework. It is a time of hopefulness, too much hopefulness perhaps; but it is a worrying time, indeed a frightening and suicidal time for some.

As time went on I found I could extract relevant facts from an increasing proportion of patients—it increased from about 5% to nearly 50% as my shyness wore off and as I came to use dream analysis. And in 60% of these cases I could discern a very good reason why tuberculosis or some similar chronic incapacitation was *necessary* to them at that juncture. I could also see why it would continue to be necessary to them, unless something in their life-pattern suffered change. But it was disappointingly seldom that I was able to do anything to bring the change about.

So in 30% of the whole sanatorium population, I decided, the patient was sick in mind as well as body.

CASE OF THE YOUNG DOCTOR

My first case is that of a young Irish doctor who developed pulmonary tuberculosis while doing a house-physician's job in the south of England.

Alan was a popular stocky little fellow—the bustling rugger-forward type—full of vitality, who rapidly became persona grata with everyone in the sanatorium. His lesions, however, failed to respond to treatment, and he was still on bed rest at the end of six months. An artificial pneumothorax was attempted, but it did not relax the cavity-containing zone, because there was an intractable adhesion holding it out. He had a three-month course of 'Sanocrysin' injections without converting his sputum even temporarily. At the end of six months his general condition was good; he had gained lots of body-weight and looked and felt fighting fit, but his rectal temperature rose to 37·6° C (99·7° F) each evening; his sputum, though scanty, was still positive; his blood-sedimentation rate remained steadily higher than it should have been. His disease activity was in statu quo.

Then we crushed his phrenic nerve. It worked like a charm. His diaphragm rose and within a few days his temperature had dropped to normal limits. His B.S.R. dropped steadily and he became sputum-free. And then he awoke one morning with glove-and-stocking anæsthesia. Being a doctor he had diagnosed it himself before we could answer his bell, and we found him bellowing, "Why the hell have I got a conversion hysteria?" It was no good asking *us*. *We* didn't know. He started sweating almost continuously; he couldn't sleep; and by the end of the week he had shrunk a stone in weight.

Then one evening in a darkened room he told his story. He was a Roman Catholic, and his fiancée, who was an extremely nice girl, was also a Roman Catholic. But he was possessed, as it were, of two personalities, a saint who was a devout practising Roman Catholic and a sinner who wasn't; and they were not on speaking terms. The saint adored his beloved with religious fervour, but the sinner treated her differently. His fiancée was devoted to him, but was shamed at being forced to enjoy prenuptial bliss against her better inclinations. So their relationship became degraded in both their eyes, and they were pretty miserable though deeply in love with each other. I think it is significant that he took a house-job in the south of England—just about as far from Ireland as he could get.

Here he became involved with a nurse, developed the signs and symptoms of tuberculosis (with, he confessed, no little feeling of relief), and sped back to Ireland to his mother and his fiancée. He was not too easy there, and he again elected to cross large tracts of land and water to Mundesley, where he was happy, carefree, and well esteemed by his fellows. And now, when he showed *signs* of getting better of his tuberculosis, he himself gets very sick in spirit. It seemed obvious that he was not yet ready to re-enter the world from which tuberculosis had afforded him escape.

What seemed so odd to me was that he had never grouped all these phenomena in his own mind before; but then I suppose people don't. He *did* see it when it was pointed out to him, and he *did* see that the saint in him and the sinner in him had to be reconciled and come to terms and be atoned, if he wanted to become an integrated human being.

The next thing that happened was that he sent for his fiancée, confessed all, and was forgiven. He made a rapid and uninterrupted progress from then onwards.

Two years later I ran into him again, and he was simply crackling with good health. But I noticed he did not introduce me to the girl he had with him. I couldn't help wondering whether the saint hadn't mixed a little too freely with the sinner, and ended up like the young lady from Riga.

FANTASIA

From a particular and completely unvarnished case-history I wish to turn to a blended version of several cases which had sufficient points in common for this

---

* A paper read to the Northfield Psychiatric Society, Northfield Military Hospital, Birmingham, in November, 1944.

Association of Plastic Surgeons

The meeting to inaugurate this association, at the Royal College of Surgeons on Wednesday, Nov. 20, at 5 P.M., will be followed by a dinner at the college. Those wishing to attend the dinner should notify the secretary, Sir Harold Gillies, 149, Harley Street, London, W.1.

Genetical Society

A public lecture will be delivered at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, at 5 P.M., on Friday, Nov. 22, by Prof. Tage Kemp, director of the University Institute of Human Heredity, Copenhagen, who will speak on *Multiple Factors in Morbid Inheritance*; a film, *the Fat Dwarf*, will be shown.

Socialist Medical Association

The following lectures will be given at 296, Vauxhall Bridge Road, S.W.1, on Thursdays, at 7.30 P.M.: Nov. 14, Dr. F. R. G. Heaf, Social Aspects of Tuberculosis; Nov. 28, Dr. F. Avery Jones, Social Aspects of Peptic Ulcer; Dec. 12, Dr. J. Tylor Fox, Social Aspects of Epilepsy; Jan. 2, Dr. A. T. M. Wilson, Social Aspects of Medical Psychology; Jan. 16, Dr. J. N. Morris, Social Aspects of Juvenile Rheumatism; and Jan. 30, Dr. H. Joules, Occupational Hazards of the Health Worker.

Association of Anæsthetists

On Oct. 31 the Association of Anæsthetists of Great Britain and Ireland celebrated the centenary of anæsthesia by holding a dinner in the great hall of Lincoln's Inn. Sir Alfred Webb-Johnson, P.R.C.S., said that the achievements of British medicine in the past hundred years made up one of the brightest constellations in the history of this country. The early work on anæsthesia formed a sort of prologue to the development of antisepsis, X rays, radium, bacteriology, vitamins, and hormones. Anæsthetists might well feel what Oliver Wendell Holmes called "a noble satisfaction" in steering their patients through some of the most critical situations of life. They were right to insist on their status, which was that of a practical practising physician, administering drugs of great potency, and assessing the fitness of patients to receive them. They were also practical common-sense people who had established their headquarters in Lincoln's Inn Fields. Dr. A. D. Marston, the president, said that anæsthetists had much to gain from other specialties and from combined operations against disease. But they also had their autonomous moments and were expanding their sphere, and he was glad to see that Birmingham had led the way by putting an anæsthetist in charge of resuscitation and the treatment of shock. Not so long ago the British Medical Association held that every general practitioner's knapsack held a bottle of chloroform which might be used at any time for any operation; but the B.M.A. now recognised the value of the specialist anæsthetist and had acceded to a request from 400 members to form an anæsthetists' group. Replying to Dr. John Gillies's toast of The Guests, Dr. Charles Hill, secretary of the B.M.A., feared lest the bottle of chloroform in the practitioner's knapsack might be replaced by a mass of printed forms to be completed in triplicate. Commenting on reports of a recent speech by Mr. Bevan to medical students, he concluded a topical rejoinder by remarking that the Minister needed no guidance in using the chloroform which comforts, the ether which irritates, or the curare which induces muscular relaxation. Dr. Wesley Bourne, of Montreal, bringing greetings from Canada and the United States, pointed out that, in commemorating the early anæsthetists, we should properly go back to the philosophers of chemistry—Priestley, Davy, Lavoisier, Faraday—by whom man has ever since been kept on tiptoe. He quoted Paget's saying that the fault in specialisation lies not in narrowness but in shallowness and a sense of self-sufficiency. Dr. Murchi, of Copenhagen, also responded as a guest. Finally, Dr. Z. Mennell said that, as every anæsthetist knows, what counts is the man behind the machine; and the president's health was drunk with musical honours.

Corrigenda.—In our annotation on Training in Child Welfare (*Lancet*, Oct. 26, p. 608) we stated that the National Nursery Certificate is planned for girls between 14 and 16 years of age. Actually it is planned for girls between 15 and 17, and the age is to be raised to 16–18 as soon as possible.

An annotation last week on Cancer of the Corpus Uteri quoted Professor Heyman as saying that in reported series of cases treated by hysterectomy he had found a relative five-year survival-rate of 40–50%. The percentage should have been stated as 48–55.

Appointments

BECK, A., M.D. Frankfurt, L.R.C.P.E.: pathologist, North-
Hospital, Hampstead.

BOWYER, H. W., M.D. Glasg.: assistant physician to outp
Bolton Royal Infirmary.

HERVEY, W. A., F.R.C.S.E.: otorhinolaryngologist, Queen
Hospital for the East End, London.

London Hospital, Whitechapel:

BOWEN-DAVIES, A., M.B. Camb., F.R.C.S.: assistant sur
aural department.

PERRY, K. M. A., M.D. Camb., M.R.C.P.: assistant physic

THOMPSON, V. C., M.B. Lond., F.R.C.S.: assistant sur
thoracic department.

VAUGHAN-JACKSON, O. J., B.M. Oxfd, F.R.C.S.: assistant
to orthopædic and accident department.

Hampstead General and North-West London Hospital:

ENZER, J., M.R.C.S.: physiotherapist.

HINDENACH, J. C. R., M.D. N.Z., F.R.C.S.: orthopædic and
surgeon.

Middlesex County Council:

DISCOMBE, G., B.SC., M.B. Lond.: pathologist, Central M
County Hospital.

HELLER, R., M.D. Rome and Vienna: tuberculosis
officer.

MCQUISTON, T. A. C., M.D. Belf.: tuberculosis medical o

MEYER, B. U., M.B. Lond., D.C.H.: assistant tuberculosis

ROBINSON, C. A., M.B. Camb., D.M.R.E.: consulting
therapeutist, West Middlesex County Hospital.

STEWART, C. J., M.B. Lond., D.R.C.O.G.: assistant tub
officer.

STRADLING, P., M.B. Lond.: assistant tuberculosis officer

TRENCHARD, H. J., M.B. Birm., M.R.C.P.: tuberculosis
officer.

Colonial Service:

COSGROVE, P. C., M.B. Dubl., M.R.C.P.I., D.T.M.:
(physician), Sierra Leone.

DA COSTA, A. B., M.B. Edin.: district medical officer, St.
Windward Islands.

FOLEY, E. J., M.B. Lpool, D.P.M.: specialist (psyc
Tanganyika.

FORSTER, E. F. B., M.B. Dubl.: African medical officer,

FOSKETT, D., M.B. Camb.: medical officer, Kenya.

FREEMAN, D. E., M.B. N.U.I.: medical officer, grade II,
Solomon Islands Protectorate.

HOLLINS, F. R. T., M.B. Dubl.: medical officer, grade II,

HOLUB, Z. C., M.D.: medical officer, Aden.

HOWAT, T. K., M.B. Glasg.: medical officer, Gold Coast

HUTTON, P. W., M.B. Camb., M.R.C.P., D.T.M. & H.:
specialist, Uganda.

LAMBERT, M. A., M.B.: medical officer, Leeward Island

LANGFORD, C. C., M.B. Dubl.: medical officer, Uganda.

MCSHINE, A. D., M.R.C.S.: medical officer, grade C, Trin

MERRY, C. H., M.R.C.S.: medical officer, grade C, Trinid

NICOL, B. M., M.B. Aberd.: medical officer, Nigeria.

OWEN, G. A., M.R.C.S.: medical officer, Gold Coast.

PETRIE, W. O., M.B. Edin.: medical officer, Nyasaland.

READ, M. T., M.C., M.R.C.S.: medical officer, Malaya.

RICHARDSON, R. K., L.R.C.P.E.: medical officer, grade C, T

ROBINSON, W. L., M.B. Belf.: resident surgeon, W
Islands.

RUSSELL, H. B. L., M.R.C.S.: medical officer, Gold Coa

SMALL, T. M., L.R.C.P.E., D.P.H.: medical officer of health,
Trinidad.

SMITH, R. B. S., M.B. Durh., D.T.M., D.T.H.: senior
officer, Northern Rhodesia.

VAN DE LINDE, P. A. M., M.B. Lond.: medical officer, Hon

Births, Marriages, and Deaths

BIRTHS

JAMIESON.—On Oct. 24, at Edinburgh, the wife of Dr. J
Jamieson—a daughter.

MCDOWALL.—On Oct. 30, at Emsworth, Hants, the wife
E. B. McDowall—a daughter.

PRICE.—On Oct. 30, at Oxford, to Dr. Celia Westropp, the
Mr. Francis Price—a son.

STRONG.—On Oct. 27, at Liverpool, the wife of Dr. John S
a daughter.

STUART-HARRIS.—On Nov. 2, at Sheffield, the wife of Prof
Stuart-Harris, F.R.C.P.—a daughter.

THOMPSON.—On Oct. 25, at Horsham, the wife of Dr. F. A.
son—a son.

MARRIAGES

BROOKS—BLAGG.—On Oct. 31, at Car-Colston, Notts, Ge
Brooks, G.M., M.C., M.B., to Ursula Grace Blagg.

GRIFFIN—JORGENSEN.—On Oct. 26, at Chislehurst, Ge
Griffin, M.R.C.S., to Thelma Doreen Jorgensen.

DEATHS

BARNETT.—At Dunedin, New Zealand, Sir Louis Edward
C.M.G., M.D. Edin., F.R.C.S., emeritus professor of surge
University of Otago, aged 81.

CROFT.—On Oct. 31, at Nuneaton, John Thomas Herber
M.R.C.S.

HALSTED.—On Oct. 29, at Selsey, Sussex, Harold Cecil
M.D. Durh., aged 81.

HIRD.—On Oct. 30, at Wimbledon, Frederick Robert Hird,

MCKENDRICK.—On Oct. 31, at Glasgow, John Souttar McKe
M.D. Glasg., F.R.F.P.S., F.R.S.E., aged 72.

MILLIGAN.—On Oct. 30, at Bournemouth, James Milliga
Durh., L.D.S. R.C.S.

THORNTON.—On Oct. 26, at Pretoria, Brigadier Sir Edward N
Thornton, K.B.E., V.D., M.R.C.S., D.P.H.

VAKIL.—On Oct. 23, in London, Chunilal Bhimbhai Vakil,
aged 63.

OBSERVATIONS ON THE SYCHOLOGY OF THE TUBERCULOUS*

GEORGE DAY
M.A., M.D. Camb.
RESIDENT PHYSICIAN, MUNDESLEY SANATORIUM, NORFOLK;
LATE CAPTAIN R.A.M.C.

THE material for this study is drawn from a rather pecialised class of tuberculous patient. These patients, r their relations, are in a position to afford substantial es for their sanatorium treatment. This buys them etailed and unhurried medical attention as well as rather xurious amenities which they would not enjoy in less expensive establishment. This specialised class loes not, however, consist of the Idle Rich. The Idle Rich either does not get tuberculosis, or, if it does, takes t to Switzerland or the South of France. Our patients re mostly hard-working professional men and women, nd are drawn from the Army, the Navy, the Church, nd the Stage—barristers, doctors, schoolmasters, bookmakers, business men, and their wives, sons, and daughters.

It is a special group in that the patients have not been subjected to the stresses and strains classically held to be responsible for pulmonary tuberculosis—malnutrition, overcrowding, bad working conditions, or exposure. By this standard there appears to be no excuse for their breakdown. Then why do they break down? Obviously because they have become infected by the tubercle bacillus (as we all do); but for some reasons their tissues are in a condition to give it a good home instead of destroying it or imprisoning it for life. Is it just by chance that their tissues are so hospitable?

In 1935 I noticed a striking thing. So often there emerged from the patient's recent history an unhappy love episode. Girls had been jilted, young men had got themselves engaged to the utterly wrong girl, and were in painful conflict realising it more or less consciously. This state of affairs seemed to be far commoner than chance would warrant. It looked as if the Victorian novelists had got hold of a little-understood truth when they portrayed their lovelorn heroines going into a decline.

Another puzzling aspect was that tuberculosis struck down young adults. Why? The physical body should surely then be at its prime. It is fully grown: metabolism is no longer concerned partially with growth and development but wholly with repair and replacement. Could the answer be that young adulthood is a time when emotional stresses reach their highest peak? In the group I am discussing it is a time for weaning from the family circle and the backing and security of the home. The men in particular have to stand on their own feet and accept the consequences of their choice, be it of helpmeet or lifework. It is a time of hopefulness, too much hopefulness perhaps; but it is a worrying time, indeed a frightening and suicidal time for some.

As time went on I found I could extract relevant facts from an increasing proportion of patients—it increased from about 5% to nearly 50% as my shyness wore off and as I came to use dream analysis. And in 60% of these cases I could discern a very good reason why tuberculosis or some similar chronic incapacitation was *necessary* to them at that juncture. I could also see why it would continue to be necessary to them, unless something in their life-pattern suffered change. But it was disappointingly seldom that I was able to do anything to bring the change about.

So in 30% of the whole sanatorium population, I decided, the patient was sick in mind as well as body.

CASE OF THE YOUNG DOCTOR

My first case is that of a young Irish doctor who developed pulmonary tuberculosis while doing a house-physician's job in the south of England.

Alan was a popular stocky little fellow—the bustling rugger-forward type—full of vitality, who rapidly became persona grata with everyone in the sanatorium. His lesions, however, failed to respond to treatment, and he was still on bed rest at the end of six months. An artificial pneumothorax was attempted, but it did not relax the cavity-containing zone, because there was an intractable adhesion holding it out. He had a three-month course of 'Sanocrysin' injections without converting his sputum even temporarily. At the end of six months his general condition was good; he had gained lots of body-weight and looked and felt fighting fit, but his rectal temperature rose to 37·6° C (99·7° F) each evening; his sputum, though scanty, was still positive; his blood-sedimentation rate remained steadily higher than it should have been. His disease activity was in statu quo.

Then we crushed his phrenic nerve. It worked like a charm. His diaphragm rose and within a few days his temperature had dropped to normal limits. His B.S.R. dropped steadily and he became sputum-free. And then he awoke one morning with glove-and-stocking anæsthesia. Being a doctor he had diagnosed it himself before we could answer his bell, and we found him bellowing, "Why the hell have I got a conversion hysteria?" It was no good asking *us*. *We* didn't know. He started sweating almost continuously; he couldn't sleep; and by the end of the week he had shrunk a stone in weight.

Then one evening in a darkened room he told his story. He was a Roman Catholic, and his fiancée, who was an extremely nice girl, was also a Roman Catholic. But he was possessed, as it were, of two personalities, a saint who was a devout practising Roman Catholic and a sinner who wasn't; and they were not on speaking terms. The saint adored his beloved with religious fervour, but the sinner treated her differently. His fiancée was devoted to him, but was shamed at being forced to enjoy prenuptial bliss against her better inclinations. So their relationship became degraded in both their eyes, and they were pretty miserable though deeply in love with each other. I think it is significant that he took a house-job in the south of England—just about as far from Ireland as he could get.

Here he became involved with a nurse, developed the signs and symptoms of tuberculosis (with, he confessed, no little feeling of relief), and sped back to Ireland to his mother and his fiancée. He was not too easy there, and he again elected to cross large tracts of land and water to Mundesley, where he was happy, carefree, and well esteemed by his fellows. And now, when he showed signs of getting better of his tuberculosis, he himself gets very sick in spirit. It seemed obvious that he was not yet ready to re-enter the world from which tuberculosis had afforded him escape.

What seemed so odd to me was that he had never grouped all these phenomena in his own mind before; but then I suppose people don't. He *did* see it when it was pointed out to him, and he *did* see that the saint in him and the sinner in him had to be reconciled and come to terms and be atoned, if he wanted to become an integrated human being.

The next thing that happened was that he sent for his fiancée, confessed all, and was forgiven. He made a rapid and uninterrupted progress from then onwards.

Two years later I ran into him again, and he was simply crackling with good health. But I noticed he did not introduce me to the girl he had with him. I couldn't help wondering whether the saint hadn't mixed a little too freely with the sinner, and ended up like the young lady from Riga.

FANTASIA

From a particular and completely unvarnished case-history I wish to turn to a blended version of several cases which had sufficient points in common for this operation. Here is an extract from an article I published pseudonymously just before the war[1]:

---

* A paper read to the Northfield Psychiatric Society, Northfield Military Hospital, Birmingham, in November, 1944.

> "The most hopeless case is the one who exhibits what I call the 'Dornford Yates syndrome.' She (and it's nearly always a she) really believes that somewhere round the corner there exists such a world as that gifted writer portrays in his delirious fantasies: a world where women are worshipped from the crowns of their heads to their glittering insteps by clean-limbed leisured sportsmen with a taste for witty philandering; where every lawn is centuries old and every car a Rolls. It is a make-believe world we create whenever we put on evening dress and smoke cigars and behave a little above ourselves; but most of us accept the twopenny bus-ride back to reality with something like relief.
>
> "The 'D.Y.S.' not only believes it exists, but that it is her rightful kingdom from which she is exiled for having been born to the wrong parents or having married the wrong husband. Cinderella's Prince Charming does not live up to premarital sample. Disabling illness of any kind provides an escape from reality into a world which matches her fantasy. On her admission to a nursing-home or sanatorium she enters her kingdom—or should I say queendom? Enthroned in bed she gains the power and the glory about which hitherto she has only been able to dream. Meticulous service she exacts from all who attend her, rewarding here with a gracious word, reproving there with queenly displeasure. Visitors, inquiries, gifts of flowers, and exciting negligées all heighten the illusion. Her rapid unpopularity among the other patients is, of course, rationalised. 'The other patients dislike me, my dear, simply because the doctors make rather a favourite of me,' confided a Queen Me to a newcomer (who went to the trouble of ascertaining if it were true!)—'I have never been so neglected in my life,' she once snapped at a goggling floor-maid, and added, skilfully avoiding understatement, 'but then at home I had seven servants.'—'Really, mum, would that be all together or one after another?' innocently asked the floor-maid; and was reported for impertinence.
>
> "Reality has an uncomfortable way of breaking through the best fantasies, and, when it does, the time has come to move to another establishment, bearing horrific tales of the short-comings of the last one which forced the patient to abdicate.
>
> "Now, the striking feature about cases of this kind is not that the disease runs a sluggish and protracted course, but that all attempts at adjuvant treatment seem doomed to meet with failure. Artificial pneumothoraces prove unselective; section of adhesions fails to close cavities; sanocrysin therapy provokes forbidding constitutional reactions. A malign Fate seems at work. A dramatic improvement once occurred when a husband's interest was found to be straying elsewhere.... But it might equally well have caused a dramatic decline, so it is not to be advocated. She is, after all, the victim of a disorder more intractable even than her tuberculosis, which is in comparison only a stage-property. She is perfectly adjusted to Being an Invalid, so why should she get well?"

PSYCHOLOGICAL ASSISTANCE

In general practice, having decided that an illness is functional and psychopathological in origin, one is faced with the problem—what is to be done about it? It is profoundly difficult to bring home to a patient one's conviction that he has within him a "black spot, not so big as a pin's head, but waiting to spread and destroy him in the fullness of time"—when the black spot is neither cancer nor tubercle but—Fear. Unless seriously distressed, patients in private practice are apt to take umbrage at the mere suggestion that they should undergo any systematic psychological treatment. It is an aspersion on their sanity. But delicate, difficult, and disagreeable as the task may prove, such a patient must have it brought home to him that he is sick at heart as well as in body, and that he can be helped to help himself. Before anything can be attempted he must become aware of a need for help and feel a genuine desire for it. Only then will he cooperate without doubts and misgivings.

Personally, I have found that dream analysis meets most situations, if you have the time; and in sanatorium practice you have plenty of time. It starts off like a new game, but soon becomes more and more eng and deeper and deeper in its effect, and eventually patient gets the knack of analysing his own dreams the minimum of guidance. In fact he does all the When he gets tied up he asks for guidance, and in happy experience at this stage your presence is purely catalytic. It doesn't matter what you say suggest. If your suggestion misses the mark, it bou off and is ignored. You have done no harm. But if hit the gold, it "brings him up all standing and car away his bob-stay"; or perhaps, better still, your sug tion is angrily repudiated, resisted, and rejected. you have sown the seed, and it is only a matter of t before it flowers. Quite often a misunderstanding ring the bell:

> A discontented ex-patient, who was living alone lodgings in the village (rather than go home to her mot putting off the evil day), used to come up to see twice a week. Her mother was her chief immediate prob The mother was a deaf and dowdy earnest woman rather disliked her darling daughter but did not know The darling daughter detested her mother, knew it, gloried in it.
>
> One day the girl was pouring out a long dream with her o running commentary, but my mind was elsewhere. The vill amateur dramatic society, I knew, was about to start wor just the thing for her! Give her a chance to meet some peo purposefully and not merely socially. She'd be able to g herself a much-needed rest for two or three evenings a we Impulsively I blurted out, "Are you interested in amat theatricals?" "I *loathe* amateur theatricals," she repli "Why?" "All right, all right. Don't snap my head Nothing, nothing. Go on. I'm listening."
>
> The next time she came to see me she said, "Sorry I so dense. The penny didn't drop until next day. I know why you asked me about amateur acting, you pig. It's p fectly true; I *am* dramatising myself the whole time. I ne realised it before. What can I do about it? I find I'm doi it the whole time, blast you." For the first time she completely natural.

And that is the way of it. Very often one's mo cryptic utterances, which one could not explain or defe if challenged, may bear fruit. For whoever carries question to the oracle on his lips also carries the answ in his heart. Shakespeare came very near it when said:

> "Our remedies oft in ourselves do lie
> Which we ascribe to Heaven."

He might have added "or to the doctor."

In my next case I used dream analysis and unearth material I could not possibly have got any other wa for the patient was intelligent and intellectual and h an almost maddening amount of poise.

> She had read more Freud than I had, and thought th was a tremendous lot in it—applied to other people. By standards she judged herself to be pretty well all right. T patient was a doctor's wife and therefore had not been di nosed until both her lungs had become pretty extensive excavated. She was treated with bilateral A.P.s, adhesio were cauterised on both sides, and from the viewpoint pure lung-carpentry we achieved what we wanted. But s did not heal. She hung fire.
>
> Her dreams showed clearly that her marriage was a failu —more, that it was in effect her wasting disease of which tuberculosis was a somatic expression. She had never admitt that she was ill-mated, even to herself. Her husband, w had a touch of the Asiatic in his blood, was an expert a experienced love-maker. One moment he fascinated and ter fied her by his ruthlessness, and the next could put on a "hurt small boy" act which never failed to arouse her motherly feelings. At every turn she was completely in his power and completely frustrated from being herself when he was about.
>
> One dream I would like to relate without comment. She was fishing in clear deep water from the lower steps of a jetty, when suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay straight at her. She turned,

---

[1] *Lancet*, 1939, i, 1343.

reaming in terror, and fled up the steps to me, who was tanding at the top, and awoke.

Eventually she decided to divorce her husband for cruelty, oth mental and physical, for which she had a very good case, nd her papers were sent in. Her tuberculosis which had hung re all these months began to get better.

The case was defended and lasted three days. She had a ruelling time in the box, for her ruthless husband had left o sofa-cushion unturned in his search for letters of one sort r another with which to bolster up his counter-evidence. he came through well and won hands down.

After the decree nisi she was forced to have embarrassing ealings with her ex-husband concerning the welfare of heir joint children, and her emotions towards him were ather confused. He was so charming, courteous, and onsiderate.

She continued to send me her dreams with her own interretations for my comments. And this is the last one she ent me. She was fishing in deep clear water from the lower teps of a jetty, as in the other dream, but on the other side, acing east instead of west. Suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay at her. She turned, screaming in terror, and was about to flee up the teps, when she heard me chuckling with amusement. So she tood her ground and seized the monster in both hands. It shrank and shrank until it was a poor little iridescent minnow in the palm of one hand. She gently threw it back into the water.

(I will comment on this second dream. I think it pretty decent of her unconscious to drop us a line to let us know how we are getting on.)

She married again, this time a man more her own weight, somebody who laughs at the same thing as she does, and her tuberculosis is arrested.

HAPPINESS IS NOT ENOUGH

To me, concerned with getting people to overcome their tuberculosis by fair means or foul, that case strengthens my belief that a change of heart and a change of circumstances can be necessary before healing will proceed. My next one shows how change of circumstances alone. . . .

Peggy had an unfortunate early history. She never knew her father, her mother died when she was fourteen, and from then onwards she was self-supporting. She was in turn parlourmaid, cook, chorus girl, shop girl, mannequin, and glamour girl. She worked her way out to Canada as a stewardess and back again when she'd had enough. She then married a rather worthless playboy racing-motorist who was pretty poor both in money-sense and woman-sense. She had to sell her jewels to keep him, and to work in a hat-shop to earn the rent for their flat. He contributed nothing unless he backed a winner with his pocket-money, when they blued it with the greatest enjoyment. It was only when he diverted her hard-earned rent to another woman's lap that she protested, walked out on him, and put in her papers for a livorce.

We next find her settled down comfortably as a young armer's wife, leading a happy outdoor life, riding, rearing, and breaking in colts, tending the poultry-farm, and having ovely fun in the kitchen. It was an idyllic existence. The oung couple were deeply in love with each other and the oung farmer lavished all the good things on her that she had ked before.

After a couple of years she developed a small patch in one ung and reddening of one arytenoid. These were discovered lmost accidentally, one might say, owing to the thoroughness f her general practitioner; for there were no physical signs. t was for other symptoms she consulted him. She was six eeks' pregnant. In accordance with general usage she was dvised to have therapeutic abortion, and this was done. After which no time was lost getting her under sanatorium treatment, where she was put on absolute rest.

From the hardships she had gone through she might have een by now a hard-mouthed hard-bitten disillusioned young oman; but she was not. She was one of the sunniest and weetest young women I have ever met. Nothing disturbed er infectious gaiety. She bubbled with fun and friendliness. verybody fell for her, women in particular. She had managed acquire and cherish somehow delight in poetry, music, nd sketching (Corot, Debussy, and Swinburne). She was the dored adopted aunt of about half a dozen children.

Her tuberculosis spread in both lungs, larynx, and trachea. Each X-ray film showed advancing shadows, until each lung looked like a snow-storm. She had to talk in whispers, and her swallowing of food was painful to watch. It was evident that she was going to die, and that nothing could be done.

A week or so before the end she developed a strong positive transference towards me; so I took to sitting with her at night when her dyspnœa frightened her, until her opiate took effect and she dropped off to sleep.

It was then that I learned her history and her bewildered attitude towards it. Her divorce had never gone through; so she had never been able to marry Bill, the young farmer. But that didn't worry her in the least; to her it was perfectly natural and right that she should make him happy. There was no feeling of guilt. She adored him; and her life with him and the horses, the ducks and the goats, *was* idyllic—but it was somehow *unreal*. Even had she been legally married to Bill, she would have continued to feel that her first unhappy marriage was the real one. Miserable and exasperated often, insecure always as she had been with the playboy, it was the small memories of midnight feasts—of a stray kitten they adopted on Christmas Eve and played with on the bed—it was memories like these that kept crowding in now. And then she said something startling. Without rancour or self-pity, without question and with complete acceptance, she said, "It looks as if I have a *need* to suffer." She died that night. There was no mistake about the dose of morphia.

I feel that her history is worth giving in some detail, because it has features in common with two other women patients. In all three cases there had been an unhappy but curiously vital first marriage, and a brief glimpse of happiness and security in a second unlegalised alliance, which seemed to them unreal and dreamlike in comparison. In all three the disease was diagnosed early and brought early to treatment without avail. They all lost their good looks and became skull-faced, with bodies and legs bloated with œdema. All three had sweet sunny dispositions; which persisted undimmed to the end in spite of their afflictions.

I must confess I am most puzzled and somewhat dismayed. Mere external happiness, adjustment to the outer world, doesn't seem enough.

CONFOUNDING THE DOCTORS

My last case is very different.

Gladys I first saw when I was still in general practice in 1933. She was aged about 19 and was a cheerful, cow-like, but rather slovenly cook-general in a farmer's household. I was attending the farmer, and, as I made my way out one day through the kitchen she told me she had been coughing up some blood and asked, "Did it make any difference?" Well, she was a real Queen Square conjoint case—bilateral excavation and a family history riddled with phthisis.

She was admitted forthwith into a sanatorium and discharged at the end of the statutory three months "improved." True she had gained a lot of body-weight and looked fitter, but the activity of her disease, although doubtless lessened, merited at least another three months on absolute rest, with a campaign to eliminate her cavities. She went home, and was on the club; and then she moved from the district and I lost track of her.

When she next came to me she was seven months' pregnant and had been married very nearly as long. She was pretty well, but I dreaded the labour and the puerperium. I can't remember the labour—it was probably a B.B.A.—but her disease *did* flare up and spread during the puerperium as I had feared; and with great difficulty I kept her in bed at home for three months. In fact she was still in bed when I sold out of the practice. Before abandoning her I told her she must never do it again and gave her explicit instructions how not to do it again. And had to add that it was nothing to giggle at either.

Some seven years later, in 1942, I spent my summer holiday doing a locum in my old practice—a fascinating and unique opportunity for follow-up which I could not resist. I was asked to call in and see Gladys, when I was passing that way, because of some hæmorrhage, and I was surprised thus to learn that she was still alive, and marvelled at her tenacity to life.

I called and found her spooning out dinner to nine children all below the age of $7^1/_2$. The children were singing and hammering the table with their spoons like the Christmas carol, while she sat placid and cow-like, smiling on her brood. The din was terrific.

The hæmorrhage was from a cervical erosion. She was not pregnant at the moment; so I persuaded her to have a further overhaul and radiography of her chest. The cavities, one of which used to be the size of a tangerine orange, had disappeared completely. There was plenty of firm-looking scar tissue but no sign of any activity.

I simply could not explain it; but, when her husband came in, I seemed to see daylight. He was an ordinary farm labourer, a cheerful good little worker, and a good family man. Though desperately poor and living primitively in a condemned cottage they were wildly happy and laughed a lot.

Here then is a matter for discussion. What made Gladys's disease, which was definitely *advanced* and progressive seven years before, heal in spite of the continued presence of all these classical adverse conditions? Why did she do better than our sanatorium patients? Can it have been sheer contentment? Or can it have been contentment plus the gratification of her deep creative impulse?

That raises another point. Phthisiologists make it a rule to forbid women to have babies for as long as five years after the cessation of all symptoms of activity, because of the tragedies which are apt to occur during the puerperium if the disease has not long been arrested, and is still latent.

All are agreed that the tuberculous woman often does phenomenally well during her pregnancy—even in the early months before the enforced rise of the diaphragm and the restriction of its movements can play any part in the mechanical relaxation and immobilisation of the lesions. It is, some say, as if some fœtal hormone assisted the mother's tissues to arrest the disease. Be that as it may, it is certainly the abrupt diaphragmatic descent during parturition which is responsible for the massive basal spread during the puerperium which is so often fatal.

Nowadays I take the line that this danger can be obviated successfully by the immediate induction after labour—or better still after cæsarean delivery—of a pneumoperitoneum; so that the volume of the pregnant uterus is replaced by an equivalent volume of air, to keep the diaphragm tented up. This may well be reinforced by phrenic interruption on the more threatening side. So far, in the few cases where this has been done, it has worked out very well.

Should this prove to make parturition less dangerous, I cannot help wondering whether pregnancy may not be a good therapeutic prescription, in appropriate cases, not only because of its mechanical and alleged endocrine advantages but also because it satisfies a deep-rooted instinct, and the patient is thereby granted a brand-new squalling reason for not dying.

Looking back I wonder if Peggy, the farmer's wife, might not have lived had her pregnancy been allowed to come to term.

NATURE OF THE DISEASE

My tentative conclusions are that patients who develop pulmonary tuberculosis in the absence of any of the classical physical environmental causes often do so because of dis-ease in their psychological environment—their relation to themselves or to the world outside.

We are all agreed that certain physical distressing circumstances lower a patient's resistance to disease, but that is only an empirical phrase to cover everyday experience. We really know nothing yet about the biochemical tissue changes (if any) that are involved when "resistance is lowered." We are only saying really that the soil is being made ready for the seed. The patient's tissues are ready to be diseased. In psychological distress the patient as a whole is ready to be ill—in fact is ill already. And the ubiquitous bacilli both *endogenous and exogenous are there ready to* oblige.

This is tantamount to saying that tuberculosis provides means for a flight from frustration, for self-punishment and all those other dark urges which are continually shipwrecking our best behaviour. I believe this, with half of me; but my alter or super ego would like to have mathematical confirmation. I cannot be whole-hearted until we can measure in grammes per litre the presence or absence of disease-resisting substances in the body fluids.

Even if we cannot accept that thesis fully, I think we must agree to the generalisation that every individual *reacts to a disease according to his personality*; from which it must follow that the psychoneurotic, when given a touch of tuberculosis, will exploit his disease process to suit his pattern of living—or of dying. Moreover, such a patient may develop a secondary reactive personality, of which the disease is a complementary and necessary part, as in the "Dornford Yates syndrome" I described earlier.

Obviously, if such a patient is to recover from his tuberculosis, we must treat more than the local lesions and the toxic manifestations. His concurrent psychological dis-ease must be alleviated, and alleviated in good time, if he is to recover and not become chronic or incurable. Time itself is notoriously a great healer in cases of emotional maladjustment that are not basic. The period of retreat in a sanatorium—that mother figure—brings about changes in both the inner and outer lives of many, probably most patients. They overcome the disease *when they are ready*. But for quite a few cases it would be as well if psychiatric help and guidance were at hand to expedite their readjustment.

POSTSCRIPT, 1946

The foregoing was written and delivered before I had received any psychiatric training or had been taught the correct terminology. I have since learned by experience in *Army psychiatry that it* is not always necessary to raise conflicts and forgotten traumata to the conscious level. In a vast majority of everyday cases there is no more need to drag in—or drag out—the ubiquitous Œdipal Situation than there is to invoke the Second Law of Thermodynamics when soldering a kettle. Therapy can operate directly on the unconscious, giving it, as it were, a wholesome tweak which helps it to unravel itself. It is hard to understand how this happens, but no harder perhaps than understanding how many trusty empirical treatments—such as hot-water bottles, deep massage, and bottles of medicine—alleviate concealed underlying organs in distress. Both patient and physician are equally in the dark as to what really happens inside, but whereas *the patient* accepts the change gladly and unquestioningly, the physician cherishes a Scientific Hypothesis.

I have spared the reader—and myself—a great deal of trouble by refraining from rewriting the paper in the correct terminology.

"... The principal beneficence of a university should be that it stimulates an appetite for knowledge and understanding. You must not, of course, expect to *receive* education from your university; for a university that offered an orderly, finite, and readily comprehensible scheme of education—education as differenced from instruction—could only exist as th political instrument of a despotic or total State. To acqui education you must reach out for it. *You cannot obtain* i by sitting down as if to three rationed courses in a workers canteen; the process is more like picking blackberries, an some of the fruit you gather will certainly be green and caus distress."—ERIC LINKLATER in a rectorial address at Aberdee University, Oct. 26.

THE POLIOMYELITIS EPIDEMIC IN MAURITIUS

IN 1945

NICAL FEATURES AND ORGANISATION OF TREATMENT

H. J. SEDDON
NUFFIELD PROFESSOR OF ORTHOPÆDIC SURGERY IN
THE UNIVERSITY OF OXFORD

E. I. B. HAWES
E SQUADRON-LEADER R.A.F.V.R.

J. R. RAFFRAY
CAPTAIN R.A.M.C.

A MAJOR epidemic of poliomyelitis is always a serious tter. Where conditions are primitive and the medical vices exiguous, such an event is catastrophic; and may therefore be of interest to describe the measures ken for dealing with the recent outbreak in Mauritius. On March 21, 1945, one of us (H. J. S.) was informed the Colonial Office that poliomyelitis had broken t in Mauritius, and was asked to go there as quickly possible to do whatever was necessary for the care of se affected. As an island epidemic is a particularly vourable subject for epidemiological investigation, e Medical Research Council agreed to second Dr. A. M. cFarlan to conduct a survey. Miss Crossley, a physioherapist from the Wingfield-Morris Hospital, Oxford, as also a member of the party, and we left England y air on April 7.

Since it seemed likely that one of the greatest difficulties ould be shortage of staff—there are too few doctors in lauritius—we asked Lieut.-General Sir Alexander Hood, G.A.M.S., if he would allow one or more Army medical ficers serving in Africa to be seconded for work in Mauritius. is response was characteristically generous, and we were iven leave to discuss recruitment with the appropriate irectors of medical services. We were most hospitably ceived in Cairo by Major-General J. C. A. Dowse, and it as agreed that two men from M.E.F. would be sent to lauritius if East Africa were unable to spare anyone. However, we found Brigadier R. P. Cormack, E.A. Command, willing and able to help; Major G. W. A. Dick was ermitted to join Dr. McFarlan, and the services of two Mauritian Army doctors stationed in the island, Major L. de Chazal and one of the writers (J. R. R.), were promised. Another of the writers (E. I. B. H.) was stationed in Nairobi t the time and was permitted by Air Vice-Marshal Sir Brian aker to join the party. It was also agreed that we might all on the R.A.F. for supplies of 'Duralumin' required for aking splints, and that free use should be made of the air ansport service for the conveyance of pathological material om Mauritius to Uganda. Arrangements had been made or sending specimens for animal inoculation to Dr. K. C. mithburn at the Rockefeller Yellow Fever Research Institute t Entebbe.

We reached Mauritius on April 15 and started work n the following day. The island is some 38 miles from orth to south and 28 from east to west, and is situated the Indian Ocean about 600 miles east of Madagascar d 20 degrees south of the Equator. The total population is about 419,000; Indians (265,000) predominate d are mostly descendants of indentured labourers; ere are roughly three times as many Hindus as oslems. The 143,000 Creoles are descendants of African d Malagasy slaves. More recent arrivals are the hinese (10,000), who are almost all shopkeepers. The d-established colonists are of French descent and are latively few; and there is a sprinkling of people om the United Kingdom. The economy of the island epends almost entirely on its chief product, cane sugar.

FIELD ORGANISATION

By the time we arrived Dr. A. Rankine, director of edical and health services, had received notifications over a thousand cases. Dr. McFarlan decided that m the epidemiological standpoint it would be best start work in Savanne, a rural area with small communities, in which cases were still occurring at the time of our arrival. He then proposed to tackle an urban area (Port Louis, the capital); next Pamplemousses, a rural district adjoining the urban area of Port Louis; and finally the Rosehill district in which it was believed the epidemic began. From the clinical standpoint it hardly mattered where we started, but we thought it would be best to follow the epidemiologists.

The plan of campaign was as follows. The list of notifications gave a rough indication of the extent of the outbreak in each of the nine districts of the island. We tackled each district in turn. The government (district) medical officers, sanitary inspectors, health guards, sugar-estate doctors and dressers, and the village schoolmasters were most helpful in guiding Dr. McFarlan and Major Dick to the homes of patients (a few were already in hospital); but the detailed hunting down—there is no other way of describing it—could be done only by full-time workers. We were lucky to have some V.A.D. nurses at our disposal, intelligent young ladies from French families who knew every part of the island intimately and were fluent in its Creole patois. They soon became so efficient that it was possible to entrust them with many of the detailed inquiries appearing on the special case-sheet which we devised. As they collected their data Dr. McFarlan, Major Dick, and the V.A.D. nurses arranged for the patients to be sent to a convenient centre, such as a district or sugar-estate hospital, dispensary, or schoolroom, where we examined them one or two days later.

Muscle charts were used on which the extent of the paralysis was recorded according to the system of grading approved by the peripheral nerve injuries committee of the Medical Research Council (1943). The thorough examination of the muscles of a small child is laborious and time-consuming; but, unless observations are made in fair detail, there is no sure foundation for classification, prognosis, or treatment. The three of us were sometimes able to examine as many as 60 cases a day, though this is not to be recommended when working in a tropical climate. Those who required splints were measured for them, and lists were made, in order of urgency, of patients in need of hospital treatment. Few parents refused to allow their children to come into hospital; this was largely due to the powers of persuasion of the V.A.D.'s, though their approach was entirely objective and no specious promises of cure were made. At times the clinical team went ahead of the epidemiologists in order that as many patients as possible might be seen; but where this was done the attendances were rather less satisfactory and a second visit was usually necessary after the V.A.D.'s had rounded up the stragglers.

Information about the disease and its treatment was disseminated by broadcasts, and the distribution of printed versions of the broadcast talks; the press was most helpful throughout, the articles and reports that appeared being accurate and balanced. Lectures and demonstrations were given to doctors, and one lecture to school-teachers from every part of the island.

Most of our evenings were devoted to sorting out notes and orders for splints, and analysing data, and the volume of clerical work soon became considerable. Here again the Army came to the rescue; we were provided with two clerks from the A.T.S. and two from the R.A.M.C. Mrs. Moody, wife of the Colonial Secretary, and Mrs. Ward, wife of the Director of Education, also devoted many hours to the thankless task of making duplicates of the case-notes.

CLINICAL FEATURES

This paper summarises the clinical features of the outbreak, the epidemiological findings having been described elsewhere (McFarlan et al. 1946).

On account of our relatively late arrival, no search was made for non-paralytic cases. This would have been a tedious and time-consuming task because it would

More or less involvement of the trunk muscles was und in 85 cases in the sample: therefore a watch for the velopment of spinal curvature will have to be kept in out 170 cases—a very considerable number.

So far as treatment was concerned, we divided the tients into three groups:

Those with complete paralysis of one or more limbs sisting for 3–4 months.—According to Harry (1938) e prognosis in such cases is bad, and recent experience as confirmed his view. We therefore decided not to tain children so affected in hospital for a long period; hen it was clear that there was persistent total paralysis f a lower limb, an appliance was supplied, and the hild was discharged as soon as he could walk.

Patients with paralysis of the trunk muscles.—It was hought wise to retain such cases for a long period, ursing them in strict recumbency, in the hope of minimising the incidence of scoliosis and the need for supplying spinal or abdominal supports.

Patients with moderate paralysis, showing some improvement.—All these children have been treated intensively, and inpatient treatment will be continued until serial muscle charts show that no further improvement is occurring.

THE EMERGENCY HOSPITAL

In Mauritius there are barely enough hospital beds for the ordinary needs of the population. When Brigadier E. R. Cullinan, consulting physician, E.A. Command, visited the island towards the end of March, he urged the necessity for the immediate establishment of one large central emergency hospital, and as a result of his advice Colonel Ronald Yeldham handed over to the medical and health department a collection of huts on the racecourse at Floreal. The site was pleasant and healthy and the huts well built; the difficulty was to equip and open them within reasonable time; there had been three hurricanes between January and April, which had caused widespread damage, and there was shortage of labour and materials.

Although the conversion of the buildings began on April 9, the opening of the wards failed to keep pace with the enrolment of patients for admission, and we found ourselves in the unexpected and embarrassing position of being unable to deal adequately with the results of our propaganda. Parents brought their children to the gate of the hospital and demanded admission. We were equally anxious to get all the children who eeded treatment, about 420 out of the 1000, into ospital as quickly as possible, so that at least the evelopment of contractures might be prevented. As a emporary measure, admittedly unsatisfactory but better han nothing, some of the less urgent cases were admitted o sugar-estate hospitals and fitted with appropriate pparatus pending the opening of more wards at Floreal.

TABLE IV—INCIDENCE OF PERMANENT CRIPPLING

Sample: 500 cases—i.e., about half of the total

	Cases	
Died	29	(5·8%)
Early recovery	157	(31·4%)
Some weakness of one lower limb	130	(26·0%)
Both lower limbs affected; able to walk with difficulty and only if supplied with appliances	35	(7·0%)
Paralysis of both lower limbs and more or less involvement of trunk muscles; will get about only with great difficulty	29	(5·8%)
Paralysis of one upper limb, proximal segment	26	(5·2%)
Both lower limbs affected; likely to walk well with appliances	24	(4·8%)
Complete paralysis of one upper limb	16	(3·2%)
Widespread paralysis: may be bedridden	13	(2·6%)
Paralysis of one lower limb and trunk muscles; may walk well with appliances	11	(2·2%)
Paralysis of one upper and both lower limbs	10	(2·0%)
Paralysis of one upper and one lower limb	7	(1·4%)
Paralysis of trunk muscles alone	5	(1·0%)
Paralysis of face	3	(0·6%)
Paralysis of one upper limb, distal segment	2	(0·4%)
Paralysis of neck	2	(0·4%)
Paralysis of both upper limbs	1	(0·2%)
Total	500	

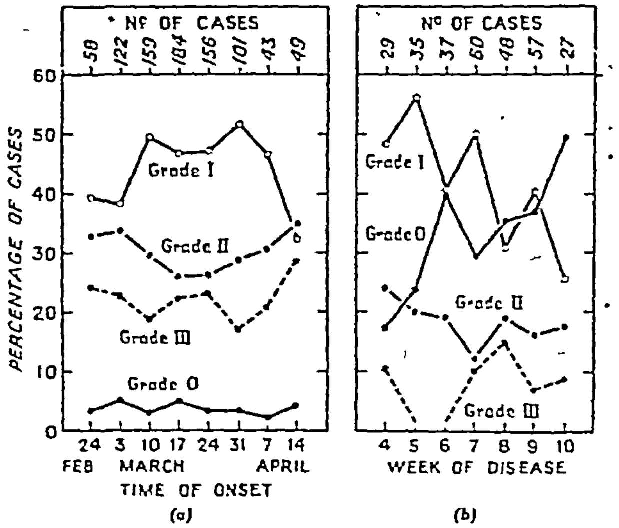


Fig. 1—Severity of paralysis, as determined by (a) history and (b) clinical examination. For explanation of grades see text.

In response to an appeal made to all the East African colonies Dr. and Mrs. H. B. Cumpston came to Mauritius, and they were appointed medical superintendent and matron of the hospital. The services of an Army sister were placed at our disposal by Lieut.-Colonel Leake, O.C. Station Hospital; in May, Dr. Henry de Boer, director of the Uganda Medical Service, sent one of his nursing sisters, and another Army sister was sent from Nairobi by Brigadier Cormack. The junior nursing staff consisted entirely of V.A.D.'s; they lacked experience and were imperfectly trained, but their enthusiasm and devotion to their work were most encouraging and they learned quickly from lectures and ward instruction.

TREATMENT

General Hygiene.—The huts were thoroughly cleaned and sprayed with D.D.T. before occupation. When a child was admitted, all its clothes were left outside. In almost all cases the hair was cropped short, and, after bathing, skin infections were promptly treated with appropriate ointments and paints. A child with poliomyelitis cannot be properly treated unless its skin is healthy. We were afraid that this rather drastic initiation might be resented by some parents, but it was not—they thought it was a necessary part of the treatment, as indeed it was.

Splints.—Plaster-of-paris is of little value for prolonged splinting of the lower limbs of small children (and in poliomyelitis the lower limbs are mostly affected), since it is easily soiled and disintegrates rapidly if wet with urine. Metal is essential, and experience of the Malta epidemic confirmed one's preference for duralumin. The Government of Malta sent the duralumin splints that had been used in the 1942–43 epidemic (Agius et al. 1945); after minor repairs all were fit for use, and we hastened to supply them to those patients whom they happened to fit.

It was agreed that one of us (E. I. B. H.) should be solely responsible for the supply of apparatus, and it was found that the workshops at H.M. prisons offered the best facilities for splint-making. There were no difficulties about shortage or impermanence of labour; and the costs of production were very low. Within a few weeks the Senior Chief Officer (Mr. W. McCormack) organised a skilled industry entirely new to the prisons; and the prisoners, many of them desperate criminals, were soon turning out large numbers of accurately fitting splints. Their sympathy and interest were aroused to such an extent that they devoted such spare time as they had to making toys for the children. And one evening, after they had finished installing some apparatus at the hospital, three reprieved murderers were found visiting each ward in turn and solemnly presenting toys to about a hundred small patients.

have been necessary to distinguish carefully between abortive attacks of poliomyelitis and mild recrudescences of malaria. About 96% of the patients whom we saw were or had been paralysed. Over 900 patients were examined; but, since some were not seen until shortly before our departure, we had to be content with more limited numbers for statistical analysis.

TABLE I—SITE OF INVOLVEMENT OF CENTRAL NERVOUS SYSTEM

Site	Lumbar	Lumbar and cervical	Cervical	Medulla	Uncertain	Total
No. of cases	258 (*64·3 %*)	88 (*22·0 %*)	38 (*9·5 %*)	10 (*2·5 %*)	7 (*1·7 %*)	401

Age-incidence.—Of 851 cases, 63·9% were in children aged 0–4 years and 30·9% in children aged 5–9. The extremes were a child aged 2 months and a man of 61.

Site of Paralysis.—Analysis of 401 case-histories gave an estimate of the frequency with which various parts of the central nervous system were affected (table I). *The lumbar enlargement was affected in 86·3% of cases.*

In 212 cases where only one side was paralysed there were 109 with paralysis of the left side and 103 with paralysis of the right. This equality was found in the subgroup with paralysis of one lower limb or of one lower and one upper limb, but in the 32 patients with paralysis of one upper limb only there were 21 with paralysis of the right and only 11 with paralysis of the left; this finding supports the suggestion made by several authors on clinical grounds, and supported by experimental evidence (Levinson et al. 1945), that the extent to which a part is used may have some bearing on the location of paralysis.

It has been said that trauma may also play some part in determining the site of paralysis. Of 8 cases with a history of trauma in the fortnight before illness, 3 later had paralysis of the lower limb which had been injured, and in 1 of them the other lower limb was also affected. In the remaining 5 cases the site of paralysis bore no relation to the site of injury.

Injections of quinine into the gluteal muscles had been given to 28 children during the fortnight before the onset of poliomyelitis. There were 13 to whom one injection was given; in 7 paralysis later appeared in the lower limb of the side on which the injection had been made, and in 6 the paralysis affected the lower limb of the opposite side. Injections into both buttocks had been given to 15 children; in 11 paralysis of both lower limbs followed, and in 4 paralysis of one lower limb. In none of these cases was paralysis due to action of the quinine on the sciatic nerve, though some such cases were seen. There was no convincing evidence of a relationship between the site of injections and the site of subsequent paralysis.

TABLE II—PERCENTAGE OF CASES WITH EACH GRADE OF PARALYSIS AS DETERMINED BY HISTORY

Grade	O	I	II	III	IV	Cases
Cases with onset—						
(*a*) before Feb. 24 or after April 8 ..	3·7	35 5	34·7	8·4	17·7	107
(*b*) between Feb. 25 and April 7 ..	3·8	46·7	28·7	10·0	10·8	765
All cases.. ..	3·8	45 3	29·4	9 8	11·7	872

Severity of paralysis in 872 cases, including 58 deaths, was roughly assessed in four grades according to the maximal extent of paralysis as determined by history (table II). Grade O comprised patients with weakness only but with clinical and epidemiological findings which made the diagnosis reasonably certain. In other cases paralysis of the face, neck, back, or respiratory muscles, or medullary paralysis was reckoned as equivalent t involvement of a limb, and grades I, II, and III com patients with paralysis of one, two, or three "limb respectively. Grade IV included patients with pa of four or more "limbs."

Paralysis of one "limb" was most common, and two "limbs" next most common. When the c were arranged according to the week of onset, it found that during the six weeks from Feb. 25 to Apri when the epidemic was at its height, there was a hi percentage than in earlier or later weeks of cases one limb paralysed and a lower percentage of cases two or more limbs paralysed. This suggests that the peak of the epidemic, as compared with earlier later periods, the virus was causing paralysis in m persons who had sufficient immunity to localise t infection to one part of the spinal cord. Faber et (1943) have provided some evidence of such immuni in cynomolgus monkeys after exposure of mucosa poliomyelitis virus. The percentage of cases in grade was the same in both periods; but little significance c be attached to this finding, since no particular sear for such cases was made; there were only *33 grade* cases among the 872.

The severity of paralysis in 293 cases was assess in a similar fashion on the results of clinical examinatio

TABLE III—PERCENTAGE OF CASES WITH EACH GRADE SEVERITY AS DETERMINED BY CLINICAL EXAMINATION

Week of disease	Grade of severity				Case
	O	I	II	III	
–4	17·3	48·4	24·1	10 2	29
5	24·0	56·0	20 0	..	35
6	40·0	40·5	19·0	..	37
7	28·2	50·0	11·8	10·0	60
8	35·4	31·1	18·9	14·6	48
9	36·8	40·4	15·8	7·0	57
10 +	48·2	25·9	17·4	8·5	27
All cases	32·7	42·3	16·5	8·5	293

It was found (table III and fig. 1) that the percentage recoveries (grade O) increased, and the percentage of singl limb paralyses (grade I) decreased, with the time elaps between the onset of illness and the day of examinatio

Hence, if the results of clinical examination we used to compare the severity of groups of cases, or cases in different epidemics, it would be necessary take into account the duration of illness at the time examination. In Mauritius the cases in Savanne appear *to be more severe than in Pamplemousses*, but t explanation was that in Savanne the epidemic was la and examinations were made early, whereas in Pamp mousses the reverse was the case. *Table III gives s indication of the average rate of recovery* during second month of the disease, but the estimate is clea less satisfactory than one obtained from successi examinations of the same patients.

Another analysis (table IV) was made to determine t incidence of permanent crippling; the figures were necessity provisional, since it was too early to ass the prognosis in all cases with much accuracy.

From this table we may deduce that the inciden of crippling (per thousand cases the approxima total) will be as follows:

Lower limbs: slight	Rather less than 260
" " moderate	" " 48
" " considerable	About 70
" " and trunk: much disability	Rather less than 80
Upper limbs: only slight	About 40
" " one useless	Rather less than 36
Bedridden	About 25

More or less involvement of the trunk muscles was ound in 85 cases in the sample: therefore a watch for the evelopment of spinal curvature will have to be kept in bout 170 cases—a very considerable number.

So far as treatment was concerned, we divided the atients into three groups:

Those with complete paralysis of one or more limbs xisting for 3–4 months.—According to Harry (1938) he prognosis in such cases is bad, and recent experience as confirmed his view. We therefore decided not to etain children so affected in hospital for a long period; hen it was clear that there was persistent total paralysis f a lower limb, an appliance was supplied, and the hild was discharged as soon as he could walk.

Patients with paralysis of the trunk muscles.—It was hought wise to retain such cases for a long period, ursing them in strict recumbency, in the hope of minimising the incidence of scoliosis and the need for supplying spinal or abdominal supports.

Patients with moderate paralysis, showing some improvement.—All these children have been treated intensively, and inpatient treatment will be continued until serial muscle charts show that no further improvement is occurring.

THE EMERGENCY HOSPITAL

In Mauritius there are barely enough hospital beds for the ordinary needs of the population. When Brigadier E. R. Cullinan, consulting physician, E.A. Command, visited the island towards the end of March, he urged the necessity for the immediate establishment of one large central emergency hospital, and as a result of his advice Colonel Ronald Yeldham handed over to the medical and health department a collection of huts on the racecourse at Floreal. The site was pleasant and healthy and the huts well built; the difficulty was to equip and open them within reasonable time; there had been three hurricanes between January and April, which had caused widespread damage, and there was shortage of labour and materials.

Although the conversion of the buildings began on April 9, the opening of the wards failed to keep pace with the enrolment of patients for admission, and we found ourselves in the unexpected and embarrassing position of being unable to deal adequately with the results of our propaganda. Parents brought their children to the gate of the hospital and demanded admission. We were equally anxious to get all the children who needed treatment, about 420 out of the 1000, into hospital as quickly as possible, so that at least the development of contractures might be prevented. As a temporary measure, admittedly unsatisfactory but better than nothing, some of the less urgent cases were admitted to sugar-estate hospitals and fitted with appropriate apparatus pending the opening of more wards at Floreal.

TABLE IV—INCIDENCE OF PERMANENT CRIPPLING

Sample: 500 cases—i.e., about half of the total

	Cases	
Died	29	(5·8%)
Early recovery	157	(31·4%)
Some weakness of one lower limb	130	(26·0%)
Both lower limbs affected; able to walk with difficulty and only if supplied with appliances	35	(7·0%)
Paralysis of both lower limbs and more or less involvement of trunk muscles; will get about only with great difficulty	29	(5·8%)
Paralysis of one upper limb, proximal segment	26	(5·2%)
Both lower limbs affected; likely to walk well with appliances	24	(4·8%)
Complete paralysis of one upper limb	16	(3·2%)
Widespread paralysis: may be bedridden	13	(2·6%)
Paralysis of one lower limb and trunk muscles; may walk well with appliances	11	(2·2%)
Paralysis of one upper and both lower limbs	10	(2·0%)
Paralysis of one upper and one lower limb	7	(1·4%)
Paralysis of trunk muscles alone	5	(1·0%)
Paralysis of face	3	(0·6%)
Paralysis of one upper limb, distal segment	2	(0·4%)
Paralysis of neck	2	(0·4%)
Paralysis of both upper limbs	1	(0·2%)
Total	500	

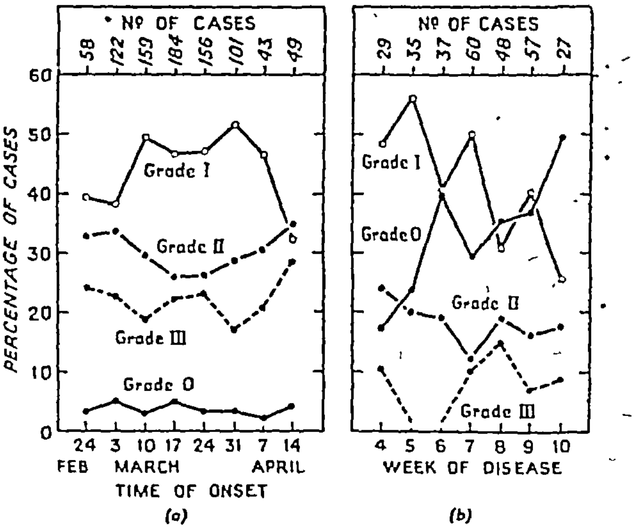


Fig. 1—Severity of paralysis, as determined by (a) history and (b) clinical examination. For explanation of grades see text.

In response to an appeal made to all the East African colonies Dr. and Mrs. H. B. Cumpston came to Mauritius, and they were appointed medical superintendent and matron of the hospital. The services of an Army sister were placed at our disposal by Lieut.-Colonel Leake, O.C. Station Hospital; in May, Dr. Henry de Boer, director of the Uganda Medical Service, sent one of his nursing sisters, and another Army sister was sent from Nairobi by Brigadier Cormack. The junior nursing staff consisted entirely of V.A.D.'s; they lacked experience and were imperfectly trained, but their enthusiasm and devotion to their work were most encouraging and they learned quickly from lectures and ward instruction.

TREATMENT

General Hygiene.—The huts were thoroughly cleaned and sprayed with D.D.T. before occupation. When a child was admitted, all its clothes were left outside. In almost all cases the hair was cropped short, and, after bathing, skin infections were promptly treated with appropriate ointments and paints. A child with poliomyelitis cannot be properly treated unless its skin is healthy. We were afraid that this rather drastic initiation might be resented by some parents, but it was not—they thought it was a necessary part of the treatment, as indeed it was.

Splints.—Plaster-of-paris is of little value for prolonged splinting of the lower limbs of small children (and in poliomyelitis the lower limbs are mostly affected), since it is easily soiled and disintegrates rapidly if wet with urine. Metal is essential, and experience of the Malta epidemic confirmed one's preference for duralumin. The Government of Malta sent the duralumin splints that had been used in the 1942–43 epidemic (Agius et al. 1945); after minor repairs all were fit for use, and we hastened to supply them to those patients whom they happened to fit.

It was agreed that one of us (E. I. B. H.) should be solely responsible for the supply of apparatus, and it was found that the workshops at H.M. prisons offered the best facilities for splint-making. There were no difficulties about shortage or impermanence of labour; and the costs of production were very low. Within a few weeks the Senior Chief Officer (Mr. W. McCormack) organised a skilled industry entirely new to the prisons; and the prisoners, many of them desperate criminals, were soon turning out large numbers of accurately fitting splints. Their sympathy and interest were aroused to such an extent that they devoted such spare time as they had to making toys for the children. And one evening, after they had finished installing some apparatus at the hospital, three reprieved murderers were found visiting each ward in turn and solemnly presenting toys to about a hundred small patients.

thus there is a round opening behind the knee. Two slots, 1 in. × $^{1}/_{4}$ in., are cut one on each side, $^{1}/_{4}$ in. from the lateral margin and 1 in. from the proximal end.

The thigh- and calf-pieces are joined at an angle of 15°, so that the foot-piece and the upper end of the thigh-piece both rested on the bed, with the contained limb in a comfortable position.

Calf-piece.—Unless it is for a short splint a half-circle is cut in the proximal edge, corresponding with that in the thigh-piece. Two slots are cut in the upper end similar to those in the thigh-piece, and two slots in the lower end set obliquely at 45° across the corners. The lower edge, and for a short splint the upper also, is moulded outwards to prevent chafing.

Foot-piece.—Shaped roughly like the sole of a boot. Two slots, 1 in. × $^{1}/_{4}$ in., cut one on each side, halfway along the length and $^{1}/_{4}$ in. from the edges.

Connecting L-piece.—Width $^{1}/_{2}$–1 in. according to size of splint. The straight portions of the L are riveted to the calf-piece for half its length and to the foot-piece for the whole of its length. There is a wide U-bend, $1^{1}/_{2}$–3 in. wide and deep, at the angle of the L, to accommodate the heel. A $^{3}/_{8}$ in. screw is riveted into the curve of the U to fit into the slot in the cross-bar.

Cross-bar.—For a single splint this consists of a straight strip 2–3 × 6–8 in. A hole is drilled in the centre to take the screw mentioned above. The bar is turned at right angles along its edges for greater strength.

The cross-bar for a double splint is curved, the curve being the quadrant of a circle of radius equal to the length of the lower limb. Slots are cut in the bar to allow variation in the degree of abduction.

MEASUREMENTS

The measurements supplied to the instrument-maker are body measurements, from which he works out the splint measurements as described below. The calculations are accurate for average-sized splints, and certain obvious allowances must be made for very large or small splints. The measurements of width for the thigh- and calf-pieces are on the flat before bending into an arc slightly wider than a semicircle.

Great trochanter to external condyle of knee	Subtract 3 in.	= Length of outer edge of thigh-piece
External condyle of knee to sole of foot	Subtract 2 in.	= Length of calf-piece for long splint
	Subtract 4 in.	= Length of calf-piece for short splint
Girth of thigh at groin ..	Divide by 2	= Breadth of thigh-piece at upper end
Girth at knee	Divide by 2	= Breadth of thigh-piece at lower end, and breadth of calf-piece at upper end
Girth above malleoli ..	Divide by 2	= Breadth of calf-piece at lower end
Length of foot, heel to great toe	Add 2 in.	= Length of foot-piece
Breadth of forefoot ..	Add $^{1}/_{2}$ in.	= Breadth of foot-piece at widest point
Breadth of heel ..	Add $^{1}/_{2}$ in.	= Breadth offoo t-piece at heel

Upper-limb abduction splint

This was designed for ease of manufacture and comfort in wearing both when in bed or when ambulatory. The framework is made from duralumin, mild steel, or brass rod of a gauge of $^{5}/_{16}$ in. for large splints and proportionately smaller gauge for small splints.

The frame is covered throughout with leather and padded in its vertical component and at the waist. A canvas bodice with shoulder-straps is sewn on to the posterior part of the chest-piece and fastened with two buckles and straps. The shoulder-straps are adjustable with buckles sewn on the front of the bodice. The bodice is cut away under the axilla to prevent chafing.

The width of the splint averages 3 in. for a medium-sized child aged 3–5 years, and 4–5 in. for adults. The width is the same from the hand to the crest of the ilium, where the splint broadens out to encompass nearly half the girth at the waist. The waist-piece is curved in two dimensions to fit round the waist and follow the curve of the crest of the ilium. It is about 2 in. wide and is well padded. The hand-piece is about 1 in. wider and is padded to give a comfortable grip.

MEASUREMENTS

Measurements are given for the frame only, since it found that measurements for the bodice were best taken the tailor who could then ensure a perfect fit.

From posterior axillary fold, or middle of the head of the humerus, to the tip of the olecranon	Add $^{1}/_{2}$ in.	= Length of outer or terior rod of arm tion
From axilla to crest of ilium	Add $^{1}/_{2}$ in.	= Length of vertical and length of oute of forearm portio
Half the girth at waist ..	Divide by 2	= Length of waist-piec

Bradford frame

The metal frame (fig. 4) is made from mild steel tu with an internal diameter of $^{1}/_{2}$–$^{3}/_{4}$ in. and painted or spr with aluminium paint. It is rectangular, with rour corners.

The frame is supported on two wooden blocks 4 in. and hollowed out to reduce weight. The frame fits grooves in the blocks and is held down with metal st The frames are covered by two canvas slings, laced un neath; a gap of 4–6 in. is allowed between the two canv to prevent soiling and to allow the use of a bedpan.

Where double gutter splints are required the lower car can be dispensed with, a wooden bar being fixed across frame to support the splints under the thigh-pieces (fig.

MEASUREMENTS

From vertex to sole of heel ..	Add 4 in.	= Length of frame
From vertex to coccyx ..	Add 2 in.	= Length of upper can
Breadth between posterior axillary folds (or middle of the heads of the humeri)		= Width of frame, ov or external meas ment
Length of lower canvas ..		= Length of frame, length of upper can less 4–6 in.

PENICILLIN FOR GONORRHŒA IN THE FEMALE

W. Neville Mascall
M.R.C.S.
DIRECTOR, L.C.C. (ENDELL STREET) CLINIC

In the past gonorrhœa in the female has seld received the attention which it deserves from the medi profession; and in recent years the introduction of n and effective remedies has detracted from an inter which was never strong, for there is a tendency to as that these infections are easily cured and are not acco panied by serious after-effects. There is still no genu recognition of the fact that this is a most damag complaint, with far-reaching consequences, unless trea skilfully in its early stages. What Thomson said 1923 is still true: "Until this state of affairs is remedi and the treatment of both acute and latent gonorrh in the female is taken up seriously by the profession, incidence, which is already large, will undoubte increase, and the gonococcus will continue to be resp sible for a large proportion (some put it as high as 50 of the tubo-ovarian and other pelvic conditions wh are seen in gynæcological wards, and for a great amo of the chronic ill health from which so many wo suffer."

The discovery that penicillin is remarkably effect in producing clinical cure of gonorrhœa marks an adva in treatment, but there are dangers in the wave of ov optimism that has followed the wide publicity given enthusiastic reports. General release of penicillin the market may lead to its indiscriminate use and g rise to a sense of false security, with disastrous c sequences. Some patients are inclined to look on gon rhœa like a mere cold, to be thrown off in no time the aid of a single injection. A large percentage those treated with penicillin do not complete the of observation and tests of cure.

As examples of the optimistic view one may Marshall (1945):

> "With a dosage of 100,000 units and upwards, in four five separated injections

rapid clinical cure of 90% of cases of uncomplicated and ulphonamide-resistant gonorrhœa can be confidently xpected.”

Ministry of Health circular says:

hus a single injection of 200,000 units (penicillin in oil) as been sufficient to effect apparent cure in over 90% f cases of acute gonorrhœa.”

illcox (1946) records that, during a recent visit to nited States, “It was an often-expressed view that rrhœa was beaten: and, though there were isolated s urging maintained caution, there was an increas- endency to relax the severity of the tests of cure in isease.”

cording to Willcox, J. F. Mahoney gave 200,000 s of an aqueous solution of penicillin in five doses to patients; and, apart from instructing the patient btain a blood-test in three months' time, there no tests of cure.

assessing cure of gonorrhœa in females there is e evidence of caution, for general examinations have conducted once a month for three months in some tres. Yet, in a very large clinic in Chicago, cultures smears after three days constituted the only follow-up ses of clinical cure, apart from monthly blood-tests three months.

ll these facts indicate an attitude of mind which must regarded as dangerous, having regard to the past ry of this perplexing and insidious disease. Methods treatment have changed quickly, but the character a disease changes slowly, and there is no reason yet ppose that gonorrhœa has lost its predilection ections latency.

he example of the sulphonamides is still before us, it may be well to learn caution from consideration the recent past.

okkinis (1939) claimed that 77% of cases of gonorrhœa ated with sulphonamides in the second week of the ction were cured, with a late relapse-rate of 9%. (1939) claimed that with sulphapyridine in over of 300 cases signs and symptoms had disappeared in than three weeks. Laird (1942), using various emes of dosage in 764 cases, obtained very similar lts with sulphonamides, with a success in each series ing from 81 to 91%.

ater came a very different report. Campbell (1944) ted out that in Sicily and Italy, from the very first, honamides were relatively ineffective. Whereas, until time, 65–70% of patients had recovered completely hatever initial course of sulphapyridine or sulpha- zole had been given, the percentage had dropped at to considerably less than 20. Under the very conditions, and with the employment of an increased ge of drugs, such as sulphathiazole and the small able supply of sulphadiazine, success resulted in not than 45%. The remaining 55% had continued to gonococci after treatment, and these persisted for a long time.

rness (1944) attributed this state of affairs to g resistance.” He thought that three potential rs were involved—faulty dosage; indiscretions of patient: and previous administration of the drug.

t that time I urged that the indiscriminate use of honamides for minor ailments was likely to lead cline in the efficiency of these drugs, and I recorded pression that there was an increase in the number gonococcal carriers.” It has seemed recently that y may be repeating itself, since my results with illin in gonorrhœa were less favourable, in female ents at any rate.

t has long been known that the assessment of the lts of treatment of gonorrhœa in the female presents difficulties; and the experienced clinician demands onsiderable period of observation and many tests re reaching a decision about cure.

In view of these considerations I have analysed 39 consecutive cases of gonorrhœa in the female which have recently been under observation at the L.C.C. (Whitechapel) Clinic. The table gives the results of this analysis, and it will be seen that in no less than 18 of the 39 cases the results were unsatisfactory, and that in a further

POSITIVE FINDINGS AFTER TREATMENT

Case	Diagnosis	Units of penicillin given	Smears	Cultures
1	S and G1	2,400,000 (div.)	..	..
2	S and G1	2,400,000 (div.)	U+, C+	..
3	S and G2	2,400,000 (div.)	U+	..
4	S and G1	2,400,000 (div.)	U+, C+*	..
5	S and G2	2,400,000 (div.)	..	..
6	S and G2	2,400,000 (div.)	..	..
7	S and G1	2,400,000 (div.)	..	..
8	S and G1	2,400,000 (div.)	..	C+
9	S and G1	2,400,000 (div.)	C+	..
10	S and G1	2,400,000 (div.)	..	..
11	S and G1	2,400,000 (div.)	..	..
12	S and G2	2,400,000 (div.)	..	..
13	G1	300,000 (div.)	C+	C+
14	G3	300,000 (div.)	U+, C+	..
15	G2	150,000 (div.)	U+, C+	U+, V+, C+
16	G1	150,000 (div.)	..	..
17	G vulvo-vaginitis	150,000 (div.)	U+, V+†	..
18	G vulvo-vaginitis	150,000 (div.)	U+, V+‡	..
19	G3	150,000 (div.)	§	..
20	G2	150,000 (div.)	..	C+
21	G1	200,000 (water)	..	..
22	G3	200,000 (water)	C+	V+
23	G3	200,000 (water)	U+	..
24	G1	200,000 (water)	..	V+
25	G1	200,000 (oil)	U+, C+	U+, V+, C+
26	G1	200,000 (oil)	U+	..
27	G vulvo-vaginitis	200,000 (oil)	U+	..
28	G1	200,000 (oil)	..	..
29	G3	200,000 (oil)	..	..
30	G1	200,000 (oil)	‖	U+, V+
31	G1	200,000 (oil)	C+	..
32	G1	200,000 (oil)	..	..
33	G3	200,000 (oil)	C+	..
34	G3	150,000 (oil)	..	..
35	G3	200,000 (oil)	..	V+
36	G3	200,000 (oil)	..	..
37	G1	200,000 (oil)	C+	..
38	G2	200,000 (oil)	C+	U+, V+, C+
39	G1	200,000 (oil)	C+	..

+ = extracellular gram-negative diplococci.
div. = penicillin given in divided dosage; in all other cases penicillin was given in a single injection.
S, syphilis.
G1, gonorrhœa with treatment less than 2 weeks after infection.
G2, gonorrhœa with treatment 2–4 weeks after infection.
G3, gonorrhœa with treatment 4–52 weeks after infection.
U, urethra. V, vagina. C, cervix.
* Additional 200,000 units in oil given—still U+.
† Still + after 300,000 (div.) and after 250,000 (oil); treated successfully with sulphadiazine.
‡ Sulphadiazine and menformon given with successful result.
§ Still + after 200,000 (oil) and 300,000 (oil).
‖ Developed gonococcal bartholinitis after penicillin.

thus there is a round opening behind the knee. Two slots, 1 in. × $^1/_4$ in., are cut one on each side, $^1/_4$ in. from the lateral margin and 1 in. from the proximal end.

The thigh- and calf-pieces are joined at an angle of 15°, so that the foot-piece and the upper end of the thigh-piece both rested on the bed, with the contained limb in a comfortable position.

Calf-piece.—Unless it is for a short splint a half-circle is cut in the proximal edge, corresponding with that in the thigh-piece. Two slots are cut in the upper end similar to those in the thigh-piece, and two slots in the lower end set obliquely at 45° across the corners. The lower edge, and for a short splint the upper also, is moulded outwards to prevent chafing.

Foot-piece.—Shaped roughly like the sole of a boot. Two slots, 1 in. × $^1/_4$ in., cut one on each side, halfway along the length and $^1/_4$ in. from the edges.

Connecting L-piece.—Width $^1/_2$–1 in. according to size of splint. The straight portions of the L are riveted to the calf-piece for half its length and to the foot-piece for the whole of its length. There is a wide U-bend, 1$^1/_2$–3 in. wide and deep, at the angle of the L, to accommodate the heel. A $^3/_8$ in. screw is riveted into the curve of the U to fit into the slot in the cross-bar.

Cross-bar.—For a single splint this consists of a straight strip 2–3 × 6–8 in. A hole is drilled in the centre to take the screw mentioned above. The bar is turned at right angles along its edges for greater strength.

The cross-bar for a double splint is curved, the curve being the quadrant of a circle of radius equal to the length of the lower limb. Slots are cut in the bar to allow variation in the degree of abduction.

MEASUREMENTS

The measurements supplied to the instrument-maker are body measurements, from which he works out the splint measurements as described below. The calculations are accurate for average-sized splints, and certain obvious allowances must be made for very large or small splints. The measurements of width for the thigh- and calf-pieces are on the flat before bending into an arc slightly wider than a semicircle.

Great trochanter to external condyle of knee	Subtract 3 in.	= Length of outer edge of thigh-piece
External condyle of knee to sole of foot	Subtract 2 in.	= Length of calf-piece for long splint
	Subtract 4 in.	= Length of calf-piece for short splint
Girth of thigh at groin..	Divide by 2	= Breadth of thigh-piece at upper end
Girth at knee	Divide by 2	= Breadth of thigh-piece at lower end, and breadth of calf-piece at upper end
Girth above malleoli ..	Divide by 2	= Breadth of calf-piece at lower end
Length of foot, heel to great toe	Add 2 in.	= Length of foot-piece
Breadth of forefoot ..	Add $^1/_2$ in.	= Breadth of foot-piece at widest point
Breadth of heel ..	Add $^1/_2$ in.	= Breadth offoo t-piece at heel

Upper-limb abduction splint

This was designed for ease of manufacture and comfort in wearing both when in bed or when ambulatory. The framework is made from duralumin, mild steel, or brass rod of a gauge of $^5/_{16}$ in. for large splints and proportionately smaller gauge for small splints.

The frame is covered throughout with leather and padded in its vertical component and at the waist. A canvas bodice with shoulder-straps is sewn on to the posterior part of the chest-piece and fastened with two buckles and straps. The shoulder-straps are adjustable with buckles sewn on the front of the bodice. The bodice is cut away under the axilla to prevent chafing.

The width of the splint averages 3 in. for a medium-sized child aged 3–5 years, and 4–5 in. for adults. The width is the same from the hand to the crest of the ilium, where the splint broadens out to encompass nearly half the girth at the waist. The waist-piece is curved in two dimensions to fit round the waist and follow the curve of the crest of the ilium. It is about 2 in. wide and is well padded. The hand-piece is about 1 in. wider and is padded to give a comfortable grip.

MEASUREMENTS

Measurements are given for the frame only, since it found that measurements for the bodice were best take the tailor who could then ensure a perfect fit.

From posterior axillary fold, or middle of the head of the humerus, to the tip of the olecranon	Add $^1/_4$ in.	= Length of outer or terior rod of arm tion
From axilla to crest of ilium	Add $^1/_2$ in.	= Length of vertical and length of oute of forearm portio
Half the girth at waist ..	Divide by 2	= Length of waist-piec

Bradford frame

The metal frame (fig. 4) is made from mild steel tu with an internal diameter of $^1/_2$–$^3/_4$ in. and painted or spr with aluminium paint. It is rectangular, with rou corners.

The frame is supported on two wooden blocks 4 in. and hollowed out to reduce weight. The frame fits grooves in the blocks and is held down with metal st The frames are covered by two canvas slings, laced un neath; a gap of 4–6 in. is allowed between the two canv to prevent soiling and to allow the use of a bedpan.

Where double gutter splints are required the lower can can be dispensed with, a wooden bar being fixed across frame to support the splints under the thigh-pieces (fig.

MEASUREMENTS

From vertex to sole of heel..	Add 4 in.	= Length of frame
From vertex to coccyx ..	Add 2 in.	= Length of upper can
Breadth between posterior axillary folds (or middle of the heads of the humeri)		= Width of frame, ov or external meas ment
Length of lower canvas ..		= Length of frame, length of upper can less 4–6 in.

PENICILLIN FOR GONORRHŒA IN THE FEMALE

W. NEVILLE MASCALL
M.R.C.S.
DIRECTOR, L.C.C. (ENDELL STREET) CLINIC

IN the past gonorrhœa in the female has seld received the attention which it deserves from the medi profession; and in recent years the introduction of n and effective remedies has detracted from an inter which was never strong, for there is a tendency to assu that these infections are easily cured and are not acco panied by serious after-effects. There is still no gen recognition of the fact that this is a most damag complaint, with far-reaching consequences, unless trea skilfully in its early stages. What Thomson said 1923 is still true: "Until this state of affairs is remedi and the treatment of both acute and latent gonorrh in the female is taken up seriously by the profession, incidence, which is already large, will undoubte increase, and the gonococcus will continue to be resp sible for a large proportion (some put it as high as 50 of the tubo-ovarian and other pelvic conditions wh are seen in gynæcological wards, and for a great amo of the chronic ill health from which so many wo suffer."

The discovery that penicillin is remarkably effect in producing clinical cure of gonorrhœa marks an adva in treatment, but there are dangers in the wave of o optimism that has followed the wide publicity given enthusiastic reports. General release of penicillin the market may lead to its indiscriminate use and g rise to a sense of false security, with disastrous c sequences. Some patients are inclined to look on gon rhœa like a mere cold, to be thrown off in no time the aid of a single injection. A large percentage those treated with penicillin do not complete the co of observation and tests of cure.

As examples of the optimistic view one may qu Marshall (1945):

> "With a dosage of 100,000 units and upwards, in four five separated injections over eight to twelve ho

a rapid clinical cure of 90% of cases of uncomplicated and sulphonamide-resistant gonorrhœa can be confidently expected."

A Ministry of Health circular says :

> Thus a single injection of 200,000 units (penicillin in oil) has been sufficient to effect apparent cure in over 90% of cases of acute gonorrhœa."

Willcox (1946) records that, during a recent visit to United States, "It was an often-expressed view that orrhœa was beaten ; and, though there were isolated ces urging maintained caution, there was an increas- tendency to relax the severity of the tests of cure in disease."

According to Willcox, J. F. Mahoney gave 200,000 its of an aqueous solution of penicillin in five doses to le patients ; and, apart from instructing the patient obtain a blood-test in three months' time, there re no tests of cure.

In assessing cure of gonorrhœa in females there is re evidence of caution, for general examinations have n conducted once a month for three months in some ntres. Yet, in a very large clinic in Chicago, cultures nd smears after three days constituted the only follow-up cases of clinical cure, apart from monthly blood-tests r three months.

All these facts indicate an attitude of mind which must e regarded as dangerous, having regard to the past istory of this perplexing and insidious disease. Methods f treatment have changed quickly, but the character a disease changes slowly, and there is no reason yet suppose that gonorrhœa has lost its predilection r infectious latency.

The example of the sulphonamides is still before us, d it may be well to learn caution from consideration the recent past.

Cokkinis (1939) claimed that 77% of cases of gonorrhœa eated with sulphonamides in the second week of the ection were cured, with a late relapse-rate of 9%. (1939) claimed that with sulphapyridine in over % of 300 cases signs and symptoms had disappeared in than three weeks. Laird (1942), using various hemes of dosage in 764 cases, obtained very similar ults with sulphonamides, with a success in each series ging from 81 to 91%.

Later came a very different report. Campbell (1944) inted out that in Sicily and Italy, from the very first, phonamides were relatively ineffective. Whereas, until t time, 65–70% of patients had recovered completely whatever initial course of sulphapyridine or sulpha- zole had been given, the percentage had dropped at e to considerably less than 20. Under the very conditions, and with the employment of an increased age of drugs, such as sulphathiazole and the small lable supply of sulphadiazine, success resulted in not than 45%. The remaining 55% had continued to gonococci after treatment, and these persisted for a long time.

arkness (1944) attributed this state of affairs to ug resistance." He thought that three potential ors were involved—faulty dosage ; indiscretions of patient ; and previous administration of the drug.

t that time I urged that the indiscriminate use of honamides for minor ailments was likely to lead ecline in the efficiency of these drugs, and I recorded mpression that there was an increase in the number gonococcal carriers." It has seemed recently that ory may be repeating itself, since my results with illin in gonorrhœa were less favourable, in female ents at any rate.

has long been known that the assessment of the s of treatment of gonorrhœa in the female presents difficulties ; and the experienced clinician demands nsiderable period of observation and many tests re reaching a decision about cure.

In view of these considerations I have analysed 39 consecutive cases of gonorrhœa in the female which have recently been under observation at the L.C.C. (Whitechapel) Clinic. The table gives the results of this analysis, and it will be seen that in no less than 18 of the 39 cases the results were unsatisfactory, and that in a further

POSITIVE FINDINGS AFTER TREATMENT

Case	Diagnosis	Units of penicillin given	Smears	Cultures
1	S and G1	2,400,000 (div.)	..	..
2	S and G1	2,400,000 (div.)	U +, C +	..
3	S and G2	2,400,000 (div.)	U +	..
4	S and G1	2,400,000 (div.)	U +, C +*	..
5	S and G2	2,400,000 (div.)	..	..
6	S and G2	2,400,000 (div.)	..	..
7	S and G1	2,400,000 (div.)	..	..
8	S and G1	2,400,000 (div.)	..	C +
9	S and G1	2,400,000 (div.)	C +	..
10	S and G1	2,400,000 (div.)	..	..
11	S and G1	2,400,000 (div.)	..	..
12	S and G2	2,400,000 (div.)	..	..
13	G1	300,000 (div.)	C +	C +
14	G3	300,000 (div.)	U +, C +	..
15	G2	150,000 (div.)	U +, C +	U +, V +, C +
16	G1	150,000 (div.)	..	..
17	G vulvo-vaginitis	150,000 (div.)	U +, V +†	..
18	G vulvo-vaginitis	150,000 (div.)	U +, V +‡	..
19	G3	150,000 (div.)	§	..
20	G2	150,000 (div.)	..	C +
21	G1	200,000 (water)	..	..
22	G3	200,000 (water)	C +	V +
23	G3	200,000 (water)	U +	..
24	G1	200,000 (water)	..	V +
25	G1	200,000 (oil)	U +, C +	U +, V +, C +
26	G1	200,000 (oil)	U +	..
27	G vulvo-vaginitis	200,000 (oil)	U +	..
28	G1	200,000 (oil)	..	..
29	G3	200,000 (oil)	..	..
30	G1	200,000 (oil)	‖	U +, V +
31	G1	200,000 (oil)	C +	..
32	G1	200,000 (oil)	..	..
33	G3	200,000 (oil)	C +	..
34	G3	150,000 (oil)	..	..
35	G3	200,000 (oil)	..	V +
36	G3	200,000 (oil)	..	..
37	G1	200,000 (oil)	C +	..
38	G2	200,000 (oil)	C +	U +, V +, C +
39	G1	200,000 (oil)	C +	..

+ = extracellular gram-negative diplococci.
div. = penicillin given in divided dosage ; in all other cases penicillin was given in a single injection.
S, syphilis.
G1, gonorrhœa with treatment less than 2 weeks after infection.
G2, gonorrhœa with treatment 2–4 weeks after infection.
G3, gonorrhœa with treatment 4–52 weeks after infection.
U, urethra. V, vagina. C, cervix.
* Additional 200,000 units in oil given—still U +.
† Still + after 300,000 (div.) and after 250,000 (oil) ; treated successfully with sulphadiazine.
‡ Sulphadiazine and menformon given with successful result.
§ Still + after 200,000 (oil) and 300,000 (*oil*).
‖ Developed gonococcal bartholinitis after penicillin.

16 cases there was evidence of probable failure. In the table the cases are grouped according to the scheme of treatment used.

ADMINISTRATION OF PENICILLIN

Four different schemes of dosage were used:

(1) Multiple injections of an aqueous solution—five doses of 30,000 units two-hourly, totalling 150,000 units, or five doses of 60,000 units two-hourly, totalling 300,000 units.
(2) Single injection of 200,000 units in aqueous solution.
(3) Single injection of 150,000 or 200,000 units in arachis oil and beeswax.
(4) Inpatients, with syphilis also, were given sixty injections, each of 40,000 units at three-hourly intervals, totalling 2,400,000 units.

All penicillin was kept in the refrigerator. The aqueous solution was made up fresh for each injection. The syringes used were sterilised by boiling, and no antiseptics were employed.

TESTS USED

(1) Smears were taken from the urethra and cervical canal and stained by a modification of Gram's stain. In the table certain smears are marked +; these specimens were reported as doubtful, which implies gram-negative *extracellular* diplococci, in all other respects morphologically *indistinguishable from gonococci.*
(2) For cultures, material from the urethra, the posterior fornix of the vagina, and the cervical canal was inoculated onto Price's serum agar (pH 7·5–7·6). The slopes used for the urethra and cervical canal and the plate used for the posterior fornix of the vagina were warmed to 37° C in an incubator before use and were immediately returned to the incubator after inoculation. This technique is essential if the gonococci are to be grown successfully.

CASE ANALYSIS

Of the 39 patients 12 had gonorrhœa and syphilis and were admitted to hospital, where they received 2,400,000 units of penicillin in sixty injections of 40,000 units at three-hourly intervals. Of these 12 patients 5 showed signs of active gonorrhœa, with positive tests, after discharge from hospital. One of these patients received a further injection of 200,000 units of penicillin in arachis oil and beeswax, and still showed extracellular gram-negative diplococci.

The series included 3 children with vulvovaginitis. In our experience this type of case has not responded well to penicillin, and Dr. F. R. Curtis has reported (in a personal communication) similar experience in treating children in Germany. In this respect case 17 is of much interest. This was a child, aged 4 years, who first received 16 g. of sulphathiazole, with improvement, followed by a clinical and bacteriological relapse. Penicillin 150,000 units was then given in divided dosage; tests were again positive, and this was followed by 300,000 units of penicillin in divided dosage. Tests were still positive, and the child was given a further single injection of 250,000 units in arachis oil and beeswax. Relapse took place again; so a course of sulphadiazine was given, with subsequent negative findings. All other members of the family were examined and found to be free from infection.

The other 2 cases of vulvovaginitis cleared with sulphonamides after unsuccessful treatment with penicillin. It is reasonable to suppose that such children become "gonococcal carriers," for there is often very little clinical evidence of the infection.

Case 30 is also of special interest, inasmuch as this patient developed a Bartholin abscess, from the pus of which gonococci were cultured, seven days after the administration of 200,000 units of penicillin in arachis

RELAPSE OR REINFECTION

The problem of whether a case is one of true re
or of reinfection is commonly insoluble. Often this i
question of the patient's word, and there are no
standards of reliability.

In every case in this series the patient was closely c
examined about the possibility of reinfection. I inte
to exclude any case in which there was the least sh
of doubt regarding reinfection; but the occasion did
arise.

Several of the patients with double infection
examined on the day of leaving hospital, or next day.

COMMENT

Reports have been published claiming 90% or more
successes in removing gonococci from the secretions
in resolving the clinical signs of gonorrhœa
present small series of cases does not confirm thes
ings and, in the mind of the careful clinician, wi
even greater doubt about the bacteriological c
patients treated in this way.

Now that penicillin is available generally to all
tioners, a word of warning may be given agai
indiscriminate use. It will be unfortunate if p
with vaginal discharge are treated with penicillin w
proper investigation, as they sometimes have bee
the sulphonamides. It should be remembered
Trichomonas vaginalis, monilia yeasts, and some
organisms which give rise to an abnormal vagina
do not respond to penicillin. The gonococcus ma
be present in these cases, and this fact may be ob
by treatment without preliminary diagnosis.

Three points seem to be essential for successful pe
therapy: a correct diagnosis, an adequate dos
penicillin, and a prolonged period of observation
treatment. Far from any relaxation of the tests o
for gonorrhœa, more care in observation and tests
treatment should be the rule. This should be sim
by the fact that it is important to keep these pa
who have been treated with penicillin, under ob
tion for at least six months, to be certain that a coe
syphilitic infection has not been suppressed b
administration of the penicillin.

It is possible that our present dosage of penicill
gonorrhœa is inadequate, and that it is only suf
to induce latency in some cases. However, the ca
which 2,400,000 units of penicillin were given wi
success suggest the possibility that some stra
gonococci are naturally resistant or have acq
resistance.

Vulvovaginitis has been always a difficult con
to treat, and it does not appear that the ideal met
treatment has been discovered yet.

SUMMARY

Of 39 females with gonorrhœa treated with peni
in amounts generally considered more than ade
24 did not respond to the treatment.

Tests showed positive or doubtful findings in
smears or cultures, or both, at a period of not less
seven days after the start of treatment.

In 3 patients tests were still positive after treat
with increased dosage of penicillin.

I wish to thank Mr. Ambrose King, F.R.C.S., director
L.C.C. (Whitechapel) Clinic, for his helpful coöperation.

REFERENCES

Campbell, D. J. (1944) see *Brit. J. vener. Dis.* 20, 104.
Cokkinis, A. J. (1939) see *Ibid*, 15, 117.
Harkness, A. H. (1944) *Ibid*, 20, 9.
King, A. J. (1939) see *Ibid*, 15, 106.
Laird, S. M. (1942) *Lancet*, i, 463.
Marshall, J. (1945) *Brit. J. vener. Dis.* 21, 150.
Thomson, D. (1923) *Gonorrhœa*, London, p. 403.
Willcox, R. R. (1946) in an address to the Medical Society f
Study of Venereal *Diseases.*

EPIDEMIC KERATO-CONJUNCTIVITIS IN BENGAL

THE INCUBATION PERIOD

B. THORNE THORNE
M.B. Camb., M.R.C.P., D.O. Oxfd
ASSISTANT SURGEON, SUSSEX EYE HOSPITAL; FORMERLY OPHTHALMIC SPECIALIST, R.A.F.V.R.

IN September, 1944, and in September, 1945, outbreaks of epidemic kerato-conjunctivitis occurred among Service personnel in the Calcutta area. In the 1944 series 10 cases were seen and treated at a Royal Air Force centre. One was severe and developed a tenonitis, and another case was complicated by iridocyclitis. This account deals with the series of 17 cases seen in September, 1945, at the same R.A.F. centre (see table). The patients were airmen who had all been playing football on muddy grounds in the Calcutta area, 8 patients came from one unit, 7 of whom played football on a very waterlogged ground on the same day, and for some of the players it was the only game in which they had recently taken part. Therefore the date of infection could be accurately determined, as could the date of onset of symptoms, and thus the incubation period. A considerable number of cases also occurred among Army personnel in the same area and at the same time, and these were treated at the Army hospital.

Symptoms.—The disease was characterised by an acute onset of pain and lacrimation in one eye, the usual story being that the man woke up in the morning with these symptoms, having retired to bed the previous night perfectly well. Only in 2 of the 17 cases had both eyes been involved. Examination showed intense conjunctival injection, swelling of the lids—mostly the outer two-thirds—and some chemosis of the lower palpebral conjunctiva. Lacrimation and photophobia were well marked, but a purulent discharge was rare. The keratitis was usually of the superficial punctate type, more often affecting the periphery, but sometimes it was generalised. In a few of the cases the subepithelial layers were involved, and in one the corneal infiltration was of the disciform variety. Corneal sensation was much diminished in all cases. Keratic precipitates were present in 3 cases (four eyes). Preauricular adenitis was a prominent feature and was present in all cases, and in some the submaxillary glands were involved. The glands were always painful and tender at the onset of the disease. The interval between the onset of symptoms and the presence of corneal changes was short, under seven days in all cases, and in many the keratitis was well marked when first seen only a day or two after the onset. History of trauma to the eye was obtained in only 2 cases.

Incubation Period.—This was between twelve and seventeen days, and in most cases this could be determined with accuracy. This period is longer than that suggested by Feigenbaum et al. (1945) and Sanders (1942) who put it at four or five days.

Infecting Agent.—This is thought to be a filtrable virus, and all conjunctival swabs when taken in these cases were negative. In Bengal, by September the monsoon season is more than half over, and the ground is soft and at times under water. The virus is thought to be present in the soil and to be transferred readily to the eyes of footballers playing on muddy grounds. The disease has been recognised in India for many years, particularly in the coastal districts (Kirkpatrick 1920).

Treatment.—It was soon realised that, apart from instillation of atropine and the wearing of dark glasses, other local treatment to the eye appeared to do more harm than good, except that the more severe cases were given a course of short-wave diathermy, and the impression gained was that it was of benefit. All patients were also given vitamins B and C by mouth.

Progress.—This varied with the severity of the case, and the period from the onset of symptoms to the time when the eye was quiet was from six days to three weeks. Visual acuity returned to normal or just below normal after a further period of three or four weeks, but corneal sensation took longer to recover.

SUMMARY

An outbreak of epidemic kerato-conjunctivitis in the Calcutta area is described.

The incubation period could be accurately determined in most cases, and was between twelve and seventeen days.

This is longer than that previously described.

I wish to thank the Director-General of Medical Services, R.A.F., for permission to publish this report.

REFERENCES

Feigenbaum, A., Michaelson, I. C., Kornblüth, W. (1945) *Brit. J. Ophthal.* 29, 389.
Kirkpatrick, H. (1920) *Ibid*, 4, 16
Sanders, M. (1942) *Arch. Ophthal.* 28, 581.

ase	Age (years)	Probable date of infection in 1945	Date of onset of symptoms	Incubation period (days)	Condition of eyes	Duration of disease until eye was quiet (days)
1	23	August 15	August 31	16	Well-marked superficial keratitis extending to subepithelial layer; K.P. present	21
2	27	August 17	Sept. 1	15	Superficial only; no K.P.	9
3	24	August 17	Sept. 1	15	Central, superficial; no K.P.	14
4	23	Not known	Sept. 4	?	Superficial only; no K.P.	6
5	22	August 17	August 30	13	Subepithelial, peripheral; no K.P.	16
6	24	August 17	Sept. 3	17	Superficial, peripheral; no K.P.	11
7	22	August 16	Sept. 1	16	ditto	11
8	24	August 17	August 30	13	ditto	15
9	31	August 17	August 30	13	Superficial peripherally, with central disciform keratitis; no K.P.	15
10	24	August 17	August 31	14	Generalised, superficial; no K.P.	—
11	23	August 21	Sept. 5	15	ditto	13
12	23	Early Sept.	Sept. 16	Under 15	Bilateral, generalised, superficial, both eyes; K.P. both eyes	20
13	23	Early Sept.	Sept. 16	Under 15	Generalised, superficial; no K.P.	16
14	37	Early Sept.	Sept. 16	Under 15	Generalised; K.P. present	16
15	23	Sept. 2	Rt. eye Sept. 14 Lt. eye Sept. 18	12 16	Generalised; no K.P.	Rt. eye 16 Lt. eye 12
16	25	Not known	Sept. 18	?	Peripheral; no K.P.	12
17	24	Not known	Sept. 24	?	ditto	16

K.P., keratic precipitates.

ry coöperative. Samples of twenty-four-hour urine re *collected daily, and fæces were collected twice* ekly for about six months. The urine was measured d examined for nicotinamide methochloride by the ethod of Coulson, Ellinger, and Holden.[13] The fæces re cooled in a refrigerator to about 2° C immediately ter having been passed. A sample was weighed out ualling about 25 mg. dry weight, and a suspension as made in 5 ml. of sterile peptone water and filtered rough a sterile paper filter. This filtrate was diluted : 40, and further serial dilutions of 1 : 10 were made in ptone water. In case 1 examinations were carried out ith the dilutions to determine quantity and types of aerobes growing aerobically and anaerobically on solid edia, and of gas- and acid-producers growing in litmus-ctose broth, types of anaerobes and anaerobic spore-earers growing in Brewer's medium and of acid-resistant erobes and anaerobes in acetic-acid-glucose broth; mears were examined from the original suspensions. n case 2 no solid media have been used, but in addition e total of living aerobic and anaerobic organisms was amined by titration, and aerobic and anaerobic spore-earers and acid-resisters were quantitatively estimated. n both cases the patients were given ambamide 1·5 g. three-hourly (12 g./day) for six days. The results are shown in table I.

The results show that during the ambamide dosing period there was an increase in the number of coliform bacteria growing on solid media in case 1; of bacteria growing in Brewer's medium and of total living organisms under aerobic and anaerobic conditions in case 2; and of gas- and acid-producers in both cases. The methods used up to now have not given satisfactory information about the total number of anaerobes, but anaerobic spore-bearers and anaerobic acid-resisters showed in case 2 a temporary reduction in numbers. The gas- and acid-producers which increased in number were three types of coliform bacteria, and the organisms growing in Brewer's medium were mainly diplo- and strepto-cocci. The anaerobic spore-bearers were mainly large gram-positive rods in pairs or chains; and the anaerobic acid-resisters gram-positive rods which produced acid and clots in milk.

TABLE I—BACTERIAL COUNTS AND OUTPUT OF NICOTINAMIDE METHOCHLORIDE BEFORE, DURING, AND AFTER DOSING WITH AMBAMIDE

—	Before dosing	Dosing period						After dosing	
		Days						Days	
		1	2	3	4	5	6	3	7
Case 1 C[illegible]orm bac- [illegible] on solid [illegible] ..	3	..	..	6	..	..	7	5	4
[illegible] and acid-producers in litmus-lactose broth ..	5	..	..	6	..	..	7	5	4
Nicotinamide methochloride (mg.)	3·58*	5·74	6·66	11·15	Lost	7·44	7·19	6·62*	4·70*
Case 2 [illegible] and acid-producers in litmus-lactose broth ..	2	..	..	(7)	..	..	9	8	6
Growth in Brewer's medium ..	3	..	..	(7)	..	..	8	7	6
[illegible]ore-bearers in [illegible]rewer's [illegible]edium ..	2	..	..	2	..	..	3	3	3
Total living [illegible]anisms: aerobic .. anaerobic ..	5 5	.. ..	.. ..	(7) (7)	.. ..	.. ..	9 9	7 7	6 6
Spore bearers: aerobic .. anaerobic ..	07 2	.. ..	.. ..	2 0	.. ..	.. ..	2 2	2 2	3 3
Acid-resisters: aerobic .. anaerobic ..	3 2	.. ..	.. ..	3 2	.. ..	.. ..	2 0	2 2	3 (5)
Nicotinamide methochloride (mg.)	2·90*	4·22	Lost	6·29	9·82	9·09	7·72	4·50*	3·33*

* The average of 3 days.

The numbers in the tables represent the serial numbers of the [illegible]t tubes containing microbes.

[illegible]he numbers in parentheses mean that the last tube examined [illegible]l contained microbes.

TABLE II—DAILY OUTPUT (µg.) OF NICOTINAMIDE METHOCHLORIDE IN RATS BEFORE, DURING, AND AFTER DOSING WITH AMBAMIDE

Rat no.	Before dosing (average 3 days)	Dosing period				After dosing		
		Days				*Days*		
		1	2	3	4	1	2	3
1	38·8	13·5	21·3	107·8	196·7	236·0	14·6	38·8
2	31·4	60·6	124·0	318·0	373·9	449·0	242·0	101·2
3	42·7	28·2	46·8	202·1	273·8	298·2	117·0	56·8
4	86·2	90·7	160·3	311·2	412·8	498·1	217·2	113·6
5	741·0	414·3	418·7	824·0	723·0	587·0	689·7	875·0
6	1104·0	334·0	594·2	1792·0	2120·0	772·0	774·0	Lost

After the treatment with ambamide had been stopped, the bacteria and the output of nicotinamide methochloride returned slowly to their previous levels, except the acid-resisting anaerobes, which rose to a considerably higher level.

EXPERIMENTAL RESULTS IN RATS

In another experiment the effect of ambamide on the output of nicotinamide methochloride in rats was examined, but the bacterial content of the fæces was not examined. Adult rats were put on a mixed diet, and the daily urinary output of nicotinamide methochloride was estimated before, during, and after administration of ambamide. Each rat received ambamide 2·25 g. a day in its food for four days. Four of the rats had a low output of less than 100 µg., and two a high output of more than 500 µg., of nicotinamide methochloride before being given ambamide. The results are shown in table II, which shows, after a temporary depression in some instances, a considerable rise in output of nicotinamide methochloride in all but one rat (no. 5) during and immediately after the period of dosing with ambamide.

DISCUSSION

The chief results of the experiments are the increased output of nicotinamide methochloride and the increase of the coliform intestinal flora during the period of dosing with ambamide. These coliform bacteria can produce nicotinamide in vitro.[14] Whether this increase of the coliform flora is due to a direct stimulating effect of ambamide or to a destruction of anaerobes enabling increase of the coliforms cannot be concluded from the present experiments and must be examined further. No information can be obtained about the total numbers of anaerobes with the methods used so far, since most of the aerobes are facultative anaerobes and appear also in the anaerobic cultures. The increased output of nicotinamide methochloride may be due to the increase of nicotinamide-producing coliforms alone or to the simultaneous decrease in nicotinamide-consuming or nicotinamide-destroying anaerobes.

1[illegible]. Coulson, R. A., Ellinger, P., Holden, M. *Biochem. J.* 1944, 38, 150.

14. Ellinger, P., Kader, M. M. 1945, unpublished.

The complete experiments will be reported in detail later. They show distinctly that the ingestion of ambamide increases simultaneously the numbers of coliform bacteria, which are known to synthesise and release nicotinamide, and the elimination of nicotinamide methochloride in the urine. This is further evidence for the conclusion that human nicotinamide requirements are partly covered by the release of this compound by the intestinal flora.

We are deeply indebted to the late Dr. H. Schütze for advice and supervision of the bacteriological work.

Our thanks are due to Dr. G. A. Caldwell for permission to carry out the investigation at West Park Hospital, Epsom; Drs. S. W. Hardwick and W. P. Berrington for the clinical care of the subjects; the nursing staff of West Park Hospital for the careful collection of the specimens; Miss D. Garner for technical assistance; and Messrs. R. F. Reed Ltd., of Barking, for ambamide tablets. The work was carried out with a grant from the Medical Research Council (personal grant for A. E. and grant for technical assistance and expenses).

Addendum.—Since this paper was submitted two more people have been treated with ambamide and the fæcal bacteria and the urinary output of nicotinamide methochloride examined. In one person conditions were similar to those reported. In the other the rise in coli and nicotinamide methochloride occurred only after a temporary depression similar to that observed in rats.

P. ELLINGER
Dr. med. Heidelberg, Dr. phil. Greifswald, F.R.I.C.
A. EMMANUELOWA
M.D. St. Petersburg.
Lister Institute of Preventive Medicine, London.

Reviews of Books

Physics for the Anæsthetist

R. R. MACINTOSH, M.A., D.M. Oxfd, F.R.C.S.E., D.A., Nuffield professor of anæsthetics, University of Oxford; WILLIAM W. MUSHIN, M.A., M.B. Lond., D.A., first assistant in the department. Oxford: Blackwell Scientific Publications. Pp. 235. 30*s.*

KNOWLEDGE of the basic sciences, clinical acumen, and technical skill are the requisites of the trained anæsthetist. Extensive theoretical knowledge without the power of clinical application is of little value. Many anæsthetists, however, are technically very dexterous and yet do not know or are incurious about the meaning of everyday observations. The authors of this book have picked out the relevant physical laws and fully expounded their application to anæsthetic practice. Among other things, they discuss the structure of matter and the properties of gases and vapours; why cylinders of nitrous oxide freeze up; how the modern anæsthetic apparatus has developed; the working principles of the various meters for measuring gases; the causes of heat-loss through the respiratory tract; atmospheric pressure and the results of increased and decreased pressure; gas-cylinder pressures; the importance of turbulence and resistance in the design and use of anæsthetic equipment; the rationale for the use of helium-oxygen mixtures; aero-embolism and intravenous infusions; and the effects on the circulatory, renal, and respiratory functions of osmosis, diffusion, and filtration. Useful tables of physical data and a short biographical study are included, and the work is fully and admirably illustrated by Miss M. McLarty.

Physics for the Anæsthetist fills a want long felt by anæsthetists both old and young. It may also be recommended to the preclinical student, who will find his first year's work far more interesting if he appreciates the application it will have later.

Medical Uses of Soap

Editor: MORRIS FISHBEIN, M.D. London: J. B. Lippincott. Pp. 182. 18*s.*

THIS instructive volume, dealing with soap and many of its effects upon the skin, has been compiled by a group of experts. The chemistry of soap and its usual method of manufacture is clearly and briefly explained, and a slight knowledge of the different varieti
certainly useful to those who may have to deal with
of the ill effects produced by soap. The action of
in cleansing is, as is well known, brought about by
removal of the dirt-impregnated horny layer,
being more efficient for this purpose than acid.
stressed, however, that too thorough removal
natural covering of the skin tends to deprive it of
of its essential protectiveness. To a certain extent
soap is germicidal—but unfortunately only
germicidal for staphylococci. However thor
scrubbing with soap and water may be carried
bacterial flora cannot be completely removed fro
skin; but in the prevention of syphilis the imm
use of soap and water is probably far more valuabl
many of the other prophylactic measures freq
advised.

In cases of dermatitis due to soap, direct dam
the skin is the most important factor, but softening
skin by the alkaline action of soap may often prepa
way for secondary infections. In treating disea
the skin the question whether to withhold soap
water or not is sometimes difficult to answer, an
authors discuss the problem fairly fully. Ther
useful sections on the use of soap in industry, ar
shampooing and shaving, and the use of sulpho
oils as cleansers is also considered.

Modern Treatment Year Book 1946

Editor: Sir CECIL WAKELEY, D.SC., F.R.C.S.,
surgeon, King's College Hospital, London. Lo
Medical Press and Circular. Pp. 326. 15*s.*

THIS latest volume, the twelfth in the series,
true to type—a miscellany from which the practi
will glean many a useful tip. It is refreshing in these
of "scientific" medicine to find an exposition of h
cure warts in children by "charming," and the s
on the treatment of migraine is wonderfully compr
sive. Post-war difficulties are probably responsibl
the rather large number of misprints. This is not a
reference book, but its 37 chapters are a useful guid
the general practitioner to the intricacies of m
medicine.

Die Grundlagen unserer Ernährung und un Stoffwechsels

(5th ed.) EMIL ABDERHALDEN, professor in the Univ
of Zurich. *Berne: Huber. Pp. 202. Sw. fr. 8.50.*

THE first edition of this book appeared during the
world war and became well known in Germany i
years which followed when nutrition was upperm
many German minds. Abderhalden kept the book
date, in spite of his other activities, all the time he
the chair at Halle. Whatever his political views,
have been, the close of the second world war foun
still at Halle, but he has now accepted a chair at Z
and there, in what must be his old age, he has pre
a fifth edition of his little book.

It is not often easy for a man with an encyclo
mind to write an elementary book; but if he can
himself to do so the result may be very good, and has
so in this instance. This book is simply written, b
the whole still up to date, showing a balance lacki
many English and American books of similar ca
There are good chapters on the parts played by plant
animals in the economy of nature, the various
stuffs, water, minerals and vitamins, digestion
cellular metabolism, and quantitative requirem
(though this chapter does not reach the standard o
others). Protein requirements should nowaday
considered in terms of amino-acid requirements;
more might have been said about the value of plant
animal proteins in human nutrition: in Germany t
there is a tendency to believe that only animal pr
has any virtue at all. The addendum on the
question is rather weak: the author sets himself f
on the fence—which is quite permissible if he find
seat comfortable—but the only evidence discussed
to do with the amount of B_1 in flours of various extrac
Nevertheless there are some delightful little points
here and there in this book, and it may be recomme
safely to anyone who wants a good introduction to
subject of nutrition.

ANAHÆMIN B.D.H.

THE ERYTHROPOIETIC FRACTION OF LIVER

Described by Dakin and West

The principal indication for Anahæmin B.D.H. is the treatment of pernicious anæmia. It is highly effective also in preventing the onset of subacute combined degeneration of the cord as well as in correcting all the remediable symptoms of this syndrome if it has become established.

A third important application of Anahæmin B.D.H. is for the treatment of debility, diminished vigour and undue 'fatiguability'.

In all these indications Anahæmin B.D.H. is unsurpassed by the less highly refined liver products, in efficacy, volume and frequency of dosage and in economy.

London Medical Exhibition—members of the medical profession will be welcome at the B.D.H. Stand No. 140

HE BRITISH DRUG HOUSES LTD. LONDON N.1

Anah/E/106

DERMATOLOGY

• CHEMOTHERAPY

'ALBUCID' SOLUBLE *in septic-skin conditions*

• HORMONE-THERAPY

'PROGYNON,' 'TESTOVIRON,' 'ORAVIRON' *in Endocrine Dermatoses*

• CHRYSOTHERAPY

'SOLGANAL B' OLEOSUM *in Lupus Erythematosus*

Descriptive literature gladly sent on request

BRITISH SCHERING LIMITED 167-169 Great Portland Street, London, W.1

S.71

Potent penicillin for 'single dose' success

Early injection of sufficiently potent penicillin prc duces outstanding regression of infection and ma also save the need for frequent doses. With one o two doses of 200,000 to 500,000 units of Penicilli *Glaxo* many cases of infection of the hand, for example clear up completely. Pain is quickly relieved; anc even should pus form, localisation takes place avoiding spread, anc on evacuation healing is markedly hastened.

To shorten the total duration of disability, therefore, there is good reasor to use Penicillin *Glaxo* whose potency and purity is reflected by it content of not less than 1,400 units per mgm.—a routine achievement

PENICILLIN *Glaxo*

Packs of single vials: *100,000 units 2/9 · 200,000 4/9 · 500,000 10/6 : 1 mega (1,000,000) 20/*
Packs of 10 vials: *100,000 units 27/6 · 200,000 47/6 : 500,000 105/- : 1 mega (1,000,000) 200/*

Manufacturers of **PENICILLIN**

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

THE LANCET

LONDON: SATURDAY, NOV. 16, 1946

Yes or No?

THE enactment of the National Health Service Bill st week obliges the profession to reconsider its proisions and decide on a course of action The Act, as ; now emerges, is a much less revolutionary measure han it would have been if the original suggestions Mr. ERNEST BROWN had been translated into law. t derives much more from the long discussions etween the profession and the Ministry of Health han it does from any doctrinaire ideas of the present Minister's political party It is in fact much less cialistic than was predicted a year ago. Inevitably ny measure making State provision over a widening field must conflict at many points with established custom The question whether the advantages of a service planned on these lines outweigh the disadvantages is one that each one of us must answer individually in the light of his own convictions and circumstances Fortunately we are to have an early opportunity of recording our opinion. The council of the British Medical Association has wisely judged that the time has come to ascertain the wishes of the profession about the next step.

The Act now passed does not attempt to set out a detailed workable scheme ready to be put into action on the appointed day. It is in fact only a framework—an enabling Act, allowing the Minister to make gulations whereby a service can be brought into ing. In drafting these regulations, Mr. BEVAN will undoubtedly invite the aid of the profession: indeed he has indicated more than once that though the responsibility for the policies shaping the Act itself was one which Parliament could not and would not abrogate, there would afterwards be ample scope for consultation and expert collaboration in working out its translation into action Hence we may confidently expect an invitation to participate in this next phase. Are we to accept this invitation? It is this question that we are each being asked in the plebiscite now being taken by the B.M.A. What then are the implications, and what would be the consequences of a positive or negative answer?

In the first place we may note that it is not necessary o say now whether the profession should eventually participate in the service. The question is whether we ant our negotiators to take a share in devising the regulations to be made under the Act On this issue opinion will of course be divided. One group will hold that it is possible, within the framework of the Act, to draft regulations producing a service in which they could be content to work and able to work well In this hope they will naturally want to see the wishes and the experience of the profession given the maximum consideration during this next phase, and they will answer "Yes" to the B M.A.'s question. In so doing they will in no way commit themselves to joining the service later; for if their hopes are unfulfilled they will still be able to say that, on seeing the Act in its entirety, they cannot join the service. Those in the other group, who believe that no regulations, however favourable, could make service under the Act acceptable, will obviously not wish the profession to become involved in any further negotiations, and will answer "No" But there is much more finality about this negative answer, which can be given only by those who are firmly resolved to have nothing to do with the new service, however it may turn out. A negative answer from the majority will not prevent Mr. BEVAN from making his regulations, advised only by the officials of his Ministry: but it will remove the profession's main opportunity to improve the service. It is difficult therefore to see how the answer "No" could legitimately or logically be reconciled with reluctant acceptance at the latter end

Yet there will be many who will wish—at whatever sacrifice—to answer "No," because they will feel that in so doing they are taking their one chance to protest against the Act. When the Bill first appeared we all found clauses that struck hard at familiar ways and customs. Many of us hoped to see these clauses disappear from the Act; but, though most are modified, all remain. What we have to ask ourselves is whether the modifications sufficiently mitigate the hardship of the original proposals. In many cases we believe they do. For instance, under the original provisions the only doctors with access to private beds in a hospital would have been the consultants working inside the service in that hospital; but now access is offered to all practitioners (not consultants only) associated in a paid or an honorary capacity with the hospital—an enlargement that alters the whole concept. Modifications made in the powers of hospital management committees, and concessions over hospital endowments, have gone far to satisfy the voluntary hospitals. As regards the general practitioner's lot—and this after all is what most closely affects the greatest number of doctors—opposition was aroused chiefly by (1) the abolition of sale and purchase of practices and the penal clauses inserted in the Bill to guard against concealed sale of goodwill, (2) the limitation of the doctor's choice of an area in which to practise, and (3) the payment of a basic salary. None of these provisions has disappeared, but each has undergone modification in the Act, or in definite undertakings given by the Minister. Parliament has insisted on abolishing the sale of practices, even though this has meant voting a considerable sum of money to compensate the owners of practice goodwill; but it has so modified the penal clauses as to protect bona-fide transactions, and it has made it clear that the local doctors, including those remaining in the practice, will be able to influence the choice of successors to vacancies. It has also agreed that full consideration shall be given to the wish of a doctor to have a son or other relation join or succeed him in practice, and has thus materially reduced the objections to the powers of "negative direction." The Minister resisted the House of Lords' amendment which would have made payment by capitation the sole ordinary method of remuneration, and basic salaries therefore remain a probable part of the practitioner's emoluments; but as they are not mentioned in the Act their amount and even their universal application could still be matters for negotiation. Also, we have the Minister's assurance that the capitation fees and not the basic salary will be the major element of remuneration. Such modifications as these are not very great, but they certainly suggest that the Government wants to produce a practicable scheme. The passage of the Bill through the Lords was marked by a new atmosphere of constructive coöperation, which would improve results if continued.

Such arguments will give cold comfort to many. Thinking in terms of pre-war conflict rather than post-war reconstruction, they will regard them as appeasement, and will argue that there must be no compromise so long as any part of the Act is capable of being used or developed in such a way as to restrict clinical freedom or alter the relationship of trust between us and our patients. But those who take this view will do well to remember that any Act which sets out to assure a service to the people must contain some sanction for governmental use if unforeseen circumstances should threaten a breakdown of the service. Such a sanction was written into the National Health Insurance Act: it gave the Minister power to suspend N.H.I. regulations in a particular area, and institute there any form of service (not excluding a whole-time salaried service) that he thought appropriate. Yet during the last thirty years this power has only once been used, and the profession has been hardly aware of its existence. The opportunities that the new Act provides for professional participation in administration at all levels seem sufficient to ensure that no unjust use will be made in the future of the sanctions Parliament has now thought appropriate.

In this article we have concentrated on the immediate consequences of refusing further negotiations, and have said nothing about the more remote consequences that might be expected from a refusal by the profession to work the Act. We have tried to make it clear, however, that only an affirmative reply will give us the opportunity of seeing the whole structure shaped and completed under the most favourable conditions. Those who reject this opportunity will assume a heavy responsibility.

The Artificial Kidney

THE cause of death in acute uræmia has not yet been discovered but there is little doubt that the accumulation of diffusible metabolic products plays some part in it. If such products could be removed from the blood-stream during the period of renal failure the patient might sometimes be kept alive until renal function was re-established.

The removal from the blood of these "retention products" has been attempted experimentally in the *past by various ingenious means, such as employing* the peritoneum as a dialysing membrane and the perfusion of isolated loops of gut. The withdrawal of blood, separation of the plasma, and return of the corpuscles to the subject (plasma phæresis) was tried by ABEL and his co-workers,[1] who also attempted extracorporeal dialysis of the blood.[2] The possibility of such dialysis has stimulated a good deal of research, but, apart from THALHIMER's use of an artificial kidney for the reduction of azotæmia,[3] there have been attempts at practical clinical application. Dia has, until recently, been chiefly handicapped by lack of a harmless anticoagulant and the inh difficulties in obtaining a suitable dialysing memb and constructing a dialysis apparatus of suffi capacity. Dr. W. J. KOLFF[4] and his colleague Holland have now apparently solved these probl *and the result is* an "artificial kidney", whic sufficiently practicable for use in the wards. It pity that KOLFF has used this term for his instrum for "artificial glomerulus" would more accura describe its aims and function; but the more glamo title will no doubt persist, so it should be pointed that KOLFF is not its originator; the name app to have been first used by ABEL in 1913.

The use of this *artificial kidney is simple, once* appropriate patient has been selected. A glass cann is introduced into the radial artery; the patient is gi heparin, and a minute later blood is allowed *to* through a rubber tube to the machine. The mach contains a 'Cellophane' tube, 1–2 inches in diame and 30–45 metres long, wrapped round a rotating h zontal cylinder, part of which is immersed in "r ing" fluid. The blood, after traversing the "kidne once only, is returned to the patient via a g cannula fixed in a superficial vein. Air bubbles clots are excluded from the reintroduced blood b simple and apparently effective glass filter. blood moves through the cellophane tube by grav and is returned to the patient by pumping rinsing fluid, through which the cellophane dialys tube is passed as the cylinder rotates, is a clean not necessarily sterile solution of sodium and pot sium chlorides, sodium bicarbonate, and gluco The surface area of the dialysing membrane in artificial kidney is about the same as that of human kidney. The cellophane tube takes half litre of blood, which is passed through in about fo minutes, so that large volumes can be dialysed a few hours.

KOLFF has reported results with his artific kidney in 17 cases of chronic and acute uræm including cases of malignant hypertension wi contracted kidneys, bilateral renal tuberculosis, acu glomerulonephritis, postoperation uræmia progre ing to oliguria and anuria, bichloride of mercu poisoning, and uræmia following the use of chem therapeutic substances. Only 2 of these patier survived, but the chances of survival were practica nil in the fatal cases, some of which, however, show temporary improvement after dialysis. One of surviving patients, who had developed the anu after receiving sulphapyridine subsequent *to* course of sulphamethylthiazole, might well ha recovered in any case with appropriate treatmen which was duly administered. The other surviv was remarkable and might be *credited to the artifici* kidney.

A woman of 67 was admitted to hospital with feve jaundice, signs of acute cholecystitis, and almost com plete anuria; the small quantity of urine passed w cloudy and contained red cells and much albumi Cholecystitis and acute glomerulonephritis was dia nosed ("a hepatorenal syndrome, if you like," Dr. KOLF remarked) and the patient was given sulphathiazole f

---

1. Abel, J. J., Rowntree, L. G., Turner, B. B. *J. Pharmacol.* 1913, 5, 275.
2. Abel, J. J. *Ibid*, p. 625.
3. Thalhimer, W. *Proc. Soc. exp. Biol., N.Y.* 1938, 37, 641.
4. Kolff, W. J. *The Artificial Kidney*, Kampen, Holland, 1946.

days. Her temperature fell, but the anuria persisted. er 8 days the blood-urea reached 390 mg. per 100 c.cm., potassium rose "alarmingly," and the alkali reserve to 40 vol. per cent. Cystoscopy was performed and right pelvis was washed out without effect (the left ter was obstructed). The artificial kidney was then d and 80 litres of blood passed through it in 11½ urs. In this time 60 g. of urea was removed by lysis and the blood-urea dropped to 121 mg. per c.cm. and the potassium from 55 to 19 mg. per c.cm. There was some clinical improvement but the nary output continued poor for some days and the od-urea rose again to 172 mg. per 100 c.cm. However, the urinary flow and concentration slowly improved d 2 months after the dialysis the patient was well. e was seen 5 months later in "excellent condition."

OLFF is convinced that this woman would have ed had she not been treated with the artificial dney, but this opinion must be accepted with reserve view of the remarkable recoveries from apparently peless situations reported in cases of acute renal lure developing in such conditions as blackwater ver. In his recent lecture to the Medical Research ociety, however, reported on another page, **Kolff** nounced 3 more recoveries in 8 additional cases, cluding a child of thirteen years with acute omerulonephritis following exposure, whose condion was considered beyond hope by the physician ho sent her to him. It is evident that with increasg experience and confidence the clinical net is ready being cast wider, and this should hasten the tisfactory assessment of results.

The substances removed by dialysis of uræmic ood have been carefully studied by **Kolff** and his lleagues. The blood-urea concentration was unirmly lowered after dialysis, as will be seen from the ble (adapted from **Kolff**'s book [4]).

OD UREA LEVELS (MG./100 C.CM.) BEFORE AND AFTER DIALYSIS

Specimen of blood	Case					
	12	13I	13II	14	15I	15II
efore dialysis	203	704	386	548	389	375
fter dialysis . .	89	192	187	263	159	228

The maximum amounts of urea were removed from ose patients in whom the blood-urea was highest efore dialysis. Creatinine and uric acid were milarly reduced by dialysis. Provided the composition of the rinsing fluid in the bath was kept nstant, the sodium content of the blood was altered ttle by dialysis; the serum-potassium level, which as high in some patients, was lowered by dialysis, d other substances present in the blood, such as lphonamides, were partly removed. Where the bject was acidotic, small amounts of an appropriate lution of sodium bicarbonate were introduced travenously before dialysis.

Kolff has clearly shown that the rapid extrarporeal dialysis of blood in large quantities is a acticable proposition, and he has provided evidence dicating that in some cases such dialysis may tide patient over a period of acute renal failure and keep m going until renal function is restored. He has asked mself the important and highly relevant question: Are all the substances responsible for the clinical ndrome of uræmia being removed by dialysis?" d has supplied his own answer: "It is not one efinite substance that causes the intoxication and only in exceptional cases one definite substance will reach concentrations which would be toxic if it were alone. It is the sum of all the detrimental influences, of all the retained substances which leads to uræmia. Up till now not a single substance is known to us which might participate in this intoxication and is *not* being removed by dialysis."

The importance of the artificial kidney in research is obvious, but its clinical scope has to be established. At the moment it seems that any form of acute uræmia might benefit from its use. Anyone who has had to watch with furious impotence the final desperate stages of anuric death in blackwater fever or traumatic shock will welcome its development. It is to be hoped that Dr. **Kolff**'s apparatus will be given an extensive clinical trial, particularly in those potentially reversible renal syndromes which **Maegraith** and his colleagues [5] call "renal anoxia."

Poliomyelitis in Mauritius

During the first five months of 1945 there were over a thousand cases of poliomyelitis among the 419,000 people of Mauritius—an attack-rate comparable with the 1916 outbreak in New York and the 1942–43 outbreak in Malta. An incidence of this magnitude in an island community offered exceptional opportunities for an epidemiological field study which were fully grasped by Professor **Seddon** and his team,[1] who followed up over seven hundred of the cases and have carefully analysed the results. Their clinical observations are described in this issue.

Owing to the war very few people came to Mauritius between October, 1944, and April, 1945. It was therefore possible to exclude, with some certainty, the introduction of the disease from abroad. Another fact suggesting that the outbreak was an epidemic of an endemic disease was the relative immunity of older people, 95% of the cases being in children under ten years of age. The outbreak began soon after a cyclone had done much damage all over the island and at a time when intestinal diseases were increasing in prevalence. There was however no evidence that previous intestinal disease rendered individuals susceptible to poliomyelitis. Starting late in February, most of the cases occurred during the next 6 weeks, with a peak incidence in the third week in March. In towns there was usually a rapid rise and then an equally rapid fall in the number of cases, but in country districts the infection appeared to spread more slowly and mainly along the roads. In many places the first cases were the children of shopkeepers or lorry-drivers who had frequent contacts outside their own districts. In towns the attack-rates were lower at all ages than in rural areas, and in very densely populated places there was an inverse relation between the population-density and the attack-rate. It seemed therefore that the relative immunity of town-dwellers must have been acquired early in life and that it was to some extent increased by overcrowded living conditions. Boys were more often attacked than girls, and of the three main racial groups in the island the Chinese suffered more heavily than the Indians or Creoles. Greater opportunity for contact with strangers is suggested as the explanation of differences in the sex and race specific attack-rates, the Chinese section of the population, though small in number, being almost all shopkeepers.

---

[5] Maegraith, B. G., Havard, R. E., Parsons, D. S. *Lancet*, 1945, ii, 293.

[1] McFarlan, A. M., Dick, G. W. A., Seddon, H. J. *Quart. J. Med.* 1946, 15, 183.

Contact—using the term in the widest sense and including all possible forms of transfer from cases or carriers—seemed to the observers of this outbreak to be the most important factor in the spread of infection. In nearly a quarter of the cases, direct or indirect contact with a previous case could be established. In families with a case, the proportion of adults engaged in occupations taking them away from their home district was significantly higher than in the population of their district as a whole. Except in one village, where an explosive incidence may have been due to infected ice-cream, no evidence was obtained that water, milk, or any widely distributed food had acted as a vehicle, and flies did not seem to be greatly concerned in the transmission of infection. It was thought that fæcal spread was uncommon and probably less important than spread by pharyngeal secretions.

Observations on multiple cases in single households led to the important conclusion that the patients were commonly infectious early in the incubation period, which, judged from histories in which there was a short or limited period of exposure to infection, was the usual 8–14 days. This drew attention to the M-shaped or "dromedary" pyrexia exhibited by some patients—a transient fever with vague symptoms lasting a day or two followed a week or so later by the main feverish illness culminating in paralysis. There was reason to believe that this preliminary rise of temperature, sometimes seen within 4 days of exposure to infection, marked the beginning of infectivity. The rate of spread from village to village and the explosiveness of the whole outbreak were inconsistent with as long a time between exposure and the development of infectivity as the commonly accepted 8–14-day incubation period, and it was concluded that a frequent result of exposure to poliomyelitis virus is the development 1 to 4 days later of infectivity occasionally accompanied by a minor illness but not by paralysis; if paralysis develops at all, it appears a week or so later as part of a more clinically obvious illness. During the Mauritius outbreak there were only four cases of poliomyelitis with paralysis among the garrison troops who had been isolated as far as possible from the civilian population But in the later stages of the outbreak at least two hundred of these troops had a mild "pyrexia of unknown origin." Unfortunately, lumbar puncture was not done in any of these cases, but their minor illness may have been a non-paralytic reaction to infection by the poliomyelitis virus. Laboratory investigation has shown that some contacts excrete the virus from their pharynx or bowels, though they have so far shown no sign of illness or at most a trivial indisposition often regarded as an influenzal cold or gastric influenza. According to McFarlan and his colleagues[1] such minor illnesses, like the first limb of the dromedary pyrexia in some paralytic cases, are probably "illnesses of infection," commonly occurring within 4 days of exposure, and these contacts are infectious a week or so before paralysis would be expected This view is supported by Gear and Mundel,[2] who mention a boy who had poliomyelitis virus in his stool ea the incubation period and infected others at 4 days before he became ill himself.

Events in Mauritius supported the idea that d an epidemic of poliomyelitis the obvious wav paralytic cases is merely the trailing and com tively non-infectious shadow of a much larger and infectious wave comprising healthy persons excre virus; abortive cases (i.e., examples of "illne infection" which does not proceed to clinic recognisable poliomyelitis); and paralytic cases alre in the incubation period, some of them showing first hump of a dromedary fever. The spread virus by the pharyngeal and fæcal excretions of components of this initial wave, which precedes paralytic cases by at least a week, may explain hitherto baffling features of poliomyelitis in small large communities. It throws light, for instance, the conclusion drawn by Stocks[3] from a statist analysis of the records of poliomyelitis in Lancas during 1920–29—that for every recognised case least one hundred other people became infected were presumably immunised. None of this solves problem of effectively controlling poliomyelitis epidemic form, but if the chief factors in the sprea *poliomyelitis are the secretions of the human phar* and aerial transmission of virus, then the best prosp of control seem to lie in the development of protect inoculation and a search for the unknown fact which *determine* why *most* of those infected esc invasion of the central nervous system.

Annotations

DOCTORS STILL UNEMPLOYED

The Government's postgraduate scheme for demo lised doctors was originally planned with two princ aims: it was to provide for young doctors some of hospital experience they missed by their service, and enable those who had planned to specialise to res their interrupted training. For would-be special the way has now been eased by a relaxation of the c ditions required of applicants for class III posts, and a promise to increase both the tenure and the numbe these posts. These extensions of the training scheme, the new £1000-a-year appointments for fully qual specialists which the Minister is encouraging hospi to establish at Treasury expense, reflect concern that greatest possible number shall be trained and retai in the specialties so as to meet the requirements of new National Health Service; and if the new terms fully applied, specialists, actual and potential, sho have little difficulty in bridging the awkward gap betw now and 1948.

No similar offer has been made to demobilised gen practitioners, though their difficulties are also ac Young graduates who were not established in prac before entering one of the Services can apply for months' class I hospital appointments; but many not wish, and few can afford, to spend the next eight months in these or similar posts at the salary of a se houseman. Mostly, therefore, they seek work in gen practice, where their future lies. But when they ap to an agency they find themselves at the end of a l and almost unmoving queue. Principals, they are t are biding their time until 1948, and are not want either successors, partners, or assistants. There indeed, evidence that this reluctance to take

---

2. Gear, J. H. S., Mundel, B. *S. Afr. med. J.* 1946, 20, 106.

3. Stocks, P. *J. Hyg*, *Camb.* [illegible]

w blood, which we noted some months ago,[1] has come more pronounced than ever. "I was told of a actice for sale the other day," said an agent: "I could ve sold it for certain to any of several dozen doctors. he first one I offered it to bought it the next day." hese unemployed doctors are not a true surplus; there e not too many but too few in practice. This was evitable during the war because other claims came first, t today there is no such excuse.

Several ways of ending this artificial separation of ctor from patient have been proposed It has been ggested, for example, that the limit of 2500 on the umber of patients which a doctor may have on his anel list should be reimposed. This may commend itself s just and reasonable; but it is not enough If, before 948, the public is to have the fullest possible general-ractitioner service, those now in practice must be urther persuaded to share work of which they have ore than enough with those that have none A correspondent of the *Manchester Guardian* (Nov. 11) suggests n announcement that compensation under the Act will be paid at 1947–48 (not 1939) values, which would, he thinks, lead many doctors to employ assistants to enlarge their practices. The final alternative is active support from the Government. The Minister is understandably ore reluctant to subsidise the general practitioner than he specialist, because the immediate benefits in training, nd the remote advantage for the new service, are less bvious. But these doctors are mostly of the younger eneration, and without any practical knowledge of ivilian general practice. When the service comes into being the demands on the country's practitioners may be greater than ever before, owing to the large number of patients who for the first time will be offered free medical attention. It would help the service to get off to a good start if, in the meantime, these doctors were trained for their responsibilities by an apprenticeship under those who already have experience of practice.

The future service, we are told, is to concern itself ore with preventive methods. For their success these depend on genuine understanding between the public-health and the clinical services—an understanding which hitherto not been as close and cordial as it might. The Minister might therefore like to encourage some of those for whom a place in practice is not immediately found to spend the coming months gaining first-hand experience in the various departments of public health; he would thus be assured of a group of general practitioners having a particular understanding and sympathy for preventive practice. Those that are not absorbed into practice should certainly not be left to kick their heels until they are needed, as they will be, to help in the operation of the Act; to rest content with this continued unemployment is to accede to the attitude that the general practitioner needs no special knowledge or experience beyond what he has gained from undergraduate training and casual hospital appointments.

CHLORIDES IN CEREBROSPINAL FLUID

THERE still seems to be some doubt about the interpretation of chloride levels in the cerebrospinal fluid (C.S.F.) in the diagnosis of meningitis. Honor Smith,[1] in her recent paper to the Tuberculosis Association, rightly emphasised that there is no level characteristic of tuberculous meningitis.

Nearly twenty years ago, Linder and Carmichael[2] demonstrated that the fall in the C.S.F. chlorides in meningitis was associated with a fall in the serum of plasma chlorides, and the same approximate relationship between C.S.F. and plasma chlorides has been shown to hold for other conditions. For example, a low level of serum chlorides is common in nephritis and constant in alkalosis, and in the latter condition the lowest C.S.F. chloride levels of all are met with. In infection in general, and in tuberculosis in particular, there is often a fall in the serum chlorides, and this is mirrored in the low C.S.F. chlorides, irrespective of whether there is meningitis or not. In the "meningism" associated with lobar pneumonia and other conditions C.S.F. chlorides of 650 mg. per 100 ml. and lower may be met with without any evidence of meningeal infection.

In true meningitis, as shown by raised protein and cell contents of the C.S.F., there is usually, though not invariably, a fall in the chloride level of the serum and hence of the C.S.F., and this fall is usually, though again not invariably, greater in tuberculous than in non-tuberculous meningitis, but the difference is a statistical one and may be misleading in an individual case. Allott[3] has shown that in about 50% of cases of tuberculous meningitis there is a C.S.F. chloride level of 640 mg. per 100 ml. or lower on first examination, whereas for non-tuberculous meningitis the 50% level is 675 mg. per 100 ml. Very low C.S.F. chloride levels are commoner in tuberculous than in non-tuberculous meningitis, and Allott found 25% of tuberculous but only 5% of non-tuberculous meningitis cases with levels below 600 mg. per 100 ml. on admission to hospital.

The cytology of the cerebrospinal fluid in the two main forms of meningitis is usually distinctive, the pyogenic form containing numerous polymorphs and the tuberculous form predominantly lymphocytes. But difficulties are sometimes met with here also, since in the early stages of tuberculous meningitis there may be only a slight rise in the cell content and more than half the cells may be polymorphs—a finding similar to that in poliomyelitis and virus encephalomeningitis. Tubercle bacilli can be found in smears in a fair proportion of cases of tuberculous meningitis if the C.S.F. is examined repeatedly, and they can be grown in culture from the majority, though, owing to the slow growth of the tubercle bacillus, the culture result is often obtained only after the patient's death. Notwithstanding these difficulties, the characters of the C.S.F. tend to change towards the "typical" finding of high lymphocytes and very low chlorides as the disease progresses; and most cases can be diagnosed with certainty by repeated examinations, even if the first specimen of fluid gives equivocal results.

SCIENTIFIC LIAISON BETWEEN NATIONS

UNTIL the first world war, science had been considered to be above the battle. The example usually given is that of Sir Humphry Davy visiting France at the height of the Napoleonic wars, and being honoured by Napoleon himself. From 1914 to 1918, however, the scientist was found to be such a vitally important part of the nation's war effort that this scientific internationalism broke down completely; only medicine escaped, and the doctor was still expected to treat friend and enemy alike. Between the two wars attempts were made by various organisations, notably the League of Nations, to bring together scientists from all countries, and the last few months has seen a heartening revival in such attempts—for example, the British-Swiss Medical Conference and the International Medical Conference in London. In a special number of *Chronica Botanica*, published in the autumn of last year, B. Cannon and R. M. Field review the aims and methods of international scientific relations, both past and future.

Their memorandum starts by emphasising that "war is a great stimulus to national, and to limited international, coöperative scientific research in most of the applied sciences." What is needed today, to quote Joseph Needham, is "an attempt to combine the methods which the world of science has spontaneously worked out for itself in periods of peace with those which the nations have had to work out under the stress of war." To this end a questionnary was sent out to the various international congresses, unions, and associations with a view to finding out how much exchange of information (other than for war purposes) had taken place during the war years between different countries, and how much post-war activity was anticipated by the congresses, &c. Most were of the opinion that international scientific relations are of great value in helping mankind towards a more settled form of existence. A few thought it would be better to revert to the old system under which individuals or societies arranged to meet among themselves; but, as Needham points out, the fallacy of this attitude is that the picture of world science looks very different when seen from Rumania, Peru, Siam, or China, than from such centres as Paris, London, or Washington. For hundreds of years the growth of science and technology has been most rapid in those countries with greatest access to raw materials; the upheavals and divisions produced by the search for raw materials has been one of the profoundest causes of wars in the past. The memorandum emphasises this, and also the enormously increased bearing which science has on human welfare in normal peace-time activity. At the same time there is the paradox that the man in the street learns less and less about the advances in science owing to its increasingly technical language; and one of the most constructive suggestions made at the International Conference on Intellectual Coöperation at Havana in November, 1941, was that there should be a new class of "intermediary" scientists to convert a highly symbolised mathematical language into a literary form which can be understood by most men and women with an average general education and is at the same time scientifically accurate.

---

[1] *Lancet*, 1946, i, 968.

[1] See *Lancet*, Oct. 12, p. 528.

[2] Linder, G. C., Carmichael, E. A. *Biochem. J.* 1928, 22, 46.

[3] Allott, E. N. *Proc. R. Soc. Med.* 1945, 38, 275.

Perhaps the most urgent reason why scientists should meet together and collaborate is to avoid the suspicions which arise from a narrow nationalistic outlook. How necessary this is may be judged from the fact that in the past the Russian government, through its Academy, has preferred to communicate with individual American scientists rather than with their organisations. Scientific bodies work in ways which differ considerably, and one of the recommendations at the end of the memorandum suggests that "the foreign secretaries of the Russian Academy of Science, the Royal Society of Great Britain, and the National Academy of Sciences of the U.S.A. should explore the possibilities of an inter-Academy study of their international relations in those phases of science which are of benefit to mankind, and inimical to none."

EQUAL PAY

Two years ago a Royal Commission, with Lord Justice Asquith as chairman, was appointed "to examine the existing relationship between the remuneration of men and women in the public services, in industry and in other fields of employment; to consider the social, economic and financial implications of the claim of equal pay for equal work; and to report." Briefly, they find [1] that while equal pay is usual—and indeed harmless—in the professions (except nursing and teaching), it is unusual in the civil service and in industry; and while all the members favour its introduction into teaching, the civil service, and the Post Office, the majority feel unable to recommend it in industry and commerce. As to nursing, they content themselves with stating without comment the position since the Rushcliffe reports appeared. A note of thankfulness sounds in the remark of the majority that their terms of reference do not call them "to attempt any final summing-up of the relative importance of ensuring exact ju between individuals on the one hand and oiling the wh of economic progress on the other." In this disclaimer minority—Dame Anne Loughlin, Dr. Janet Vaughan, Miss L. F. Nettlefold—have no part, holding that " claims of justice between individuals and the development of national productivity point in the same direction."

The commission note that for most of its advoca "equal pay for equal work" means a fixed rate for t job; it does not mean equal pay for equal value to t employer. The majority believe that the lower w of women can be accounted for by lower efficiency while the minority argue that the main cause of th low earnings is the exclusion of women from a numb of trades in which, given opportunity and training, the would be efficient workers, combined with weak trade union organisation. Some legal restrictions on nigh work, and, in some trades, on length of hours worked b women, reduce their value to employers; but, as th minority remark, medical evidence suggests that wome are as well suited to night work as men, and restriction on the length of hours worked will matter less as standar working hours are reduced. In the same way, th greater physical strength of men will have less importanc as machinery is substituted for muscular power. I was alleged by some employers that women are less abl to deal with "surprise situations" than men. Finally it is admitted that absenteeism is commoner amon women; but this is due, as all agreed, to the famil responsibilities of women, and their attitude to employment, rather than to physical disabilities. The minorit suggest that it is "both unfair and economically undesirable that an individual woman should be penalised, eve if she is never absent, and an individual man benefited even if his attendance is poor, because, on the average men have a better record of attendance than women."

In any case, any difference in efficiency between the sexes is considerably less than the difference in wage-rates—women often being paid only about 60% of the men's rate. There are even statutory wages councils which discriminate against women merely because it is customary in their trades; and cases of this sort, the commission believe, should be remedied by Government influence. It is worth recalling that professional women, already assured of the right to equal pay, were often given that right by strong organisations. They include doctors, dentists, physiotherapists, radiographers, university teachers, actresses working for ENSA, journalists, and some librarians. Nor was it always easy to enforce the principle as medical history shows. But women in industry often have little sense of the value of organisation the proportion of trade-union members among working men just before the war was 37%, among women 11% by 1944 the figures were 61% and 29%.

The commission has produced a mass of valuabl information and argument, and its failure to reach mo unanimous conclusions is scarcely surprising in view the intricacy of the subject. A serious practical objectio to ensuring "exact justice" throughout industry is that by and large, women have fewer dependants than men To give them the same pay would raise their standard of living relatively to that of the married man and his wife and children. Already, despite income-tax reliefs and family allowances, the pecuniary penalties on marriage and parenthood are so severe as to be socially harmful, and, unless we are prepared at the same time to introduce adequate dependants' allowances for all workers, it might do more harm than good to equalize wages generally between men and women. The fact that men usually have heavier responsibilities at home is one of the reasons why the average employer, given a choice between a man and a woman at the same rate of pay, will usually prefer the man—which means incidentally that enforcement of equal pay for women would increase any risk of unemployment for them. Since many women have expensive dependants, and many men have none, this habit among employers is only a very blunt instrument of social justice. Yet it is wielded occasionally even in the professions, where the custom of equal pay for equal work has sometimes been known to deprive women of appointments for which they were fit. We do not regret that custom, but it is insufficient by tself. As the commission point out, our present family allowances and income-tax rebates are insufficient; and we doubt if any effort to make remuneration equitable will get far without the inclusion of larger allowances for dependants.

---

[1] Report of the Royal Commission on Equal Pay. Cmd. 6937. H.M. Stationery Office. Pp. 220. 4s.

SYNTHETIC PENICILLIN

THE recent announcement in the press that penicillin G (I) has been synthesised in America, though accurate in fact, may have been misleading in emphasis, for the yield is very small.

During the war penicillins F and G (I and II) were obtained in traces by synthetic processes which were worked out simultaneously in Oxford and in the Merck laboratories in New Jersey, U.S.A. Secrecy had to be maintained at the time, but a joint monograph is shortly to be published. It was clear in the early stages of these investigations that the antibacterial product obtained was penicillin, but more evidence on this point was gathered by workers at Cornell University, who also obtained the product in a high degree of purity. Du Vigneaud and his colleagues[1] of the Cornell biochemical department have now described the synthesis of penicillin G, by the interaction of *d*-penicillamine and 2-benzyl-4-methoxymethylene-5 (4)-oxazolone. There seems to be no likelihood that a way will be found of increasing the yield, and indeed the chances of any other reasonably cheap penicillin synthesis being developed are remote. On the other hand, the work done by British and American chemists may well lead to the preparation of [illegible]w "unnatural" penicillin compounds which may have a [illegible]le something that the natural products haven't got.

1942: THE TIDE TURNS

THE coincidence of the celebration of the fourth anniversary of El Alamein and the publication of the Registrar-General's report on 1942[1] had a certain significance, for 1942 marked the turn of the tide in the medical as well as the military sense. 1940 and 1941 were marked by all the vital statistical indications of the effects on national health of the strains of total war. Mortality rom pulmonary tuberculosis, respiratory diseases, and cerebrospinal fever had risen considerably above their pre-war levels; the downward trends of infant and maternal mortality had been halted, and there was a rise in the civilian death-rate. Some of this mortality was due either directly to the air-raids, which caused 2,215 deaths in 1940 and 19,543 in 1941, or indirectly to the rise in infectious diseases resulting from the congested living and working conditions and poor diet inevitable at the time.

The recovery in our military fortunes which 1942 brought was associated with a striking improvement in the statistical measures of national health. The most sensitive indices of well-being—infant mortality and pulmonary tuberculosis death-rates—fell to record low levels of 51 per 1000 related live births and 542 deaths per million of the civilian population at all ages. Epidemic diseases, such as whooping-cough, measles, and scarlet fever, all had low mortality levels; cerebrospinal fever caused only 1143 deaths compared with the 2459 deaths of 1940. These results were at least partly the result of the less harassing conditions of life suggested by the fall in the number of air-raid deaths to 3891, most of which occurred in the "Baedeker" raids on Bath, Exeter, and Norwich. The achievement for the first time of a death roll from diphtheria below 2000, however, can be fairly attributed to the Ministry of Health's immunisation campaign. A curious feature of these annual reports on the war years is the progressive decline, noted also in the first world war, in the number of suicides; from a pre-war annual average of 5000, the toll fell to 3416 in 1942.

The Comparative Mortality Index, which takes 1938 as a base line of 1·000 in the standardisation for age, was introduced in the 1941 report[2]; in that for 1942 it takes its place as a regular feature. From 1938 the trend in civilian mortality is clearly indicated by the C.M.I. Similarly the ratio of male to female mortality shows the disproportionate rise in mortality among the men of the civil population.

	C.M.I.	*Male-female ratio*
1938	1·000	1·343
1939	1·022	1·339
1940	1·171	1·382
1941	1·070	1·406
1942	0·942	1·416

The Registrar-General's report for 1945 is in preparation, and we may look forward to a resumption of the complete and up-to-date reports of pre-war practice.

ON THE STAFF

AT some hospitals junior honoraries are not distinguished from their seniors except, possibly, by an "assistant" before their titles. At many others the distinction is one not only of name but also of privilege: the assistant may, for example, be expected to see all outpatients, and may have under his personal charge only a few beds, the number depending on his principal's liberality. This practice is blessed by the years; but, as a correspondent indicated some months ago,[3] it is one that would best be abandoned. The division of duties is indefensible; work in the outpatient department no less than in the wards requires all the skill a unit can command; and there is much in favour of the care of the patient, after admission, being in the hands of the doctor who first examined him as an outpatient.

The assistant honorary, who, in any case, shares an equal weight of responsibility with others on the staff, should be rewarded at least by official recognition in the allocation of beds. St. Peter's Hospital for Stone, London, have now announced that the title of assistant surgeon is to be discarded there; all the honorary surgical staff will be called honorary surgeons and will control an equal number of beds, except perhaps for some slight advantage to one or two of the most senior. Junior honoraries elsewhere will hope that this example is not lost on other hospitals.

THE SCOTTISH BILL

THE Bill providing for a comprehensive medical service for Scotland was published last week. Though the scheme as a whole follows the English model, there are several interesting variations. For example, the provision, equipment, staffing, and maintenance of health centres will be the duty of the central health department, and though the Secretary of State is empowered to delegate this function to local health authorities he is, it is stated, unlikely to exercise this power widely in the early years of the new service. The main differences between the Scottish Bill and the English Act are described in our parliamentary columns.

Du Vigneaud, V., Carpenter, F. H., Holley, R. W., Livermore, A. H., Rachele, J. R. *Science*, Nov. 8, 1946, p. 431.

Registrar-General's Statistical Review of England and Wales for 1942. Tables: part I: medical. Pp. 319. H.M. Stationery Office. 5*s*.

[2] See *Lancet*, Sept. 28, p. 469.

[3] *Lancet*, 1945, ii, 350.

further method of dialysis under trial was to isolate oop of ileum surgically, bringing both ends to the face of the abdomen and anastomosing the remaining stine. It had been shown that perfusion of such a p a metre long for 10 hours would remove as much as . of urea from the blood. Dr. Kolff concluded by fore- ing the time when a man in whom both kidneys had n removed might perform his nightly lavage, after ng about his ordinary daily business.

WOMEN DOCTORS IN WAR

At a meeting of the Medical Women's International sociation, held in London from Sept. 19 to 22 under the sidency of Miss Louisa Martindale, F.R.C.O.G., women ctors from Belgium, Denmark, Finland, France, Great itain, Holland, India, New Zealand, Norway, Sweden, itzerland, and the United States described the work their colleagues during the war.

IN THE FORCES

Dr. S. Lamotte (France) said that French medical men had won an uncontested place in the Army ring the later campaigns. The occupation of France ade it impossible to set up an officially recruited force, t a body of women doctors got together and worked ith the French Army in France, North Africa, Italy, ngland, Alsace, and Germany—the A.F.A.T. (the rench women's auxiliary army force), formed in North frica in 1944, contained a medical corps of over 150. fter the liberation the corps set up centres for refugee ildren and treated deported men in Germany. Dr. amotte herself later joined a biological and therapeutic search station of the medical corps which studied oblems of malnutrition and infection.

Dr. Letitia Fairfield (London), one-time woman edical adviser to the War Office, said that medical omen had been used almost interchangeably with en. The only difficulty that had arisen was over utine inspections in men's barracks. In the recruitment nd training of the A.T.S. they had also been able to ggest points where the routine of the Army must be apted for a women's service. Before the end of the war ere were 600 women doctors in the Army. Dr. Dorothy enwick (London) said that women doctors were given mportant work in the Air Force and were well received y their male colleagues. She herself covered 22,000 iles a year on visits of inspection, and every airwoman ad the opportunity of consulting a woman medical fficer.

RESISTANCE

Dr. Fog (Denmark) told how medical women in her ountry had secretly received weapons, helped and ansported saboteurs, hid refugees and parachutists, nd acted as couriers. Constant coming and going made onsulting-rooms a safe place of rendezvous, visits to atients afforded a means of conveying information, mbulances and hospitals were often used to save Jews nd others whom the Germans were seeking, and ounded saboteurs were kept in secret clinics and private ouses. Many women doctors were discovered and sent concentration camps for long periods. Dr. Droever onnet (Holland) related how one woman doctor was leader of the whole Dutch movement, and how another ho used her house as a centre of the resistance was rrested and killed by the Germans. Yet another, as hief doctor in a German internment camp, was able help some internees to escape.

Dr. Astrid Guldberg (Norway) told of ten women octors who were imprisoned for their share in the esistance, and of one who went voluntarily with her ewish patients to Germany, and has never been heard f again. Dr. de Blainville (France) was arrested for er resistance activities in 1944 and sent to Fresne rison, near Paris, and then to Ravensbrück, the biggest oncentration camp for women in Germany, where there ere 16,000 internees at one time with no medical ttention. Huts were densely overcrowded, and infection as rife. Examination for pregnancy was conducted ith no attempt at cleanliness, and prostitutes mingled ith healthy women. Experiments were carried out on the prisoners with the greatest cruelty. Many women were treated as guineapigs and then put to death.

RECONSTRUCTION

Dr. Bergerot (France) said that 600,000 arrests were made in France during the war, and there was still no news of 250,000 people who were deported to Germany. There was an order in France that employers must take back their old employees, but this created difficulties because so many of the returning men were suffering from emotional instability, loss of memory, and physical deterioration. Dr. Jeisler (France) declared that the peak of delinquency and emotional disorder in children was reached in 1942, and had since lessened. The war had increased psychological disorders in children, but only among those who had already shown such tendencies. A few children had been found living wild in bands near the towns at the time of the wholesale deportations. Some, who had lost their parents or had seen them maltreated, wanted to avenge them. Jewish children had been particularly difficult. The surviving children of the deportees were like little savages. They had their own laws and their own chiefs and were brutal, but with patience they were gradually coming back to normal.

Dr. Middlehoven (Holland) said that Holland had set up relief units, which had enabled them to combat in a short time the most cruel consequences of the hunger blockade. Tuberculosis and syphilis had increased alarmingly, and congenital syphilis was now not uncommon. The physical condition of the Dutch population of the Netherlands East Indies, who had been evacuated to Holland after the capitulation of Japan, was deplorable, and dispensaries for tropical diseases and nutritional deficiencies had been set up. She was impressed by the training and education which the children had been given by their mothers in the Japanese camps. They behaved much better than the Dutch children, who practically ran wild during the war years. Those who had collaborated with the Germans presented another grave problem. They were still in camps, their children had been taken from them and placed in homes or with foster parents, as camp life was not suitable for them, and it was feared that they would become infected with Nazi ideas.

The next international congress is to be held in Holland, in June or July, 1947, when the Place of Medical Women in Post-war Reconstruction will be the topic for discussion.

MENTAL DEFICIENCY IN NORTHERN IRELAND

The Mental Health Services Committee appointed by the minister of health and local government to investigate the problem of mental deficiency says in its report[1]:

> "In Northern Ireland there is no Mental Deficiency Act, no institution, no community supervision, and there is only one special school (in Belfast), which is unable to meet even local needs. Apart from the inadequate provision made by the Education Acts and the Poor Relief Acts, the responsibility for dealing with mental defectives has not been placed by statute on any authority and, for the most part, these unfortunate people lead a hopeless existence at home, in Poor Law institutions, or in mental hospitals . . . we cannot over-emphasise the need for early action."

Ascertainment, the committee suggests, should be improved by placing on medical practitioners and on schools a statutory obligation to notify the mental-deficiency authority of suspected deficiency. Defectives should be dealt with by the ministry of health as the central authority, and by a regional authority composed of representatives from county and county-borough councils and other interested bodies; this regional authority should be responsible for ascertainment, the provision and administration of institutions, and the supervision of defectives in the community. Local mental-health committees should be formed to advise the regional authority and coördinate the activities of those interested. The mental-deficiency authorities should be either amalgamated or closely associated with the authorities administering all the other mental-health services. It is proposed that the mental-deficiency authority shall be given compulsory powers to deal with all ascertained defectives.

---

[1] H.M. Stationery Office. 1s.

> "It is wrong to wait until the defective gets into trouble or runs foul of the law before affording him the care, supervision, and training which his mental condition requires and which it is in his own interests to receive. Mental deficiency is often hereditary, and we consider it wrong to leave any power in the hands of mentally defective parents. . . . It is not suggested that all defectives would be sent to institutions."

The committee favours a single colony with, eventually, 1000 beds, to be established within 20–30 miles of Belfast. A school should be included, where the opportunity of education might be extended not only to those unsuitable for ordinary or day special schools but also to the so-called ineducable defectives. Suspected defectives should be admitted for a short time to an observation unit which should not be in, but should be near, the colony. Defectives in the colony could be sent out on licence to a hostel, a private house, or their own homes. The provision of sheltered employment, the committee concludes, should be considered when mental-deficiency legislation is being drafted.

NOBEL PRIZEMAN

THE award of the Nobel prize for 1946 in physiology and medicine to H. J. Muller, of Indiana University, will be welcomed by scientists all over the world. Muller's genetical work is widely known mainly on account of his spectacular demonstration in 1927 of the effects of X rays in producing mutations. His imaginative power at once enabled him to develop the discovery in collaboration with others, to plan further experiments, and to appreciate the evolutionary significance of the new knowledge. He focused attention on the essential property of the genic substance—namely, its ability not only to copy itself but, after being changed by mutation, to copy the alteration as well. Apart from the impressive contributions of Muller in the experimental field, his capacity to integrate many aspects of the subject has made him an outstanding figure in genetics. At the present time the medical importance of the knowledge of radiation effects on germ cells is becoming increasingly obvious, and Muller's work is now of more practical value than even he himself could have foreseen twenty years ago.

Public Health

Tuberculosis under the National Health Service

THOSE who have worked among the tuberculous hold that this disease presents a special medical problem and must be considered apart from other social diseases. Dr. Norman Tattersall, principal medical officer of the King Edward VII Welsh National Memorial Association,[1] fears that under the National Health Service Bill the need for unity of tuberculosis control is being lost sight of; chest cases are to be referred to the care of a chest physician, bones and joints to the orthopædist, and other forms to the appropriate special department. Though he agrees that each special department must direct the treatment of particular phases of infection, yet tuberculosis is always an infectious disease combined with a social problem, and all forms must be subject to broad control of the disease, with the family and not the individual as the unit. "If this is lost," he writes, "we shall witness a reversal of the principle which has guided the development of the service ever since Sir Robert Philip opened the first dispensary in 1887."

Sir Edmund Spriggs, in a discussion of the same subject at the annual meeting of the association's board of governors, said that the Bill as at present drafted seems to hand over tuberculosis to general physicians, surgeons, and health visitors, though pulmonary cases would be protected to some extent by the fact that some of the new chest physicians would be former tuberculosis doctors. For some fifty years he has watched the development of the medical and surgical management of tuberculosis, and has concluded that it does call for special experience. "A doctor without that experience is no more able to do the best possible for a random series of cases of tuberculosis than he is to perfor succession of varied operations before he has had surg training." Among his reasons for regarding tubercu as a problem of its own he gave the following:

1. It is a general disease with local manifestations. division into pulmonary cases and surgical cases, to be tre by physicians and surgeons respectively, is not wholly so At the North Wales Sanatorium, Dr. F. S. Hawkins and G. O. Thomas recently found pulmonary disease present no less than a quarter of 143 so-called surgical cases. complication might easily have been overlooked if the pati had been transferred to general surgical wards, beyond supervision of a tuberculosis specialist.

2. Many tuberculous patients must be segregated, for t own sakes and that of the community.

3. They need treatment over a long period.

These last two considerations mean that tuberculous c must be managed on a different plan from other dise amenable to arrest and cure.

4. Pulmonary tuberculosis is the commonest chr disease of young people. Other common chronic dise such as heart disease, arthritis, and arteriosclerosis, oc mostly in later life, and many of those affected are alre of pensionable age; others by care and treatment may g five or ten years of useful life. But every case *of tubercul in a young person which is arrested*, or *better prevent* brings to the community 30–40 years of possible usefulne The treatment of this disease, especially of early cases, t has a high economic value. "It pays handsomely."

Lastly, Sir Edmund believes that, to get the b results, the care and reablement of the dischar tuberculous patient and of his whole family should be the hands of specially trained health visitors who are direct personal relation with the expert tuberculo doctor. A liaison between the staffs of general hospit and tuberculosis hospitals is desirable and will bene both, but if the welfare of the patient is to be the fi consideration there should not, in his view, be fusion.

Paratyphoid in Sheffield

New cases of paratyphoid in Sheffield have now fall to 1 or 2 a day, and it seems likely that the source infection present in September and October has be eliminated, though it is still untraced and likely to rem so The total number of cases to Nov. 12 was 141. T younger age-groups have been most affected throughou and the illnesses have been of moderate severity, b with a remarkably profuse rash.

The authorities of Sheffield University felt th members of the staff and students should not be deni the protection by inoculation which has been so success in the Armed Forces. Arrangements were made T.A.B. inoculations to be carried out in the bacteriolo department on four days of one week and four days the succeeding week; 340 completed the course of t inoculations of 0·5 and 1 c.cm., and an additional 26 h one inoculation only. There were no serious reactio

This is not a new departure in Sheffield, for immuni tion against typhoid and against diphtheria was ma available to students and staff who desired it during t war years 1940–43, and large numbers took advanta of the offer. In view of the changed situation it was provided in 1944 or 1945. In all cases the immunisati was entirely voluntary and the diphtheria immunisati was naturally only given to Schick-positive subjects.

Infectious Disease in England and Wales

WEEK ENDED NOV. 2

Notifications.—Smallpox, 0; scarlet fever, 116 whooping-cough, 1549; diphtheria, 274; paratyphoi 66 (38 at Sheffield); typhoid 6; measles (excludi rubella), 3374; pneumonia (primary or influenzal), 48 cerebrospinal fever, 40; poliomyelitis, 25; polioenceph litis, 2; encephalitis lethargica, 0; dysentery, 69; pue peral pyrexia, 117; ophthalmia neonatorum 63. No case cholera, plague, or typhus was notified during the wee

Deaths.—In 126 great towns there were no deat from enteric fever, 3 (0) from scarlet fever, 2 (0) fro measles, 8 (1) from whooping-cough, 3 (1) from diphtheri 31 (2) from diarrhœa and enteritis under two year and 12 (1) from influenza. The figures in parenthese are those for London *itself*.

The number of stillbirths notified during the week w 273 (corresponding to a rate of 30 per thousand tot births), including 38 in London.

---

[1] Thirty-fourth Annual Report of the Association. Pp. 35.

In England Now

Running Commentary by Peripatetic Correspondents

THOSE of us who have returned to England after some ars overseas find it a very different country from the ie we left. I am not referring to the physical changes war but to the changed mental outlook. Long-ntinued shortage of all the luxuries and many of the cessities of life has lowered the standards of honesty. en the most respectable people will go to extraordinary igths to get a little extra "off the ration," and, since gh taxation has made the investment of money for terest hardly worth while, people have taken to eculating in property to increase their capital. Car-aling is the commonest form of speculation—one hears people buying a new car for £600 and being offered 200 as they drive it out of the garage—but there are any others. Professional dealers in goods are com-aining that the amateurs are ruining their business. ne obvious result of all this property changing hands the creation of artificial shortages. Let us hope that e cry of "Every man for himself!" will no longer heard when the home markets become stocked with ough goods for everyone. Otherwise I shall be off to e jungle, where the decencies are observed.

* * *

Who will take up the cudgel on behalf of some of the ost hardly hit victims of the world rubber shortage? G.P.s of the pre-war days we used to see these now happy creatures at three, six, or even nine months' tervals and perhaps we scolded them gently for not siting us more often; but it did not really matter. those days Britain was supreme. We owned Malaya, d rubber was rubber; so if a few thoughtless ladies hung to their ring pessaries for more than the usual three onths we knew they were comfortable and did not eatly care.

Things are different now. These hapless women haunt r surgeries and monopolise our phones. "The ring u put in last week has slipped." "I can't walk. The ckache is terrific." "The rubber has perished and I've ly had it in a month." Many suffer in silence. They agine that we will think they are complaining about thing. Their housework becomes torture. Many nnot cycle. Others dare not lift a bucket of coal. At st we were inclined to blame ourselves. We fitted other ring and prescribed patience. But things did t improve and all round the story is the same.

Nowadays most rings are made of synthetic rubber. ey are thinner than formerly. The rubber perishes ickly and they slip out of place easily. The victims inarticulate. They will never write letters to the press bombard their M.P. with demands for better service. t something should be done about it.

* * *

One of your peripatetics, writing of a children's club Holland, remarked that English boys are not normally aid of the police. Nor are they—unless of course they ve been "up to something." Anyone who wants to relations between boy and bobby at their best ould visit one of the clubs run by police in some of great cities. Norwich started the idea more than years ago.

Perhaps the most important point about these clubs that they emphasise the friendly and helpful side of policeman's attitude to the junior ranks of the popula-n. Another thing is that a club (or anything else) der police management is likely to be efficient. They ve the knack of doing a thing thoroughly and well if y do it at all. The prevention of crime is the first lice function, and in no better way can they discharge ir duty than by directing the energies and interests the young into healthy channels and giving them the ht sort of examples to imitate and the right sort of als to aim at. Boy is a hero-worshipper by nature, and fortunately or unfortunately—he does not always ect his heroes wisely. Saintliness does not in itself ke any strong appeal to him. Even *honesty*, as such—d to say—evokes no enthusiasm. He wants toughness his hero, physical strength, and skill with the fist, e foot, or the gun. For this reason a good many of the youngsters who are most likely to go wrong avoid such entirely admirable organisations as the Boys Brigade, Boy Scouts, and so on; and fear of too much discipline often keeps them away from the Cadet Corps.

It's just these little "tough guys," often from bad homes and an unhealthy environment, that are most likely to get into trouble—sometimes serious trouble leading eventually perhaps to a life of crime, unless something is done to pull them up. Police have special opportunities of making contact with these types, and it is less difficult to get them to come to a police-run club than an ordinary one, because the policeman has at least some of the attributes the lad looks for in his hero: he is a bit of a tough guy himself, and the boy knows that there will not be any sloppiness in a police club. There will be well-run games and good boxing, things to learn which may be useful, and even perhaps the chance of picking up a good job later on.

Though several of our big towns have such clubs, until quite recently the experiment had not been tried in London. What can be done in a self-contained compact community like Norwich or Swansea is not so easy to achieve in a vague inchoate area like Hornsey or Lambeth. However, a start has now been made at Croydon, which is within police London. An energetic police superintendent, backed by other officers and a strong local committee of enthusiastic Croydon citizens, has opened and is running a club for boys in a district where nothing much of the kind exists. The superintendent and his friends want to strike a slightly new note. Every boy is to be made to understand that he has got to give as well as take: he won't get all the fun and games for nothing. His payment is to be in the form of service; he must qualify in first-aid and life-saving, and he must learn all about his municipality and how it is run. He will be taken to see the wheels go round—on visits to the town hall, the power station, the gas works, the hospitals, and other local institutions—and he will be expected to know about every kind of local activity of a public and semi-public kind.

Later this club may experiment on lines that have been successful in American cities, where they have what they call a "junior police corps." Boys who have been club members and have fulfilled their obligations as such are allowed to join the corps; they are given a uniform, and on state occasions when something is happening—a convention meeting in the town, perhaps—they turn out and make themselves useful, running messages, parking cars, answering inquiries, and so forth. All this is good. Something for nothing is an unhealthy principle, and by giving a boy responsibilities you develop his character and at the same time give an outlet to the natural urge to excel and be a bit of a chap in the eyes of his young companions. Also of course the best hope for our local government is to attract into it more sound men with no axes to grind, and the best chance of achieving that is to rouse their interest at an early age.

* * *

I agree with your peripatetic correspondent of Oct. 26 on the difficulty of judging the meaning of testimonials and personal letters, but I think he is wrong in interpreting, "He is an excellent teacher of the *list* type" as meaning, "You have been warned!" To my mind this means that the candidate is one who gives students lists of causes, symptoms, complications, &c., and usually simplifies the whole matter very much. Such a teacher is, as a rule, very popular and has a great following among students, especially if he is a good clinician. He tends to attract the poorer type of student, but gets many a man through his examinations when he would otherwise fail, and serves a useful purpose in the hospital.

At the opposite pole is the teacher who stresses the importance of principles rather than details which can be read in a textbook. He tries to make the student think for himself and not accept blindly what he is told, and rather emphasises difficulties instead of smoothing them away. This teacher has a smaller influence, but the better type of student follows him, and his educational value is much greater. Most teachers of course use both methods, but some rely more on "lists" and the others more on principles. Both kinds of teaching are necessary since the students, thank goodness, are not all of the same type.

Parliament

NATIONAL HEALTH SERVICE BILL

THE House of Lords on Nov. 6 considered the Commons' reasons for disagreeing with certain of the Lords' amendments. The LORD CHANCELLOR moved that the House "doth not insist" on the amendment which provided that the London County Council should delegate to the metropolitan borough councils the provision of maternity, child welfare, and home services. The Commons disagreed:

> Because it is expedient that all the services provided under Part III of the Bill in any area should be the responsibility of a single local authority, and the appropriate authority, in the County of London, as in other counties, is the county council.

The effect of the amendment, Lord JOWITT said, would be to destroy the unitary basis of the services. Speaking on behalf of Lord Latham, he gave the assurance that the L.C.C. were fully aware of the necessity of avoiding undue centralisation, and on May 28 the council had declared that they would entrust day-to-day management of the local health services to area committees to which members of the metropolitan borough councils would be elected. Members of those bodies would also be elected to the statutory health committee of the L.C.C. The area committees were to have real and genuine executive powers.

Lord BALFOUR OF BURLEIGH welcomed this assurance as far as it went, but said it unfortunately did not go very far. This was a thing on which the borough councils felt just a bit sore. He hoped that Lord Latham and the L.C.C. would be a little better than their word this time and play the game.

The Lord Chancellor's motion was agreed to.

BASIC SALARY

On clause 33 (arrangements for general medical services) the Lord Chancellor moved that the House "doth not insist" on the amendment that the remuneration of doctors providing general medical service should be by the capitation method, save in exceptional circumstances. The Commons had disagreed:

> Because it is inexpedient that the method of remunerating the doctors providing general medical services should be laid down in the Statute.

Lord JOWITT submitted that it was too restrictive to lay down the method of remuneration in the Statute. It had never been done in regard to national health insurance; it had always been left to regulations made after consultations with the profession. It was also, he suggested, inappropriate for the Medical Practices Committee to be the judge of "exceptional circumstances." It was for them to make recommendations to the Minister, upon whose shoulders lay the responsibility for securing an adequate service.

Lord LLEWELLIN said that those who had supported the amendment were anxious to see that more consideration was placed on the relationship of patient to doctor than on the relationship of doctor to the State. But he recognised that there was quite a lot to be said for not putting in the Act the exact terms of the doctor's remuneration when the discussions between the Minister and the medical profession had not been concluded. Since the amendment was carried by their Lordships the Minister had stated that it was intended, unless in exceptional circumstances, that the salary should be a minor element and that the main part of the remuneration would be by capitation fee. The amendment, he thought, had been valuable in evoking that statement from the Government. He accepted the Lord Chancellor's motion as he did not wish at that stage to wreck the Bill.

Lord HORDER still felt that the principle which underlay this amendment had not been modified by the Minister of Health, though he agreed that the posit had been clarified. The statement made by Mr. Be was a statement of faith on the part of the pre Minister, who could not, of course, speak for fut ministers. If the capitation method was done a with at some future time, then the fear which had ne been removed from the minds of the doctors would intensified. The Minister's statement called for a h gratitude, though his colleagues in general prac were left rather cold by this small morsel of com which had been thrown to them. If the Minister wis to have the medical profession with him, as he said did, then he might have gone further. It was doubtful whether the doctors were going to come willingly and enthusiastically to work this sche Lord Horder hoped they would. It was odd, he s gested, that so much was said about the doctors' secu when they said so little about it themselves. Th were not dissatisfied with a certain amount of insecu when they started, nor with a healthy spirit of comp tion as they went on.

Lord MORAN thanked Lord Jowitt on behalf of profession for the reasonableness which he had sho in the discussions, but regretted that he had describ this amendment as a blemish on the Bill. Even at t late hour Lord Moran thought it was fundamental t they should know exactly what was the doctors' attitu towards this proposal. The doctors found it v difficult to know why the political world was so anxi to provide them with security for which they had n asked. In his 25 years as dean of a medical school had never once heard the question of security discuss It was a fundamental belief throughout the professi that there was something profoundly wrong with a m if he could not make a livelihood in medicine. He wou go so far as to say that this question of a basic sala was a figment of the political imagination and had support in the facts of the doctor's life. As to t suggestion that the capitation fee led to abuses a undesirable practices, Lord Moran did not deny th there were isolated black sheep, but were they on th account to have the whole of the remuneration of all t rest of the honest members of the medical professi altered in a way which the profession almost unanimous felt might result in a deterioration of medical practi in the future? It was of enormous importance that t doctors should have confidence in the Ministry of Healt and that confidence would not be created if the politic world impugned the honesty of the great body of t profession. Generally speaking, doctors did not belie that the zeal and fervour of the rank and file of t Labour party for the basic salary was inspired sole by solicitude for young doctors. They believed that was an instalment which might be conveniently add to from time to time towards the introduction of a whol time salary. He entirely accepted what Mr. Bevan h said in the Commons, but Ministers of Health came a went, and this principle remained as a basic faith on t part of the political party which had so often express it. If ever this basic salary did become a whole-tim salary the effect upon the proficiency of the professio would be impossible to calculate. The Lord Chancellor motion was agreed to.

At a later stage the Royal Assent was given to th Bill by Royal Commission.

THE SCOTTISH HEALTH BILL

THE National Health Services (Scotland) Bill, intro duced on the last day of the session, differs from th English Act as regards hospital endowments, the positio of the teaching hospitals, and the provision of healt centres.

The endowments of each voluntary hospital transferre to the Secretary of State for Scotland will pass, in th he board of management responsible for nd the board will hold them in trust were held before. The Secretary of State wever, to set up a Hospital Endowments review all endowments and make schemes e management. Such schemes may specify purpose for which endowments are to be permit their use for any purpose related or specialist services or to research : and in schemes the commission is to take into spirit of the intention of the founder of the t as well as the interests of the hospital service The commission will consist of a chairman by the Secretary of State and other members d as he may determine.

ade the general duty of the Secretary of State de hospital services for both physical and mental but he is to entrust their administration to al hospital boards and local boards of management. regional boards are contemplated, and it is intended they shall enjoy a high degree of autonomy. There be no differentiation between teaching hospitals and r hospitals in the region : all are to come within framework of the regional organisation. Each onal board will be composed of people chosen by the retary of State for their individual suitability, but fore making the appointments he is to consult any iversity with which the hospital services of the area are associated, bodies representative of the medical profession, the local authorities of the area, and others concerned. Boards of management for individual hospitals or groups of hospitals are to be appointed by the regional board in accordance with a scheme drawn up by the board in consultation with the university, and proved by the Secretary of State. The scheme will ecify the hospitals which are to provide facilities for edical teaching, and each board of management is to nclude members appointed after consultation with the cal health authorities of its area, with the executive uncils for general-practitioner services in its area, with the senior medical and dental staff of the hospitals concerned, and with the governing bodies of any voluntary hospitals that are to come under the board. The board d management of a teaching hospital will include ominees of the university and teaching staff. The Bill places a specific duty on the Secretary of State to make available for medical education such facilities as he considers necessary to meet all reasonable requirements, and these duties will devolve on regional boards and boards of management. In addition there is to be a medical education committee in each region, to advise the regional board. This will consist of members appointed by the universities concerned, with an equal number appointed by the regional board : and representatives of other bodies, such as the Royal Medical Corporations, will also be included where appropriate.

A main feature of the general-practitioner services is to be the development of health centres designed for general medical and dental services, for many of the special services of the local health authorities, and for outpost clinics of the hospital and specialist services : they can also be used as bases for health education. The Bill makes it the duty of the Secretary of State to provide, equip, staff, and maintain the new health centres, and though he is empowered to delegate this function wholly or partly to local health authorities, the summary issued with the Bill (Cmd. 6946) explains that "it is not intended to exercise this power widely in the early years of the new service."

The Highlands and Islands (Medical Service) Grant Act is repealed : so the Highlands and Islands Medical Service will lose its identity, becoming merged in the general framework. The disappearance of this distinctive Scottish service will occasion regret north of the Border.

THE KING'S SPEE

In opening Parliament last Tuesday the KING that his Ministers recognise that the housewives of the nation have had to bear a specially heavy burden because of the shortages of houses, of foodstuffs, and of other consumer goods. It would be an urgent task in the new session to encourage an increase in the productivity of industry so as to raise the standard of living at home and expand the export trade. All necessary action would be taken to enable the school-leaving age to be raised next April. Legislation would be introduced for nationalising inland transport services and electricity supply, for the better organisation of a number of important industries, for the establishmen of a Ministry of National Defence, for the continuatio of national service, for dealing with compensation and betterment in relation to town and country planning, and for empowering local authorities to operate civic restaurants. "My Ministers," he said, "will do all in their power to increase the supply and variety of food and to see that it is efficiently and equitably distributed," and "will prosecute with the utmost vigour the task of providing suitable homes," ensuring that those most in need of it have first claim on new accommodation.

FROM THE PRESS GALLERY

Danger of Winter Famine in Germany

In the House of Lords on Nov. 6 Lord SALTOUN asked the Government what was being done to deal with the famine now prevalent in the larger cities of the British zone in Germany. When he was in Germany three months ago he found that the lassitude of the people in the streets was so obvious that anybody who moved with any briskness immediately caught the eye. The older children showed sunken eyes, drawn faces, and shrunken legs, sometimes with sores which were probably due to anaemia. He saw young children with faces that he could have covered with the palm of his hand. In spite of the all-pervading limey dust the population was incredibly clean, but all the time he was conscious of a sweetish sickly smell. A doctor whom he consulted said that it might come from a derangement of the liver caused by hunger. It was clear to him that the people were suffering from an advanced stage of malnutrition ; he would call it famine. He was informed that there had been a considerable loss of weight amongst the population and that was borne out by his own observation. The population was incapable of a full day's work, and although men in heavy occupations were given supplementary rations many preferred not to work a full week because the ration did not compensate them for the expenditure of energy caused by the extra work. Young children got preferential diet and yet the infant mortality-rate had trebled in Hamburg over the figure in 1938. Hunger œdema was prevalent, and was as great among the better to do as among the manual workers. It was thought improbable that any mother could suckle her own children. Infectious diseases did not show any great increase, but tuberculosis had made enormous strides, especially recently.

Lord PAKENHAM, replying for the Government admitted that the food situation in Germany was serious The present ration of 1550 calories a day for the norma consumer, while sufficient to sustain life, was not sufficien to enable a man to undertake reasonable work for a lo period. It was about half the German pre-war consum tion, and a little more than half the present level of c own rations. None of us could feel complacent 23,000,000 people for whom we possessed any share responsibility were living at that standard. It wa heartrending affair, but it was a mess of the Ger people's own making. Nevertheless, it must be a cons preoccupation of the British Government to see Germany could be enabled to consume more, or at be prevented from having to consume less. There four ways in which the problem could be tackled. British zone could grow more food, and everythin being done to make that possible. The Britis could obtain more food from Eastern Germany. T Germany could obtain more food at the expense people of this country. The question of whether the British standard of living further in order Germany was perhaps the hardest moral issue

British Government had had to face, and the Government were reluctantly but absolutely clear that nothing more could be done in that direction at the moment. To attempt to solve the problem along those lines by our own actions and by our own direct assistance would be to attempt an impossible task likely to bring down this country and Germany in common ruin. In the long run the food situation in Germany would be cured by the recovery of food-production in the world. In the short run everything hinged on what could be obtained from overseas—much of it at the expense of the British taxpayer.

QUESTION TIME

Rheumatism Research

Mr. H. SUTCLIFFE asked the Lord President of the Council what was the estimated expenditure in Great Britain at the present time on research into the chronic rheumatic diseases; what proportion of this work was fostered by the Medical Research Council; and whether any increase or acceleration of such research could be achieved in the near future.—Mr. HERBERT MORRISON replied: I have no figures of expenditure from private sources such as the Empire Rheumatism Council and the Nuffield Foundation. Expenditure by the Medical Research Council directly on this problem is estimated at £3500 per annum at the present moment, but the figure is subject to considerable fluctuation as new lines of approach to the subject are opened up. It also takes no account of fundamental research of a more general kind which may indirectly throw light upon the problem.—Mr. SUTCLIFFE: Is the Minister aware that there is no type of disease in connexion with which further research is more urgently needed just now, and is not the contribution by the Medical Research Council altogether insignificant?—Mr. MORRISON: No, Sir, I do not agree. There is plenty of research being done otherwise, and the mere amount of money spent is not necessarily a guide to success. I have a feeling that probably the solution to this problem will be found some day by a sheer fluke when somebody is looking at something else which has nothing whatever to do with this particular problem.

Sir W. WAKEFIELD: Could the Minister arrange for greater publicity to be given to the very valuable work done by the Medical Research Council?—Mr. MORRISON: It is difficult to train scientists to adopt a proper and appropriate sense of publicity. I expect they get a bit frightened by the Opposition who object to any sort of publicity about anything.

Release of Army Doctors

Sir E. GRAHAM-LITTLE asked the Secretary of State for War if he was aware that doctors in the Forces overseas were suffering, as an example submitted showed, from uncertainty with regard to their release, occasioned by the issue at the end of 1945 of a Government statement reducing the ratio of doctors to 2 per 1000, which was contradicted by a later Army circular fixing the ratio at 2·75 per 1000; and if he would now inform the officers concerned of the actual position.—Mr. F. J. BELLENGER replied: The ratio of 2 doctors per 1000 troops was agreed under the conditions existing at the end of 1945 to enable the maximum number of doctors to be returned to civilian practice for the winter months. By that measure the Army alone was able to release 5600 doctors by the end of February. Present estimates, based on an overall cover of 2·75 per 1000 British troops, provide also for medical commitments other than those that can be considered a purely military responsibility and for military families overseas. The release programme for medical officers must depend upon the strengths and deployment of our Forces generally, and the dates for release of the various age and service groups are announced as soon as possible. The release of doctors is thus inevitably linked with the release programme for the Army as a whole, and whatever the percentage of doctors per 1000 may be, there must necessarily be some uncertainty for individuals until a definite programme has been announced. But there is no more cause for uncertainty in the minds of doctors than in the minds of any other members of the Forces.

Recruitment of R.A.M.C. Officers

Replying to a question, Mr. F. J. BELLENGER stated that he could not at present give accurate figures of the number of R.A.M.C. officers that will be required in the post-war Army. There were now 454 holding permanent regular, and 461 holding short-service, commissions in the R.A.M.C. After the end of the emergency the normal method of entry would probably be by short-service commission.

Letters to the Editor

THE REGIONAL BOARDS

SIR,—Now that the National Health Service has become law, it is generally expected that the M of Health will shortly proceed to constitute the regi boards. Your leading article last week is there particularly opportune, but I wonder if you are r in your view that the function of these boards is prim one of administration? It is true that, according to Bill, regional hospital boards will be constituted " the purpose of exercising functions with respect to administration of hospital and specialist services," it seems desirable to me that the boards should concerned with broad lines of policy and that t detailed administration of hospitals should be left the hospital management committees and to the ho committees of individual hospitals which, it is cle from the discussions in the House, the Minister inten to use.

I would suggest that the prime concern of the region board should be to organise a hospital and speciali service which will provide the best possible faciliti and treatment for patients, so that they can obtain complete medical service of the highest grade in hospitals readily accessible to them. If this suggestion be accepted it would follow that the primary qualification of the chief executive officer of this board should not be, as Mr. Power holds, his experience of hospital administration, but rather his intimate knowledge of the medical aspects of hospital care. Such a knowledge might conceivably be possessed by an experienced hospital administrator, but this is unlikely unless he is also a medical man. It is, however, possessed by some medical officers of health who, by virtue of their office, have also had considerable experience of administration; indeed it is even possessed by some clinicians, although it would probably be unwise to take them away from clinical work. The chief executive officer should have advisers in the more important departments of medicine, in nursing, and possibly also in administration. It would probably be an advantage if these were part-time appointments. In addition to these advisers it might be advantageous to have an advisory committee in each of the medical subjects for which there was an adviser, or the advisers could combine to form one such committee.

My idea of a regional board, therefore, approximates to the "alternative" plan of your correspondent and is based on the regional organisation of the Emergency Medical Service. The sector organisation of the Emergency Medical Service had in one respect an advantage over the regional organisation, since the hospital officer had less independence than the sector officer because he was on the staff of the senior regional officer. Senior regional officers, who were regular civil servants, were usually first-class administrators and splendid colleagues, but they had to supervise all the regional activities of the Ministry of Health. Moreover, they did not possess first-hand knowledge of running a hospital, either on its administrative or medical sides; yet, by nature of their office, they could over-ride decisions of the hospit officer except in matters of medical treatment.

One other advantage that the regional boards wi have is that they will be in a position to enforce their decisions on backward hospitals, whereas in the Emergency Medical Service the Ministry of Health only gave advice and a hospital could refuse to carry out the instructions of the hospital or sector officer. It speaks well for the hospitals of this country that the great majority accepted and loyally carried out the advice given them.

The chief executive officer will be appointed by the regional board, but the other key officer of the board—its chairman—will be appointed by the Minister. I would suggest that in almost every instance (perhaps in every one) the chairman should be a layman. There are experienced lay hospital administrators who could fill this position excellently, but in the majority of cases it would probably be wise to choose someone who had been chairman of a large voluntary hospital or of the hospitals committee of a large local authority. Such an ndividual would be well versed in hospital procedure, ut he should not be considered for the office unless e is also possessed of a judicial and well-balanced ind.

My views may not carry conviction either to my olleagues or the Ministry of Health, but I put them orward as a contribution to the discussion which your eading article seems certain to provoke.

Birmingham. LEONARD G. PARSONS.

THE SHACK PERIOD

SIR,—Your annotation of Oct. 12 (p. 534), discussing he Hospital of the Future, ends with the significant entence, "Meanwhile hospitals could be making use of he shack period to concentrate on personnel." Certain t seems that with time we shall have the walls and organiation—probably fine ones, too—but it is men, and not he walls or the forms, that are going to decide the ltimate standard of service. This theme was taken up oth by Sir Heneage Ogilvie and by Mr. George Perkins t the recent British Orthopædic Association dinner.

It is generally agreed that the development of the mind needs the constant sharpening of wits on one nother's whetstones. To see the work of others, to glean thoughts, the half thoughts from which so many others flow, is the best education for the doctor. Every progressive business man of substance is now sending his representatives abroad for that purpose. Surely it is time that this became part of the policy of the major hospitals.

The hospitals should not rely on and take advantage of the generous spirit and charitable heart of their staffs to keep themselves abreast at their own expense. A multitude of doctors, after years of work in the Services, find themselves financially unable to afford such travel. Rarely do they care to proclaim their financial embarrassment, and there follows the attitude of indifference, of laissez-faire; their spark of enthusiasm is smothered. Lambrinudi, in his wisdom, once remarked, "the trouble with doctors is that they are ashamed to admit that they are poor." The evening gossip columns, at regular intervals, delight in building up stories of the thousands of pounds those at the top of the tree are supposed to em; they utterly mislead the public. This is well reflected in the salaries now being offered for some of the leading professorial chairs. The senior judge gets, so I am told, something like £5000 a year; he merely interprets the law, has to decide on a few squabbles, and is perhaps occasionally called on to decide on the life of often a worthless individual. Whoever heard of such a salary being offered to our leading men? We must not forget that not only is such a leader responsible for a large number of lives, but, by passing on his hard-gained knowledge, he directly influences the happiness and life of thousands of others. There is no branch of any work as exacting as medicine, and Mr. Perkins, in addressing some remarks to the Minister of Health, made a very eloquent plea for a "decent" salary; not only for the actual work of the doctor, but to enable him to have regular holidays in comfort, and return refreshed in mind and body. The older the doctor the harder he has to work, for time then brings its reward; the business man, in his ageing days, can usually recline and be but a bystander.

At present practically the only opportunities for sponsored travel are those offered by the Medical Research Council; their funds, as everyone knows, are woefully limited, and they can support merely those travelling for positive research and who are prepared to devote themselves to a long full-time job. I would plead, therefore, that major hospitals change their attitude; that they pay and encourage their staff to attend congresses, send them to different hospitals abroad, and, of course, to those in their own country as well. There is always the smug attitude that we have done very well without such sponsoring. But that is not true. All our surgical giants travelled regularly; for their fees were heavy, their competition slight, and they could afford it. I remember Arbuthnot Lane saying to me in his later days, "I offer you two bits of advice—look after your health, and make it a rule to travel every year."

It may be said that hospitals cannot afford to pay for such travel. But that does not seem true, for I see vast sums of money being expended on the establishment of occupational therapy centres and all the luxuries of reablement. These are pleasing to the administrator or the superficial eye of visitors, but, as every surgeon knows, they are but meretricious tinsel unless there has been careful thoughtful primary surgery.

This war revealed that in the growing generation we have a brilliant young team: men with imagination—"the mother of fact," as Moynihan called it. It would be far better to send some of these men to travel than to bluff ourselves that these crowded pseudo-appointments, which many now have, are to their advantage. We must not overlook also that such travel does other things: it builds friendship and promotes understanding between nations, and one of the outstanding lessons of the war was the value of the personal contact.

May we hope, too, that in the selection of personnel for the hospitals a broad generous vision will come to be developed; men will not be picked for their willingness to pay lip service, for their possession of personalities unlikely to be competitive, or even because they have been registrars so long that it would be hard not to elect them. Obviously the guiding principle must be the type of service that they will be able to offer to the hospital. I hope, too, that the large hospital will not forget that their staff have a wider responsibility, a duty to pass on their painfully gathered experience to colleagues. That needs active support through the provision of funds for ample secretarial assistance, good photographic departments, a good follow-up system. It is not for these men merely to cull the thoughts of others—"pick the plums from other people's platters." They have a moral obligation to repay.

London, W.1. SOL. M. COHEN.

PSYCHIATRY IN BATTLE AREAS

SIR,—Those who have had experience at regimental aid-posts will confirm the opinion of Major Haldane and Captain Rowley (Oct. 26, p. 599) that there is no need and no place for refined psychological methods in forward battle areas. Unless a R.A.P. is cluttered up with casualties or much exposed to the enemy it is a suitable place for the treatment of anxiety neuroses. Common sense and a sound judgment of character are the main requirements ("psychiatric intuition" is perhaps the same thing), and even combatant officers who know the value of rest, reassurance, and listening to other people's troubles have often successfully treated or prevented battle neuroses.

Many patients suffering from acute anxiety never reach corps exhaustion centres. Those who are the least predisposed to neuroses react best to treatment at the R.A.P., and thus an unduly large proportion of the weaker types is seen farther back.

Records were kept of the psychiatric work done at the R.A.P. of a field artillery regiment over a period of ten months spent in battle—from the invasion of Sicily to the Anzio beach-head. It was usually not difficult to assess a patient's condition and decide what to do with him while he was still in a highly strung state. As a rule the men led the conversation to the source of their trouble and then betrayed themselves by emotional reactions (tremor, quivering voice, tense look, &c.). What mattered *most* was not the cause of their anxiety—this was easy to guess—but how they coped with it. Life in battle is uncomplicated and so are neuroses; it helped, however, that all men in the regiment were personally known before going into action.

34 manifest cases of war neuroses were seen during the ten months. Of these, 3 were evacuated without thorough examination because there was no time to deal with them; 12 were evacuated because they were considered unsuitable for treatment at the R.A.P. or because conditions were too bad for them; 5 were evacuated because they failed to recover in a few days, or relapsed; and 2 were sent to a psychiatric centre for a further rest after they had improved at the R.A.P.

12 patients were successfully treated with rest, reassurance, and sedatives, without evacuation from the regimental area; one of these was soon killed, but all others withstood the stress of further battle without relapse. The patients who were never seen by a psychiatrist make up a third of the whole series, but only one

of them belonged to the group which formed the majority of Haldane and Rowley's cases, and was described as having a "low anxiety threshold" and "low anxiety tolerance."

Of the 22 men evacuated to psychiatric centres only 6 returned to duty in the front line, and this includes the 2 patients sent back for more rest. This seems to confirm the opinion formed in the 1914–18 war that a patient's chances of recovery diminish with every move away from the enemy, though it may simply mean that those who were not likely to recover were selected for evacuation.

It might be worth adding one observation. Although the amount of stress various men could withstand varied greatly, three conditions contributed to the origin of all battle neuroses: (1) prolonged danger; (2) vivid impressions of the effect of enemy weapons (narrow escapes, wounding, the sight of casualties, &c.); and (3) physical hardship (fatigue, lack of sleep, hunger, cold, sickness, &c.). There were no manifest neuroses without all three causative factors, though one or two of them often gave rise to mild psychological upsets.

B.A.O.R. E. M. GLASER.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—In this correspondence the serious question of mistaken diagnosis seems not to have been raised. In most cases the clinical diagnosis is confirmed at laparotomy. In a few instances, however, not only is it found to be incorrect but the state of affairs is such as might well lead to disaster under a conservative régime. Most surgeons of experience must at some time have been deceived by a ruptured appendix exactly simulating a perforated ulcer. We have recently seen cases, confidently diagnosed as perforated peptic ulcer, which at operation proved to be ruptured appendicitis, perforation of the colon in carcinoma, in diverticulitis, and by foreign body, perforated Meckel's diverticulum, ruptured amœbic abscess, and ruptured ovarian cyst.

London. K. E. BOND.
Portsmouth. B. L. WILLIAMS.

SIR,—From the correspondence following Mr. Hermon Taylor's interesting paper of Sept. 28 it is evident that other surgeons have experience of the conservative treatment of perforated peptic ulcer. Moynihan, in his book *Abdominal Operations*, had no doubt that recovery by medical treatment alone was possible both in the acute and subacute forms of perforation. He records two cases under his care in which perforation had been diagnosed by competent medical men, and, operation being impossible because no skilled help was available, the patients were treated conservatively; the diagnoses were later confirmed by Moynihan himself at operation. Singer and Vaughan[1] in a paper entitled "'Formes frustes' type of perforated peptic ulcer" record their radiological discovery of gas under the diaphragm indicative of recent and unrecognised perforation.

In 1939 I first treated a case of perforated duodenal ulcer by conservative means, being encouraged to do so for the reason which later moved Mr. Taylor—because in previous cases I had often found the ulcer soundly closed by omentum or adjoining viscera. The first case was a man of 40 years, 2 hours perforated, who recovered without complications and left the hospital in 18 days. In 1939 and 1940 fifteen cases of undoubted perforated peptic ulcer were treated conservatively, with two deaths. The cases were entirely unselected and were those admitted under my care to the surgical wards at the Essex County Hospital, Colchester. Gas was found under the diaphragm on several occasions but was not a constant finding, nor did the amount of gas bear any relation to the severity of symptoms and the patients' recovery. The age of the patients ranged from 25 to 57 years and the length of the history from 2 to 24 hours, and the average stay in hospital was 18 days. The two fatal cases were over 50 years of age and both had been perforated 24 hours: the first died in 13 days from a subphrenic abscess, and the second died an hour after admission to hospital from shock. The patients were treated on Sherren-Ochsner principles without aspiration of the stomach, and except in one fatal case no resid abscess developed, but chest complications, includ atelectasis, were common, though not so severe as those cases submitted to operation. In this connex I would draw attention to the danger of precipitati pulmonary œdema by the injudicious administration intravenous saline, whether as part of conservati treatment or postoperatively.

There can be little doubt that in the past many medic men have treated perforated peptic ulcers by conservati measures, often without knowing the true state of affai One of my early cases was a general practitioner, wh under the impression that he was suffering from bilia colic, treated himself, and although the radiogra showed gas under the diaphragm such clinical improv ment resulted from heavy dosing with morphine that t patient would not countenance surgery, and he was n pressed to do so.

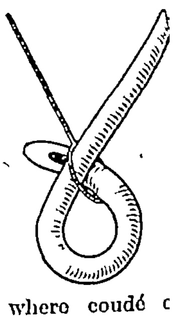
It is no longer my practice to treat *all* cases of pe forated peptic ulcer conservatively, but to reserve t new method for those cases where one can safely conclu that only a minor leak has occurred or where a leak threatened. If a recent meal has been taken the stoma contents are aspirated and continuous suction employe until there is evidence that the peritoneal reaction receding and the rent has closed. In the more severe cas the conservative régime is used and supplemented by small laparotomy under local or skilled general ana thesia, preferably with gas, oxygen, and curare. Th does the operation take its place in the planned campai of treatment. The exclusively conservative treatment all cases demands the finest clinical judgment on t part of the surgeon and may be the cause of profou anxiety to all those in attendance.

Mr. Taylor's paper records an advance in the manag ment of perforated peptic ulcer and confirms the exper ence of other surgeons, but the prudence of Prof. Gre Turner, as expressed in his letter of Nov. 9, demands, always, the highest regard.

Colchester. RONALD REID.

SUPRAPUBIC PROSTATECTOMY

SIR,—I was interested in Mr. Lane's description a method of procuring curvature in a catheter (Sept. 14, p. 398). Over 35 years ago my quondam chief, the late Colonel Damer Harrison, used to thread the end of the gum-elastic catheter of those days twice through the eye of the metal stylet, after which, using the latter as a holder, he plunged the catheter into very hot water for a few seconds and then into cold water. This resulted in the catheter acquiring a degree of "temper" and a tendency to coil at the end, and greatly facilitated its passage where coudé bicoudé instruments had failed.



Public Health (Tuberculosis)
Department, Liverpool. JOHN P. CLARKE.

CARCINOMA OF PROSTATE IN ANIMALS

SIR,—In his article of Oct. 19, Mr. Fergusson states in regard to ætiology, that "Unfortunately the rarit of prostatic cancer in animals has so far prevented an confirmatory investigations." Veterinary publication undoubtedly support this view, but, though it is true o the larger domestic animals, it is certainly untrue of th dog. For the last two years I have been treating prostati "cancer" in the dog with stilbœstrol dipropionate using the dose-rate first suggested in the human. I hav records of over 40 cases of prostatic disease, a fair propor tion of which are cases of gross prostatic hypertroph assumed to be carcinomatous. I hope to publish thes findings shortly in the veterinary press.

We have one great advantage over our medical con frères—that there is generally little difficulty in securing a necropsy in our cases. I have recently done necropsies on two dogs with testicular tumour (one was malignant with widespread abdominal metastases), and in both cases the prostatic tissue was negligible, resembling the prostates of castrated dogs. The feminising effect which

---

1. Singer, H. A., Vaughan, R. T. *Surg. Gynec. Obstet.* 1930, 50, 10.

produced with this lesion in dogs has been fully dis- ssed by Huggins and Moulder,[1] who suggest that these mours are Sertoli cell type neoplasms. The necropsy another case of testicular tumour which was operated (castrated) two years previously revealed negligible static tissue. In the entire series there was only e case where secondary metastases were demonstrated post mortem from a neoplastic gland and these were nfined to the inguinal lymphatic glands. I would ggest that in the dog there is a wide field for study prostatic disease which will no doubt have its lessons r human medicine.

Blackburn, Lancs. ALEXANDER H. HOGG.

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—Dr. Prestwich says that I wrote disparagingly five minutes' psychotherapy. In fact I made no ference to five minutes' psychotherapy in my letter Oct. 26, and his error of observation detracts from the lue of his testimonial to Dr. Beaton's methods.

May I try to make my main point quite clear? In lain language, I suggest that it is time to call a halt such irresponsible treatment of mental cases as that eported by Dr. Milligan: and by irresponsible I mean king due regard and respect for the personality of the dividual patient. The very pertinent questions and iticisms of the presentation of the material and of the nger of permanent injury to the brain voiced by Dr. oley and Dr. Mather remain unanswered, but I will pursue them, because even if all were fully answered y main objection would remain, as Dr. Atkin and Dr. edham have pointed out.

Both Dr. Prestwich and Dr. Milligan appear to hold at the sole aim of treatment with the psychoneurotic atient is the removal of symptoms: but it is much sier to remove the symptoms than to cure the disease. bucket of cold water, a painful surgical illness, or posure to war dangers will remove psychoneurotic mptoms in a considerable proportion of cases: a nger in real life can take precedence of a danger in e phantasy life (conscious or unconscious), and it is sy to believe that exposure to intensive electro- nvulsive therapy may be for many patients not s alarming than aerial bombardment. Dr. Milligan nores the fact that the symptom, inconvenient as it ay be both to the patient and those about him, is the tient's attempt to adjust himself to the circumstances his life. If, as Dr. Milligan believes, the intensive ectro-convulsive treatment obliterates entirely the ulty electrical patterns in the brain, it must leave e patient either without his former awareness of the sharmony of his life (i.e., mentally deteriorated), else having that awareness but lacking any means of aling with it, and so more miserable than before. these circumstances the treatment chosen may perhaps ve been the most beneficial and convenient for the ctor, for the relatives, and for the public who have pay for it, but certainly not for the patient: and such choice is, I take it, contrary to the accepted code of edical ethics.

The alleged "resynthesis of the personality" along correct lines" can only be described as a sheer pertinence. Dr. Milligan says that "it is of the utmost portance to adopt sound psychological principles in e rehabilitation and remoulding of the patient's rsonality during the recovery period. Mere obliteration psychologically unacceptable patterns of thought d conduct is not sufficient, and the resynthesis of the rsonality requires much care and judgment"—just e that. We are asked to believe that the quickly peated passage of an electric current through the brain raculously selects and obliterates permanently the faulty electrical patterns in the brain" responsible for acceptable thought and conduct, leaving intact fter the confusion has cleared) all the apparatus quired for normal function; and further that Dr. illigan or his psychotherapeutic colleagues have been le, writing as it were on blank pages, to remould along correct lines" the personalities of some 2500 erhaps not all ex-neurotic) of the inhabitants of the strict served by his hospital. Presumably they are re-created in the image of the A.M.O., or perhaps according to a specification drawn up by the staff. Can the flight from reason go much further?

Convulsive therapy seems likely to take a permanent place in the treatment of melancholia: intensive convulsive therapy as practised by Dr. Beaton may prove useful in a few desperate cases which would otherwise require leucotomy: but I hope the Board of Control will be able to ensure that, if any attempt is made to repeat this experiment in a hospital under their care, a competent and independent assessment is made of the personality of each patient before and after treatment.

London, W.1. J. NORMAN GLAISTER.

HERNIA THROUGH THE LESSER OMENTUM

SIR,—In connexion with Mr. Leon Gillis's report in your issue of July 13 of a case of hernia through the foramen of Winslow into the lesser sac of peritoneum, the following case is of interest.

A guard-man, aged 34, gave a history of 4 days' severe right upper abdominal continuous pain with periodic added colicky spasms. There had been retching, but only in the last twelve hours had he been sick. The bowels had not been opened for three days, but during this time he had been in bed in sick quarters. There was no relevant previous history. He had never had indigestion.

On examination he was extremely muscular and well built. The whole abdomen was guarded, but in the right subcostal region and the right iliac fossa there was well-marked rigidity. Intestinal sounds were present but subdued. Nothing abnormal was detected per rectum. Temperature 99° F, pulse-rate 104 per min.

A leaking ulcer was diagnosed, and under gas-oxygen and ether anæsthesia an upper right paramedian incision was made. There was free fluid in the abdomen, and grossly distended small intestine was traced to a hole in the gastrohepatic omentum just to the left of its free margin.

The orifice was stretched digitally, and a large loop of gut, in an early stage of strangulation, was drawn out of the lesser sac of peritoneum. A few moments' treatment with hot saline packs showed its viability, but an early ulcerated area, where the margin of the orifice had pressed on the wall of the bowel, required oversewing. Two stitches were used to close the offending hole in the omentum, and the abdomen was closed.

The patient made an uninterrupted and rapid recovery. Seen three months later, he was in good health and was returning to his unit.

It was thought that the hole in the lesser omentum may have been due to some trauma, but on questioning the patient closely after the operation no such history could be obtained. His main sport was tug-of-war, in which he pulled in a champion team, but it is difficult to see how this exercise would have caused a rupture of the affected omentum.

Leatherhead Emergency Hospital. STANLEY O. AYLETT.

TICK PARALYSIS

SIR,—A form of tick paralysis due to *Ixodes holocyclus* is of considerable interest and importance in the eastern coastal regions of Australia, causing paralysis and death among domestic animals and man. All domestic animals have been affected but dogs are the chief victims. There have been a number of human cases, some fatal (Hamilton, D. G. *Med. J. Aust.* 1940, i, 759).

In your leading article of May 25 you stated that "salivary glands have been suggested as the source of the toxin, on the basis of hypertrophy of the alveolar cells observed during engorgement; this mechanism has not been confirmed, although it would explain (as does the ova hypothesis) the incubation-period." Investigations in Australia by Clunies Ross (*J. Coun. sci. industr. Res. Aust.* 1935, 8, 8) and by Oxer and Rickardo (*Aust. vet. J.* 1942, 18, 194) have shown that the salivary glands of the tick are sources of the toxin. Glands taken from engorged ticks and injected into mice produce typical tick paralysis. This method has been used to determine the titre of antitoxic serum from immune dogs. This serum is used for treatment of cases of tick paralysis in dogs, and has been used with success in several human cases.

HUGH McL. GORDON.
McMaster Animal Health Laboratory, University of Sydney.

---

[1] Huggins, C., Moulder, P. V. *Cancer Res.* 1945, 5, 510.

Obituary

EDWARD NEWBURY THORNTON

K.B.E., M.R.C.S.

Sir Edward Thornton, formerly chief medical officer for the Union of South Africa, whose death was announced in our last issue, was born at Sporle, in Norfolk, in 1878. Educated at Cheltenham College, he took the Conjoint qualification from the London Hospital in 1902, after serving as an assistant medical officer in yeomanry hospitals during the Boer War in 1900–01. In 1903 he returned to South Africa to serve as a medical officer in Cape Colony, and seven years later, on the formation of the Union, he was appointed medical adviser to the Cape provincial administration.

In the war of 1914–18 he served as medical officer in the South-West campaign before coming to England to command the South African Hospital at Richmond, where he introduced a vocational training scheme which was later extended to all military hospitals in the United Kingdom. For his services he was appointed O.B.E. in 1917, C.B.E. in 1918, and K.B.E. in 1919.

In the following year he returned to South Africa to take up the appointment of senior assistant medical officer for the Union and of director of the medical services of its Defence Forces. In 1920 he visited Nigeria and in 1930 Uganda to advise their governments on plague. Two years later he became secretary for public health and chief health officer of the Union, and he held these posts till he retired in 1936. But as chairman of the Peri-Urban Areas Health Board he continued to serve the Union, and during the last war, as acting director-general of medical services, he fostered the use of occupational therapy in its military hospitals.

Especially interested in housing and in social medicine, Sir Edward published, with Manfred Nathan, K.C., an extensive commentary on the public-health, housing, and slum Acts of the Union, which is widely used as a reference book. He also sponsored the District Surgeons and Midwifery Act, which enabled the Union government to subsidise these services and made it possible for local authorities to introduce and extend them, especially in rural areas. A man of personal integrity and honesty of purpose, he had a real interest in all things concerning public health and social welfare, and he achieved much in the service of the people of South Africa.

A. J. O.

LEROY UPSON GARDNER

M.D. YALE

Dr. L. U. Gardner, who died on Oct. 24, at the age of 57, had made himself a leader in experimental research in silicosis and had won an international reputation for his laboratory at Saranac Lake, in the Adirondack Mountains. Here, as director of the Trudeau Foundation, he was an outstanding figure among a famous team which included such men as Baldwin, Lawrason Brown, Heiser, and Sampson; and the little town owed much of its atmosphere of friendliness and earnest truth-seeking to his large-mindedness and integrity.

Born in New Britain, Connecticut, Gardner took his medical degree at Yale University in 1914, and after serving in the army medical corps he returned there as assistant professor of pathology in 1917. Two years later his long association with the Trudeau Foundation began when he was appointed pathologist at Saranac. In 1927 he became director of the Saranac laboratory and in 1938 director of the foundation. Three years before he had been awarded the Trudeau medal for his work on the pathology of tuberculosis and its relation to silicosis, and in 1940 he received the William S. Knudsen award for his research into the control of silicosis. In the same year Yale conferred on him the honorary degree of M.S.

Recalling a visit to Saranac, Prof. E. L. Collis writes: "Gardner had already embarked upon his research into the reactions of the human body to its environment, as exemplified by the inhalation of industrial dusts. First came silica, concerning which, although working independently of Kettle, he showed how, by animal experiments, whorled pulmonary fibrosis could be induced. Hardly a year passed without him giving further valuable additions to our knowledge on the pneumoconioses. He tackled asbestos dust and brought to light its toxic powers. Hard, resistant carborundum—carbide of silicon—followed, only to be found innocuo Then he studied the anthracosis of coal-miners demonstrated its entity. But probably his most re work on aluminium dust will be longest remembered his credit. Here was a metallic dust which he found only to be in itself harmless but to possess powers rendering the deadly silica dust innocuous if inha with it, and even to assist in its elimination from lungs if inhaled after the silica dust has already b deposited in the pulmonary tissues."

"Gardner gave the impression that he just could help being a great man, but never that he was striving eminence," writes A. I. G. McL. "In the States, wh dynamic personalities are common, he appeared indol by contrast—not with the indolence of a Sir Per Blakeney, but with the massive calm of a Red Indi brave. But despite this apparent inertia his output w prodigious and of first-rate quality. Tall and commanding in presence, friendly and humorous, he was the id chief because he always had time for the problems of h staff. I remember a 20-mile night drive with rattling ty chains at a temperature of 40 below to a medical meetin in another small town in the snow mountains. Th papers read at the meeting were diverse and patchy, bu Gardner summed them up at the end concisely with warm friendliness which must have raised the temperatur one or two degrees. His clear, strong, honest prose styl mirrored his mind, and he had no use for the long or redundant word. Only recently I heard two people say of one of Gardner's statements—'Well, if Gardner says so, it must be right.' I think the remark would have pleased him."

LUDWIG JULIUS BRUEHL

M.D. BERLIN

Prof. L. J. Bruehl, the well-known marine biologist, died at Muheza, Tanganyika Territory, on Oct. 11 after a distinguished and eventful career. Born at Breslau in 1870, he studied medicine at Berlin University, where he obtained his doctorate *summa cum laude* in 1893. From 1894 he was an assistant at the institute of physiology in that university, till in 1903 he was appointed to the newly founded Institute and Museum for Maritime Sciences in Berlin. There he built up the sea-fishery and other departments, becoming curator in 1909, a position he held until his retirement in 1930. During the first world war, while serving in a military hospital in East Africa, he was taken prisoner by the British in 1917 and repatriated under a Red Cross exchange system a month before the Armistice. In 1919 he was appointed to a chair at the institute and later became assistant director. He also held lectureships at the Landwirtschaftliche Hochschule and the Orientalische Seminar for tropical fishery. After his retirement he was appointed honorary professor at the Landwirtschaftliche Hochschule, but on account of his Jewish descent he was forced to leave Germany in 1934.

After he settled in Tanganyika his health began to fail, and in 1938 Hitler stopped his pension; but his fortitude and sense of humour remained firm.

Births, Marriages, and Deaths

BIRTHS

BINTCLIFFE.—On Nov. 8, at Birmingham, the wife of Mr. E. Bintcliffe, M.B.E., M.S., F.R.C.S.—a son.

BOLTON.—On Oct. 29, in London, the wife of Dr. Reginald Bolton—a son.

BOOG-SCOTT.—On Nov. 8, the wife of Dr. T. M. Boog-Scott—a son.

McLARDY.—On Nov. 4, in London, the wife of Dr. Turner McLardy—a daughter.

MARRIAGES

LOCKHART-MUMMERY—CRERAR.—On Nov. 5, in London, Hugh Evelyn Lockhart-Mummery, F.R.C.S., to Jean Crerar.

DEATHS

HOUGHTON.—On Nov. 7, at Farnham Royal, Bucks, Colonel George John Houghton, D.S.O., L.R.C.P.I., late R.A.M.C., aged 73.

HUXLEY.—On Nov. 5, Henry Huxley, M.R.C.S., of Shackleford, Godalming, aged 81.

KIRKLAND.—On Nov. 7, at Cheltenham, Robert Kirkland, M.B. Glasg., aged 88.

LINDSAY.—On Nov. 9, in London, John William Lindsay, M. Aberd., aged 71.

O'REGAN.—On Nov. 3, at Whitchurch, Glam, William Frankl O'Regan, M.B. N.U.I.

WILMOT.—On Nov. 6, Philip McKinnell Corbould Wilmot, M.B. Lond., aged 80.

Notes and News

PPOINTMENTS FOR EX-SERVICE SPECIALISTS

E new arrangements for increasing the number of alist hospital posts, which were outlined in a recent issue,[1] now been officially announced. The aims, according Ministry of Health circular (202/46), are to overcome the ulty of demobilised specialists who now cannot secure civilian appointments, and to obviate the risk of their o specialist service in the National Health Service. General itals in which the volume of work would justify an ase are invited to submit a proposal for the creation of tional posts for ex-Service specialists, at salaries of about 0 a year; if the proposal is approved the Minister will e himself responsible for the cost of salaries and emolu-ts until the National Health Service comes into operation. pitals are asked to seek the help of the appropriate ersity in the selection of candidates from the short list en by the hospital authority or governing body. For junior specialist the duration of senior B1 appointments, 550 a year, is to be extended; the scope for further itions to their number is restricted, but as far as possible are to be increased.

MEN AND MEALS

EASED perhaps by the adequate but uneventful feeding he past six years, Sir William Savage has been looking the diet of our remote ancestors.[1] They hardly seem ave done much better. The men of Java, Piltdown, and ing had characteristics in common with the apes—small rly developed brains, thick skulls, and teeth intermediate reen the stout weapons of the gorilla and the more modest tures now current. Their palates were large in proportion heir brain area, suggesting a crude not highly nutritious

ress at this time was probably slow in food habits, William suggests, as in everything else. "Man ate any-g he could get hold of and used sticks, stones and later ped stones as aids to kill animals. He ate his food raw chewed it well, giving up teeth as weapons of offence" ing rewarded for his forbearance by getting a lighter jaw. kind of feeding probably went on for something like a rter of a million years, by which time the old stone age e survivals of which linger in backwaters today) had n, and Neanderthal man, a brutal type, was occupying h of Europe. He had plenty of tools to help him to get d—axes, borers, scrapers, hammer stones, spears, assegais, s, and at last harpoons. He grew no crops, however, had no domestic animals bred in captivity. He used but no cooking pots; so as a cook he probably stuck to simple roast. But in the main his food was fish, fruits, bs, shellfish, and wild honey, all gathered with great ible. Food, indeed, was his predominant quest: a fish e would have been child's play to him; he was never of the next meal.

he last traces so far found of the old stone age date from t 10,000 B.C., while the earliest traces of the new stone are some 4000 years younger. In that short interval (as isation goes) man had taken a turn for the better in most gs, including his diet. Cave-dwelling Neanderthal man hought to be outside the direct line of ancestry of *Homo iens*, who now appeared, with his husbandry, his herds, fine cooking pots, and his use of copper. Stone tools, ground and polished, gave way without a break to bronze s and weapons; dogs, cows, sheep, goats, and pigs were t, and stalled in the pile-dwellings built in lakes. Barley, at, and millet were planted in the spring, and corn hers and mealing stones were used. Peas were cultivated, wild fruits used freely. These, with meat, fish, eggs of wild ls (no fowls were kept), milk, and honey made up a good ugh diet; the bronze age hardly improved on it, though domestication of the horse, better ploughs, hand-mills for ding corn, and more cereals—oats, rye, and winter wheat ust have made food-getting easier.

he balance of these ancient diets may not always have n very good; Sir William remarks regretfully how often grain-eaters in peaceful communities were overthrown by at-fed nomads with no settled habits. Too much cereal, points out, encourages dental caries and means calcium vitamin deficiencies, especially for children. He ends with some lively speculations about the ancient Israelites who, on one historic occasion, ate quails and died "while the flesh was yet between their teeth, ere it was chewed." The tired quails, he argues on good grounds, had fed thoughtlessly on hemlock before they were eaten in their turn.

Lancet, Oct. 26, p. 610.

rchæology and Food. Presidential address reprinted from the *Proc. Somerset Archæolog. Nat. Hist. Soc.* 1945, 91, 59.

University of Oxford

Four scholarships, each of £100 per annum, have been endowed by Lord Nuffield for women studying medicine at Oxford. The scholarships will be tenable during the pre-clinical course, and, in the case of women proposing to specialise in obstetrics, gynæcology, or ophthalmology, also during the clinical course.

University of Cambridge

The following degrees were conferred on Nov. 2:

M.D.—M. A. Rushton.
M.B., B.Chir.—J. W. Ker (by proxy).

University of Sheffield

Dr. D. R. Wood has been appointed lecturer in pharmacology, Dr. J. F. Goodwin research fellow and tutor in therapeutics, and Dr. Margaret H. Miller research assistant in medicine.

Royal College of Physicians

The Croonian lectures will be delivered at 5 P.M. on Tuesday, Dec. 3, and Thursday, Dec. 5, by Dr. H. L. Marriott, whose subject will be Some Quantitative Considerations regarding Depletion of Tissue Fluid and Blood Constituents. The FitzPatrick lectures will be delivered at 5 P.M. on Tuesday, Dec. 10, and Thursday, Dec. 12, by Sir Arthur MacNalty, who will speak on the History of State Medicine in England.

Royal College of Surgeons of England

A New Zealand industrialist has made an anonymous gift to the college for the endowment of a Commonwealth travelling professorship. The endowment will provide an income of about £2000 a year, and the benefaction is to be known as a gift from "a New Zealand Family." A Commonwealth professor will be appointed each year and will generally be a physician, surgeon, or scientific worker resident in Great Britain or in Australia or New Zealand. The appointing authorities are also empowered, however, to elect as professor a distinguished teacher from one of the other Dominions. He will be required to travel to Great Britain, or to Australia and New Zealand, or to any other Dominion, to assist in the advancement of medical science either by lecturing, teaching, or research.

Royal College of Physicians of Edinburgh

At a meeting of the college on Nov. 5, with Dr. D. M. Lyon, the president, in the chair, the following were introduced and took their seats as fellows:

Dr. A. M. Gillespie (Edinburgh), Dr. A. M. MacDonald (Edinburgh), Dr. R. A. Miller (Edinburgh), Dr. G. O. Horne (Edinburgh), Dr. R. J. Kellar (Edinburgh), Dr. G. D. Malcolm (Bridge of Earn, Perthshire), and Sir Andrew Davidson (Edinburgh).

The following were elected fellows:

Dr. H. J. Parish (Petts Wood, Kent), Dr. P. V. Pritchard (London), Dr. R. C. Wood (Edinburgh), Dr. P. N. Bardhan (Ferozepore, Punjab), Dr. H. M. D. Shepherd (Shanklin, I. o. W.), Dr. J. A. Malloch (Edinburgh), Dr. J. W. D. Goodall (I.M.S.), Dr. John Mackay-Dick (R.A.M.C.), and Dr. D. M. Anderson (Braintree, Essex).

The following were elected members:

Dr. Albert Rabinowitz (Johannesburg, S.A.), Dr. Andries Brink (Germiston, S.A.), Dr. Walter Henderson (Edinburgh), Dr. J. H. D. Millar (Edinburgh), Dr. R. H. M. Ross (Darlington), Dr. L. S. Prasad (Bihar, India), Dr. N. S. Gordon (Edinburgh), Dr. G. H. Armitage (Cumnock, Ayrshire), Dr. M. M. Whittet (Glasgow), Dr. Elizabeth M. Hislop (Edinburgh), and Dr. Ian Wang (Edinburgh).

The Cullen prize for 1946 was awarded to Lieut.-Colonel W. F. Harvey. The Hill Pattison-Struthers bursaries in anatomy and physiology were awarded to Mr. M. C. Berenbaum and Mr. James Jackson; and the Hill Pattison-Struthers bursary in clinical medicine to Dr. J. L. Quartey-Vanderpuije.

Royal Faculty of Physicians and Surgeons of Glasgow

At the annual meeting of the faculty Dr. G. B. Fleming was elected president; Mr. J. Scouler Buchanan, visitor; Mr. W. W. Galbraith, treasurer; Dr. A. L. Goodall, librarian; and Mr. Andrew Allison, representative on the General Medical Council. In addition to these office-bearers, the following were elected members of the council: Dr. John Gardner, Mr. A. B. Kerr, Mr. J. H. MacDonald, Dr. J. W. Macfarlane, Mr. E. G. Oastler, Mr. Charles Read, Mr. W. A. Sewell, Dr. W. R. Snodgrass, Mr. G. H. Stevenson, Mr. Matthew-White, Dr. J. H. Wright

Scottish Universities By-election

Mr. R. Scott Stevenson, F.R.C.S.E., has been nominated as Liberal Nationalist candidate. Mr. Walter Elliot, M.B., F.R.S., as already announced, is standing as a Conservative. The result will be declared on Nov. 29.

London Medical Exhibition

This exhibition, the 29th in the series, will be held in the new hall of the Royal Horticultural Society, Westminster, S.W.1, from Monday, Nov. 18, to Friday, Nov. 22. It will be open daily from 11 A.M. to 6.30 P.M.

Victor Horsley Lecture

Dr. F. M. R. Walshe, F.R.S., will deliver the seventh Horsley lecture at the National Hospital, Queen Square, London, W.C.1, on Wednesday, Nov. 27, at 5 P.M. His subject is to be the Contribution of Clinical Study to the Physiology of the Cerebral Motor Cortex, and Sir Alfred Webb-Johnson, P.R.C.S., is to be in the chair.

Chemical Society's Centenary

The Faraday lecture during the Chemical Society's centenary celebrations next July is to be delivered by Sir Robert Robinson, P.R.S., who is himself a past-president of the society. His work on electronic influences in organic chemistry is linked with the discoveries of Michael Faraday, in whose memory the lectureship was founded in 1867.

Medical Conference in West Africa

A conference is being held this week at Accra between British, French, and Belgian representatives, with Portuguese and Liberian observers, to arrange for the exchange of information and for coördination between the West African medical services.

Nuffield Scholarships for Gold Coast Officials

Scholarships in the academic year 1947–48 are to be awarded by the Nuffield Foundation to enable officers of Dominion and Colonial origin who are at present in subordinate ranks of the Colonial Service to qualify for promotion, particularly in branches where knowledge of medicine or biological subjects is required.

Scholarships in Aid of Scientific Research

The council of the British Medical Association is prepared to receive applications for the following research scholarships: an Ernest Hart memorial scholarship (£200), a Walter Dixon scholarship (£200), and four research scholarships (each £150). The scholarships are open to men or women undertaking research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease. Preference will be given to members of the medical profession. Each scholarship is tenable for nine months from Feb. 1, 1947, and a scholar may be reappointed for not more than two additional terms. He may also hold a junior appointment at a university, medical school, or hospital provided the duties do not interfere with his work as a scholar. Applications must be made not later than Dec. 28, on a prescribed form, to be obtained from the secretary of the association, B.M.A. House, Tavistock Square, W.C.1.

Joint Tuberculosis Council

At the last meeting this council adopted a report suggesting the abolition of the present system of recording cases of tuberculosis, and proposing new definitions of such words as "quiescent" and "arrested." This report will not be published until the Ministry of Health has had an opportunity to consider it. Attention was drawn to the ruling that where family allowances are received by persons entitled to financial assistance under memorandum 266/T, the 266/T allowances must be reduced by the amount of family allowance received; and the council authorised a deputation to express to the Ministry the strong view that family allowances should have no effect upon allowances granted to tuberculous persons as such. Arising out of resolutions adopted at a previous meeting expressing alarm at the probable effect of the National Health Service Bill on the tuberculosis service, it was reported that a deputation representing the Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis had met Sir Wilson Jameson, who said that there was no intention to detach preventive work from curative work, and also gave assurances on other points. The council set up a special committee to consider the establishment of a Bureau of Tuberculosis Statistics, and decided to approach the Nuffield Foundation for assistance in the project.

B.A.L. as Antidote to Mercury

According to the British United Press, a two-year-ol in Los Angeles who swallowed three tablets of bichlor mercury has recovered completely owing to the admi tion of British anti-lewisite.

More Potent Penicillin

An American company, the Heyden Chemical Corpor is now producing white crystalline penicillin which, it i can be stored dry for three years without refriger According to a B.U.P. report, the potency of this prod the greatest yet developed commercially.

The Pharmaceutical Society has decided to ask the Mi of Supply to release to the public stocks of quinine whicl been held in chemists' shops during the war.

Appointments

BANNISTER, F. B., M.D. Lpool, D.A.: anæsthetist, Chester Infirmary.

COLBECK, J. C., M.B. Lond.: E.M.S. area pathologist, West F

HAINES, R. M., M.D. Lond.: director of pathology, Chelsea Ho for Women.

MILLIN, T. J., M.B. Dubl., F.R.C.S.: genito-urinary surgeon, C Hospital for Women.

PABLOT, P. J., M.B. Lond.: medical officer, Colonial Se Mauritius.

RAFTERY, L. M. N., M.R.C.S., M.R.C.O.G., M.M.S.A.: visiting cologist, British Red Cross Society's clinic for rheum London.

SHANNON, J. W., M.B. Lond.: medical officer, Colonial Se Nyasaland.

Diary of the Week

NOV. 17 TO 23

Monday, 18th

HUNTERIAN SOCIETY
8.30 P.M. (Apothecaries' Hall, Black Friars Lane, E.C.4) Hugh Linstead, Dr. G. H. Day, Mr. Arthur Mort Mr. J. S. Walmsley: That the Advertisement of prietary Medicines is a Menace to the Public.

Tuesday, 19th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. J. Calvert Spence: Care of Children in Ho (Charles West lecture.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. J. T. Chesterman: Specimens Illustrating Inte Obstruction. (Erasmus Wilson Demonstration.)

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Pathology.* (Westminster Hospital School of Med S.W.1.) Demonstrations.

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Prof. Kemp (Copenhagen): Fifteen Years' Experienc Negative Eugenics in Denmark.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. W. N. Goldsmith: Acneiform Eruptions.

Wednesday, 20th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.30 P.M. *Proctology.* Mr. A. Hedley Whyte: Proctol Past and Present. (Presidential address.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Po Place, W.1
3.30 P.M. Mr. C. W. A. Kimbell: Medical Aspects of Life Prisoner-of-war Camp.

Thursday, 21st

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. V. Zachary Cope: Actinomycosis. (Erasmus demonstration.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Dermatology.* Cases will be shown at 4 P.M.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE
8 P.M. (London School of Hygiene and Tropical Medicine, Street, W.C.1.) Laboratory meeting.

Friday, 22nd

ROYAL SOCIETY OF MEDICINE
2.30 P.M. *Epidemiology and State Medicine.* Dr. Robert C shank, Dr. O. H. Lidwell, Mr. F. Courtney Har Dr. Joyce Wright: Modern Methods in the Cont Airborne Infections.
5 P.M. *Pædiatrics.* Cases will be shown at 4.15 P.M.

ROYAL INSTITUTION OF GREAT BRITAIN, 21, Albemarle Street
9 P.M. Mr. H. Osmond Clarke: R.A.F. Experiences of the M Treatment of Fractures. A film will be shown.

GENETICAL SOCIETY
5 P.M. (London School of Hygiene and Tropical Medicine.) Tage Kemp: Multiple Factors in Morbid Inheri Film: Fat Dwarf.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, W.C.1
4.30 P.M. Dr. P. A. Owren (Oslo): New Factors Concer the Coagulation of Blood.

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Mr. T. Holmes Sellors: Surgery of the Heart.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY
8.30 P.M. Dr. Macdonald Critchley: Sir William Gowe Biographical Study.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Dr. J. McMichael: Heart Failure.

ABSORPTION AND EXCRETION OF WATER

THE ANTIDIURETIC HORMONE*

E. B. VERNEY
M.A., M.B. Camb., F.R.C.P., F.R.S.
SHEILD PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF CAMBRIDGE

Oliver and Schäfer (1895) showed, in the anæsthetised dog, that the intravenous injection of extracts of whole pituitary gland raised the arterial pressure, the rise being of peripheral origin and lasting far longer than that after injections of extracts of the suprarenal medulla. Howell (1898) demonstrated that the pressor activity of extracts of the pituitary was derived solely from the posterior lobe, a fact confirmed by Schäfer and Vincent (1899). Schäfer and Magnus (1901) discovered that intravenous injection of extracts of the infundibular portion of the hypophysis into the anæsthetised dog produced "after a short latent period a remarkable and long-continued expansion of the kidney accompanied by a decided and often prolonged diuresis." Schäfer and Herring (1906) showed that the diuresis was essentially independent of the vascular change in the kidney, and that very often the diuresis was preceded by an inhibition of urine flow, even though the vascular conditions were throughout favourable to free secretion. Schäfer clearly recognised at this early date both the diuretic and the antidiuretic activities of postpituitary extract, and he postulated their inherence in two discrete substances.

Schäfer (1909) subjected the pituitaries of three dogs to mechanical injury or to partial destruction with a feeble thermocautery and found that in all a polyuria supervened during the 4–11 postoperative days over which the observations were made. These results gave the first clear indication of functional linkage between the kidney and the pituitary.

The clinical counterpart of these last experiments by Schäfer was revealed in Frank's (1912) observation of the frequent association of diabetes insipidus with injuries to the hypophysis; and, following Schäfer's interpretation of the results of his experiments on the dog, Frank expressed the view that diabetes insipidus in man was attributable to pathological overactivity of the pars intermedia. Von den Velden (1913) and Farini (1913), however, demonstrated the efficacy of injections of postpituitary extract in relieving the signs and symptoms of the human disease, and Von den Velden was clearly puzzled by the conflict between his results and the current interpretation of Schäfer's experimental findings. Since that time evidence has been gradually accumulating that the polyuria frequently observed to be associated with experimental or pathological lesions of the pituitary and hypothalamus is to be ascribed rather to lack of the postpituitary antidiuretic substance than to liberation or increased secretion of Schäfer and Magnus's diuretic substance, evidence which has culminated in the elegant demonstration by Ranson et al. (1938) that in the cat and the monkey diabetes insipidus is contingent on the complete degeneration or removal of the neurohypophysis.

There are two other conditions under which a profuse watery diuresis is observed: the perfusion of the dog's kidney in the isolated state (Verney and Starling 1922, Starling and Verney 1925), and the ingestion of a large volume of water by the normal mammal. The diuresis seen in the perfused isolated kidney is specifically inhibited by the addition of postpituitary extract to the perfusing blood, the fall in the output of water being accompanied by an increase both in the concentration of chloride in the urine and in the rate of chloride excretion. These effects of postpituitary extract are closely simulated by switching the head of a dog into perfusion-parallel with the kidney, the inhibition of diuresis and increased excretion of chloride then depending on the presence of the pituitary in the perfused head (Verney 1926). There can be little doubt about the substantial correctness of the view put forward at the time, that the profuse watery diuresis exhibited by the perfused isolated kidney is due to the divorce of the kidney from the inhibitory influence of the postpituitary antidiuretic substance and has essentially the same ætiology as diabetes insipidus.

But it is particularly with the profuse watery diuresis following water ingestion that I wish to deal here. The importance of the experimental investigation of the processes underlying this phenomenon resides in the possibility of determining whether the postpituitary antidiuretic substance is a hormone in the full physiological sense—i.e., whether its secretion is continually varying according to the contemporary osmotic pressure of the arterial plasma and being as continually and reversibly engaged in determining the rates of water and chloride excretion by the kidney.

LAG BETWEEN ABSORPTION AND EXCRETION OF INGESTED WATER

The response of the kidney to the ingestion of water can be accurately measured in bitches in which, by an earlier aseptic operation, the ureters have been extended to the exterior. When to such an animal, weighing about 10 kg., 250 c.cm. of water is given by stomach-tube, the resulting diuresis reaches a peak about 50 min. later. By the repetition of these observations on several animals a curve representing the group mean of the individual mean rates of secretion of urine is obtained, and the peak of this mean in experiments conducted by Klisiecki et al. (1933) lay accurately at 50 min. after the administration of the water (fig. 1).

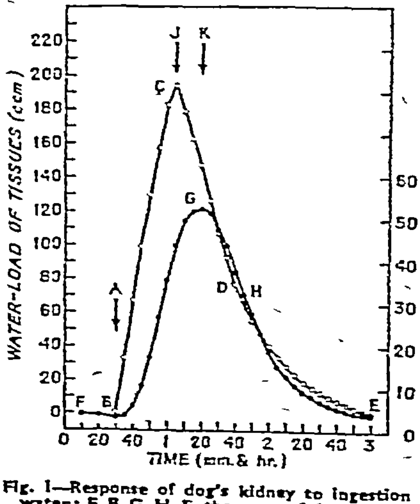


Fig. 1—Response of dog's kidney to ingestion of water: F, B, G, H, E, the mean of the mean rates of secretion in 9 dogs; B, C, D, E, water-load curve; A, time of giving water. (Klisiecki et al. 1933.)

The rate of absorption of water from the gut can be determined in the following way. When the excretion curves have been obtained, a further 250 c.cm. of water is given, and at a predetermined time after this the animal is rapidly rendered unconscious with chloroform and the heart immediately punctured through the chest wall: from the volume of water remaining in the gut the volume absorbed in the period between the giving of the water and the death of the animal becomes known. The results of ten such observations are shown in fig. 2, the time-element in each being taken as the interval between the mid-time of introduction of the water and the time of puncture of the heart. The absorption curve (fig. 2) reaches the 250 c.cm. level in 35½ min. Subtraction of the water-excretion curve (fig. 2) from the water-absorption curve gives the water-load curve (fig. 1), which represents the amount of water temporarily held in the tissues in excess of the optimal. The peak of the water-load curve precedes that of the mean rate of urinary secretion (fig. 1) by 15 min. If we regard the water-load curve as tracing the intensity of the stimulus to which the kidney eventually responds, we must conclude that there is a lag of 15 min. between the maximal intensity of stimulus and the maximal response by the kidney. The response by the denervated kidney runs exactly parallel with that of the innervated kidney. I shall consider later the significance of this 15-min. lag; in the meantime I wish to draw attention to the analysis of the inhibition produced by various agencies in the flow of urine during water diuresis, in particular to that of the inhibitory effect of (1) muscular exercise, (2) emotional stress, and (3) a rise in the osmotic pressure of the carotid arterial plasma.

---

* Abridgment of the sixth Sharpey Schafer memorial lecture, delivered in Edinburgh on June 8, 1945.

INHIBITORY EFFECT OF MUSCULAR EXERCISE ON WATER DIURESIS

To ensure that the flow of urine from the urethra is accurately conforming with contemporary secretion by the kidney, it has been found desirable, in many of these investigations, to reduce the urinary conducting tract so far as possible to simple tubular form by excising the fundus of the bladder, thus eliminating any irregularities occasioned in the recorded flow by contraction and relaxation of the bladder's musculature.

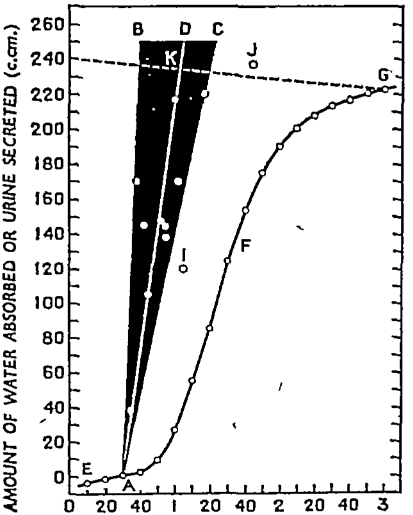


Fig. 2—Response of dog's kidney to ingestion of water: E, A, F, G, mean excretion curve, water having been given at A; white points represent volume of water absorbed from gut in allotted time; AKD, mean absorption curve (mean of lines from A through each white point). (Klisiecki et al. 1933.)

The operative procedure consists, in brief, in exposing and opening the bladder, passing down the urethra a short length of rubber catheter-tubing tied above to a short funnel-shaped glass cannula, adjusting the cannula so that its upper lip is immediately below the ureteric openings, and fixing it in this position with a ligature which encircles the urethra at the level of the sphincter of the trigone; the fundus of the bladder is then removed and the remnant closed with a single row of fine silk sutures. So far as Rydin and Verney (1938) were able to judge, such animals maintain health indefinitely; accuracy in following the rate of urine secretion is thus not made contingent on a shortening of the animal's period of survival.

It now became necessary to subject such animals to short periods of exercise and to measure continuously the effects of this procedure on water diuresis. For this purpose a moving platform was designed, the speed of which could be measured and suitably varied, the dog being tethered to the superstructure during the whole course of the urine-flow measurements.

We found that mild exercise—e.g., running at 6 m.p.h. for 4 min.—was usually followed by a well-marked and protracted inhibition of urine flow (fig. 3). During the first 2 min. of the period of exercise no fall in the rate of urine flow was observed; indeed, there was sometimes a small increase, and only during the second 2-min. period did a decrease begin, the rate falling progressively towards its lowest value. The cessation of exercise was apparently without influence on the course of the decline, and the degree and extent of the inhibition varied widely in different animals in response to running at the same speed and over the same period. The longer inhibitions were always accompanied by an increase in the percentage of chloride and of nitrogen in the urine and by a contemporary increase in urinary pigment. The variability in the inhibitory responses to a constant amount of exercise, their apparent relation in any one animal to an emotional accompaniment, and their inception by events taking place early in the period of exercise made it desirable to divorce any contribution which short exercise might make to the inhibitory effect from that due to an associated emotion. We were able to do this in three ways.

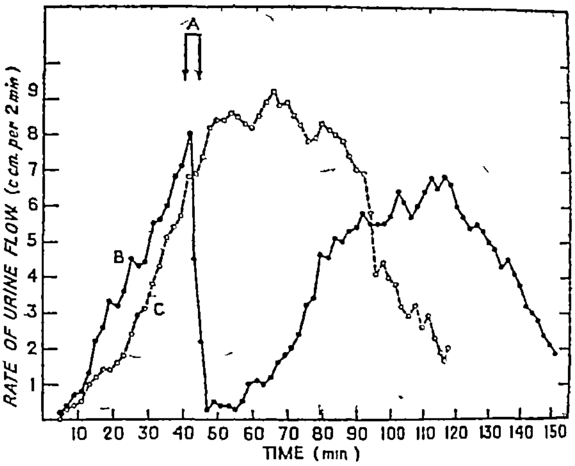


Fig. 3—Water-diuresis curves from a bitch, in which fundus of bladd was excised and urethral cannula implanted 10 days before, and 25 c.cm. of water given at zero time: B, response on August 7, 1935; C response on August 8 (response on August 6 was closely parallel wit C); *A, period of exercise, running at 6 m.p.h., during response B.* I this and all similar figures, the rate of urine flow is plotted in the *middl* of the period to which it refers. (Rydin and Verney 1938.)

EFFECT OF EMOTIONAL STRESS

First, it was easy to show that, if the animals were repeatedly exercised, the inhibitory response progressively diminished to final extinction. Muscular exercise, therefore, is not *per se* causally related to the inhibitory response; and the view that psychological factors are essentially involved is supported by the observation that inhibition has been noted on occasions when an animal resented undertaking the very exercise which had previously not elicited a response.

Secondly, if the exercise, the response to which had been extinguished by repetition, was combined with an

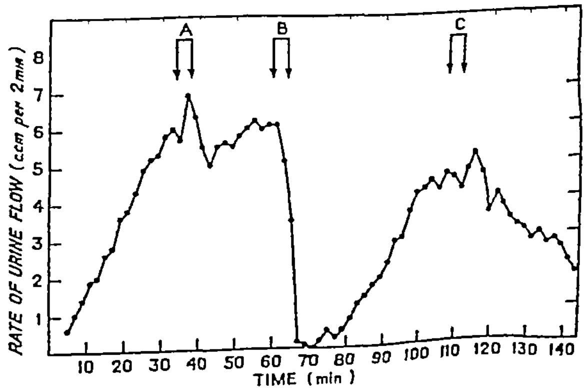


Fig. 4—Water-diuresis curve from bitch to which 250 c.cm. of water was given at zero time. During periods A and C the bitch ran on the platform quite happily. During B the same exercise was given and the bitch frightened by the repeated soundings of a car-horn. (Rydin and Verney 1938.)

unfamiliar and ugly sound, the inhibitory response reappeared. In the experiment charted in fig. 4 the animal was subjected to three similar periods of familiar exercise (A, B, and C); but, whereas during A and C the exercise was simple, during B it was combined with the repeated sounding of a car-horn, to which the animal exhibited fright. There can be no question, therefore, that the inhibitory response which began during B was due not to the exercise but to its emotional accompaniment.

We were thus led, in the third place, to measure the effect of emotional stress alone. For this purpose a weak faradic current was carried to the subcutaneous tissues by surgically clean needle electrodes, and its rength was increased until the animal showed signs resentment. Such a stimulus produced inhibitory sponses indistinguishable from those already described. nd in later experiments this simpler and more con-ollable form of stimulus has usually been used for the nalysis of the resultant inhibition.

How, then, does emotional stress produce this nhibition? The first suggestion is that the inhibition of vasomotor origin, with consequent constriction f the vasa afferentia and a fall in the glomerular capillary ressure, though the rise in the chloride concentration of he urine during the inhibition argues against such inter-retation. The suggestion is, however, disproved by the fact that after denervation of the kidneys the form of the inhibitory response is apparently unaltered. There is a rise in arterial pressure during the emotional stress: hence in the absence of any change in the composition of the blood it is reasonable to infer that, after denervation of the kidneys, at least no fall in glomerular capillary pressure results from the stress.

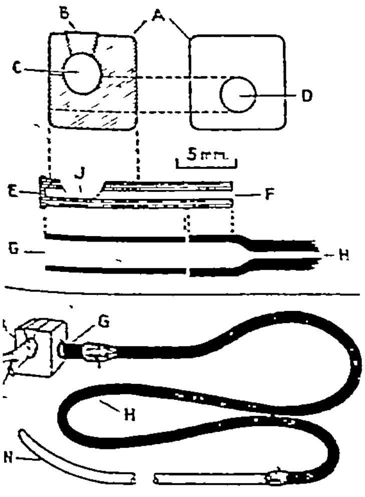


Fig. 6—Compression unit for renal artery. In the upper part are shown the component parts of the unit; in the lower part, and on a smaller scale, the parts assembled: A, bakelite cube; B, wedge; C, channel for renal artery; D, channel for silver tube E-F; J, sector removed from silver tube; G, thin rubber tube; H, pressure-tube extension of E-F. To assemble these parts the thin rubber sleeve G is slipped over E-F into the position indicated, and the unit so formed is then passed through the channel D. Into this it fits tightly, and the circumference of the opening J corresponds in position to, and slightly outruns, that of the arterial channel C in its lower part. Round the sleeve G are tied two ligatures, one on either side of the bakelite cube, and the lumen F is filled completely with 0·9% NaCl. The pressure-tube extension H, already filled with saline, is now slipped over the open end of the silver tube and tied there securely. A fine needle is then pushed into the lumen of H near its lower end and a little fluid withdrawn with a syringe. The sleeve G thereby collapses into the sector J and frees completely the arterial channel C. N, thin steel rod; L, renal artery with its two primary branches. Before use the unit is tested and calibrated by determining the volume of fluid which it is necessary to inject into it to stop the flow of water perfused under a pressure of 140 mm. Hg through a length of rubber tubing temporarily resting in the arterial channel C. We have used two sizes of unit, the diameter of C being 3·5 mm. in the one and 4·0 mm. in the other. (Rydin and Verney 1938.)

But, it will be said, adrenaline was released during the period of stimulus, and this adrenaline, especially after division of the renal nerves, led to vasoconstriction in the kidney. This perfectly valid criticism collapses when put to the test of experiment. In fig. 5 are given two responses to emotional stress in one animal. A month after the kidneys had been denervated the response B was obtained. Next day the right suprarenal was removed and the left denervated. Five days later the response C was obtained. There is no essential difference between the forms of the two responses, and during the following 16 days seven other responses of similar type were obtained. If, then, we assume that the liberation, by emotional stress, of adrenaline from the suprarenals is mediated only by the gland's nerve-supply, and that no other agent is liberated in effective vasoconstrictor amount, we are led by these results to infer that the inhibitory response observed in the normal animal is conditioned neither by the secretion of adrenaline nor by a fall in the rate of renal blood-flow.

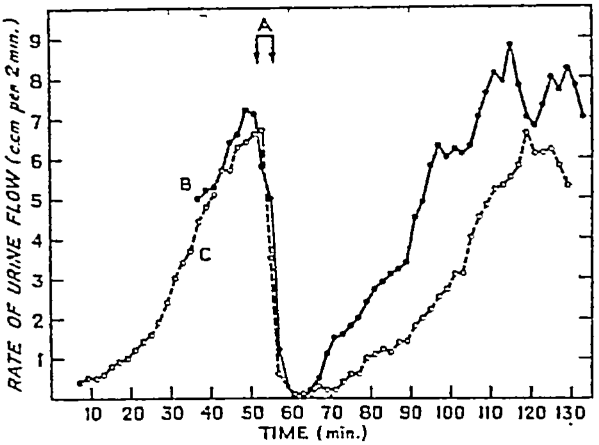


Fig. 5—Water-diuresis curves from bitch (kidneys denervated) to which 250 c.cm. of water was given at zero time in curve C, and at 31 min. in curve B. During period A the animal ran on the platform and was angered by noise. Curve B was obtained 1 day before, C 5 days after, the right suprarenal gland had been removed and the left denervated. (Rydin and Verney 1938.)

Dissimilarity to the Inhibition Produced by Temporary Compression of the Renal Artery.—The possibility of there being a causal relationship between changes in renal blood-flow and the inhibition of urine flow by emotional stress has also been questioned in another way.

A small compression unit was designed (fig. 6) which could be implanted by aseptic operation at the origin of the right renal artery, the left kidney being removed at the same time, and could temporarily arrest the renal blood-supply later without the animal being aware of the fact. The effect of this procedure on the course of water diuresis was determined. The implanted unit becomes snugly ensheathed in a thin capsule of fibrous tissue, and its presence is without apparent influence on either the animal's normal health or its survival period.

Fig. 7 shows the effects of $2\frac{1}{2}$ and 3 min. periods of occlusion of the renal artery. On release of the compression the urine flow suddenly mounts to at least its

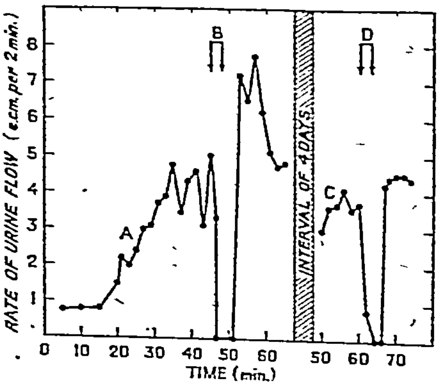


Fig. 7—Effects of temporary compression of renal artery on water diuresis in normal dog. Each rate of urine flow is plotted at the end of the period to which it refers. In each experiment 300 c.cm. of water was given by stomach-tube at zero time, a preliminary hydrating dose of 250 c.cm. having been given 4 hours previously in the first experiment and $2\frac{3}{4}$ hours previously in the second. B, D, periods of compression of renal artery. (Rydin and Verney 1938.)

rate before the artery was occluded; this takes place irrespective of whether the inhibition of urine flow is complete from severe compression or partial from moderate compression of the renal artery. The character of the response thus becomes sharply differentiated from that resulting from emotional stress and supports the evidence already adduced for the view that the response to emotional stress is not determined by hæmodynamic factors.

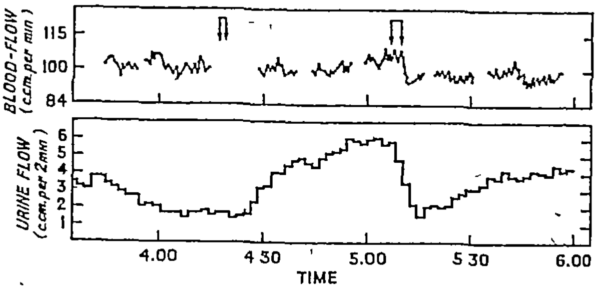


Fig. 8—Blood-flow and urine flow through denervated kidney in a dog subjected to emotional stress. Between the first pair of arrows 250 c.cm. of water was given by stomach-tube; between the second pair the animal was annoyed by mild faradic stimulation. (Cowan, Verney, and Vogt, unpublished observations.)

Measurement of Renal Blood-flow during Emotional Stress.—Some years ago Dr. S. L. Cowan, Dr. M. Vogt, and I decided to attempt the direct measurement of the blood-flow through the kidney during the inhibition from emotional stress, and the results demonstrated the essential correctness of the inference drawn by Rydin and myself from evidence of an indirect nature. The results have not yet been published, but Dr. Cowan and Dr. Vogt have very kindly allowed me to present the essential features † of the work which we did together.

We have used Rein's (1928, 1929a and b, 1931) thermostromuhr method, the thermostromuhr unit being a modification of that designed by him. It is made from a bakelite block and is a little longer than Rein's, so that the thermocouples are further from the ends, and the risks of small displacements of the unit and consequent variations of thermal contact with a wall of a blood-vessel are reduced. The heating and galvanometer leads are enclosed in very fine rubber tubes, and the whole unit can be sterilised by boiling. An approximate calibration of the instrument was made before use by placing a strip of artery inside it and perfusing this with defibrinated blood; and an accurate calibration curve was obtained, after the animal had been killed, by perfusing the renal artery in situ, a calibration which was facilitated by the addition of a little chloral to the blood to inhibit spontaneous contractions of the artery (Petersen 1936).

In the preparatory operation one kidney is removed and the stromuhr is slipped on the renal artery of the other close to its origin. The galvanometer leads are passed down one uterine horn, the heating leads down the other, and thence they pass through the uterus to the vagina, where they remain accessible for the purpose of future blood-flow measuremen The fundus of the bladder is excised and a self-retainin catheter left in the residual stump. The abdomen is th closed. Recovery is rapid and uneventful, and all ou observations have been made on animals in a state of excelle health.

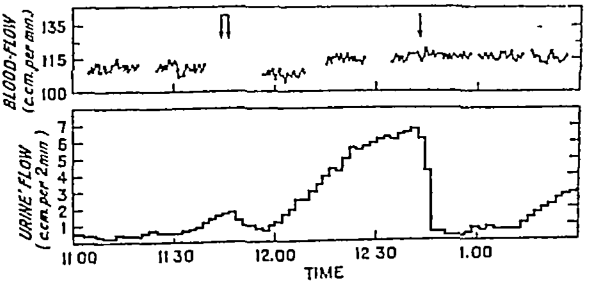


Fig. 9—Further observations on the animal from which the results in fig. 8 were obtained. Between the first two arrows 350 c.cm. of water was given by stomach-tube. At the third arrow 4 mU of postpituitary extract was given intravenously. (Cowan, Verney, and Vogt, unpublished observations.)

Fig. 8 shows the course of the renal blood-flow durin an experiment in which an inhibition of water diuresi was produced by emotional stress. In this animal th stromuhr had been implanted on the right renal artery the right suprarenal and the left kidney had been remove and the left splanchnic nerves divided at the sam operation. There is a small fall in blood-flow, and i was found that this small fall might outlast the retur of diuresis, but the fall was usually less than the change in flow developing spontaneously in the course of a experiment. Such changes were of the order of 10 and were encountered even when the animal was standin still; they were unaffected by the giving of water b mouth or by small doses of postpituitary extract intra venously (fig. 9). An intravenous injection of adrenalin 10 μg., on the other hand, produced a well-marked bu transitory fall in blood-flow.

In connexion with this work two points must b emphasised. (1) By 4–5 days after the operation th unit had become snugly ensheathed in a thin fibrou capsule, which immobilised it on the arterial wall an so minimised any changes in galvanometer deflectio from variations in thermal contact between the thermo couples and the arterial wall. The unit remained s protected and immobilised during the final calibration which was carried out immediately after the animal ha been killed. (2) The health of the animals on which ou observations were made was in every respect excellent These results, then, afford direct evidence for the view that the inhibition of water diuresis by emotional stres is independent of changes in renal blood-flow, the small changes observed being incidental rather than causal.

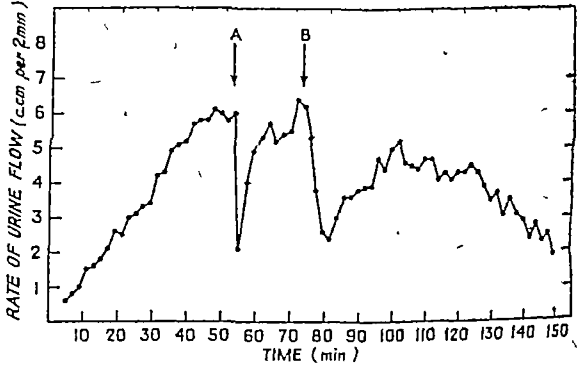
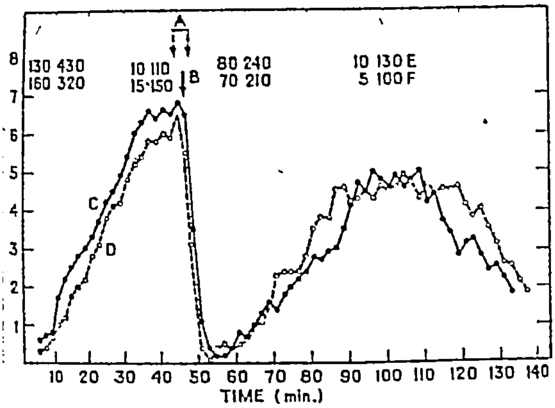


Fig. 10—Water-diuresis curve from bitch in which both kidneys had bee denervated 16 days before and 250 c.cm. of water given at zero tim At A, 1 c.cm. of 0·9% NaCl containing 0·02 mg. of adrenaline HCl and at B, 1 c.cm. of 0·9% NaCl containing 10^{-3} c.cm. of standardise postpituitary extract (10 U/c.cm.) was injected intravenously. (Rydi and Verney 1938.)

Comparison of Inhibitory Response to Emotional Stres with that to Intravenous Injection of Adrenaline and o Pituitary (Posterior Lobe) Extract.—These facts having been established, it became of interest to compare the inhibitory effect of transient emotional stress with that of the intravenous administration of the two endogenous agents, adrenaline and postpituitary extract. Curves typical of the effects of these two drugs are shown in fig. 10, and the forms of response remain true to type in whichever order they are elicited on the plateau of diuresis. The response to adrenaline, by its sudden fall and almost equally sudden recovery, is quite unlike that to emotional stress. When, however, the response to emotional stress is compared with that to postpituitary extract, so close a correspondence is obtained

---

† These were communicated to the Physiological Society on March 12, 1938.



11—Water-diuresis curves from bitch, curve C being obtained on lov. 21, curve D on Nov. 25, 1935. The kidneys had been denervated n Oct. 14; right suprarenal gland removed and left denervated on lov. 15. At B, during the course of C, 5 × 10⁻⁴ c.cm. of postpituitary xtract (10 U/c.cm.) was injected intravenously. At A, during the ourse of D, the animal was angered by noise. E, chloride (as NaCl) in mg./100 c.cm. urine, and nitrogen in mg./100 c.cm. urine, at four periods during the course of experiment C; F, corresponding figures during the course of experiment D. (Rydin and Verney 1938.)

th in the courses of urinary water and in those of urinary loride and nitrogen as to encourage the belief that the o phenomena have the same immediate cause. Indeed, th a suitable dose of postpituitary extract the two sponses are indistinguishable (fig. 11), and with each ere is a latent period of some 2 min. before the inhibitory sponse begins. Such a dose of postpituitary extract ves the arterial pressure unaffected, and the absence change in renal blood-flow (fig. 9) gives to this agent an ditional qualification for identity with that responsible r the inhibition from emotional stress.

But a resembling relationship between phenomena es not carry the conviction of causal identity, and it came imperative to obtain direct evidence on the estion of such identity by measuring the response emotional stress before and after removal of the sterior lobe of the pituitary. This has been attempted O'Connor and Verney (1942), and we have used chner's (1912) original method of approach to the tuitary through the basisphenoid.

Effect of Removal of Posterior Lobe of Pituitary on hibition of Water Diuresis by Emotional Stress.—he results we obtained were unequivocal, in that the sponse to emotional stress after removal of the posterior be of the pituitary was very much reduced when mpared with that before removal. Assay, in terms postpituitary extract, of the responses before and after moval of the posterior lobe showed that only about 5% of the antidiuretic function of the neurohypophysis, as expressed in the inhibition by emotional stress, remained when the posterior lobe had been removed. Before removal of the posterior lobe the response to the stimulus was closely matched by that to 5 mU of postpituitary extract injected intravenously (fig. 12), and a month after removal of the posterior lobe the response to the same stimulus had a value of about 0·1 mU (fig. 13), the average postpituitary equivalent of ten such tests being 0 2 mU.

In these experiments removal of the posterior lobe was followed by an increase in the daily output of urine from a preoperative value of about $^1/_4$ litre to a value of 1–2 litres for the first 2–4 days. The increase then gradually subsided, and the output of urine was apparently normal from about a week after the operation. Polyuria following operative interference with the pituitary was reported as an occasional manifestation by Vassale and Sacchi (1892) and Gemelli (1908), but Schafer (1909) first linked its appearance with the actions of posterior-lobe extract on the kidney. More recently the temporary polyuria has been observed by Fisher et al. (1938) working on the cat and by Pickford (1939) working on the dog. As much as 95% of the antidiuretic activity of the neurohypophysis, as assessed in the emotional inhibition of water diuresis, can be abolished without producing such an impairment in the animal's ability to conserve its tissue water as would be expressed in a permanent increase in urine flow.

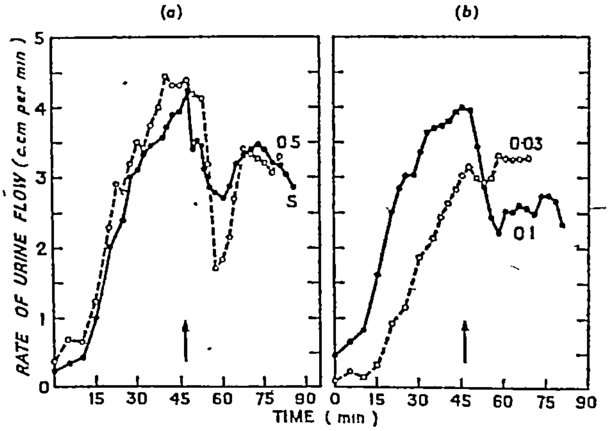
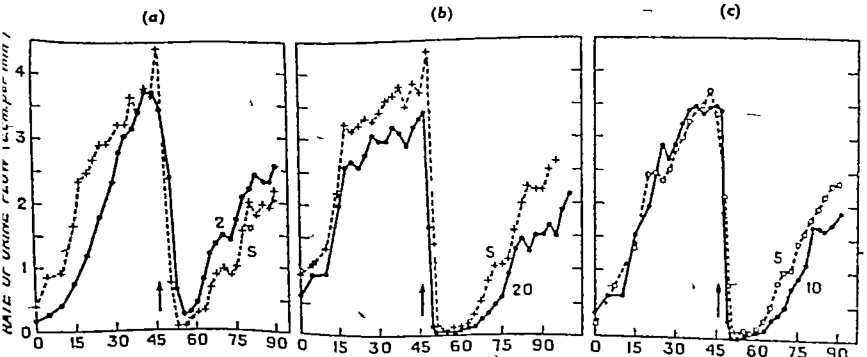


Fig. 13—Estimation of amount of antidiuretic substance liberated in response to 40 sec. emotional stimulus of same strength in same bitch as in fig. 12 but 1 month after removal of the posterior lobe: (a) inhibition resulting from emotional stimulus compared with that from 0 5 mU injected during the curve of the previous day; (b) inhibitions from 0 1 mU on the day after the curves of (a) and from 0·03 mU on the day before the curves of (a). (O'Connor and Verney 1942.)

Probable Pathway through which Emotional Stress Operates.—A study of the inhibition of water diuresis by emotional stress has, then, led to the demonstration of the release of antidiuretic substance from the posterior lobe of the pituitary when a suitable stimulus is given to the normal animal. Now, Pickford (1939) has shown that, in the atropinised dog, acetylcholine produces a temporary inhibition of water diuresis, an inhibition which no longer develops after removal of the posterior lobe. The percentage of chloride in



ig. 12—Estimation of amount of antidiuretic substance liberated in response to 40 sec. emotional stimulus before removal of posterior lobe in bitch weighing 11 2 kg. Dose of water=300 c.cm. Stimulus and injection were given at the arrow: (a) inhibition produced by emotional stress (graph S) is compared with that resulting from intravenous injection of 2 mU (graph 2); (b) another inhibition from an equal stimulus (graph S) is compared with that from 20 mU (graph 20); (c) inhibitions resulting from 5 and 10 mU. (O'Connor and Verney 1942.)

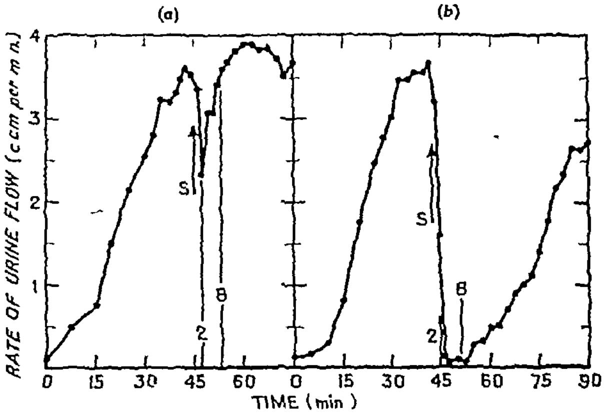


Fig. 14—Water-diuresis curves of dog weighing 10 kg.: (a) August 21, 1942, *before operation; S, 60-sec. faradic stimulation.* Oct. 28, 1942, *denervation of the kidneys* and *suprarenals.* (*b*) Nov. 24, 1942; S, 60-sec. *faradic stimulation.* (O'Connor and Verney 1945.)

the urine and the rate of chloride excretion rise during the period of inhibition of the diuresis; and there can be little doubt that the acetylcholine is producing these changes in the excretion of water and chloride by stimulating directly or indirectly the hypothalamic neurones whose axons pass down the stalk to the posterior lobe and by whose activity the pituitary antidiuretic substance is released. Equally, there can be little doubt that emotional stress produces such release by similar involvement of the hypothalamic nuclei.

Effect of Increased Activity of Sympathetic System on Inhibition.—Before leaving the subject of the inhibition of water diuresis by emotional stress, I wish to refer briefly to the relation of increased activity of the sympathetic system with this inhibition. O'Connor and Verney (1945) have found that with many dogs the response to emotional stress during water diuresis is a sharp short inhibition, that this rapid inhibition is abolished by section of the splanchnic nerves and denervation of the kidneys and suprarenals, and that then the long slow inhibition of pituitary origin invariably appears. Fig. 14 shows the rapid response of sympathetic origin, and the slow response of pituitary origin which appeared after section of the splanchnics and denervation of the kidneys and suprarenals. The slow inhibition thus revealed could be prevented by the injection of adrenaline just before the application of the faradic stimulus.

There are two possible explanations of this: either the adrenaline is interfering with the action of released pituitary antidiuretic substance on the kidney, or it is preventing the release of this substance. That the latter is the correct interpretation was shown by the fact that adrenaline did not diminish the inhibition produced by postpituitary extract. Moreover, if the adrenaline is injected 30 sec. after instead of 30 sec. before the faradic stimulus, the full inhibition of pituitary origin appears. The irregular appearance of the slow inhibition in normal dogs is thus explicable in terms of non-release of antidiuretic substance from the posterior lobe owing to increased sympathetic activity during emotional stress. The action of adrenaline in this regard is not specific, since tyramine in equipressor doses is just as effective, and it seems probable that an increased cerebral blood-flow is the common factor in preventing the release of antidiuretic substance.

Now, Rydin and Verney (1938) had observed that an inhibition of the pituitary type followed the removal of small volumes of arterial blood from animals subjected to section of the splanchnics or to a combination of this with abdominal sympathectomy, conditions which we now see to be peculiarly favourable to the release of antidiuretic substance by emotional stress. May it not be that in states of low sympathetic tone in man, associated perhaps with pathic stimuli and with hæmorrhage, the conditions are equally favourable to the pr secretion of antidiuretic substance by the pi If that is so, the beauty of the fitness of distantly eve *processes for recruitment to the current accidental* for the conservation of such water as is in excess of required for essential excretory work by the ki *becomes immediately manifest.*

The demonstration, in the normal animal, of release of pituitary antidiuretic substance by the arti *means of faradic stimulation of sensory nerves* receptors, and the fact that this release may be ca by such mild disturbance of the central nervous system comes within a physiological range—even the anticipati *of a nocuous stimulus which the animal has previous* experienced may be effective—encouraged an attem to determine whether the secretion of this substance w not continuously varying with, and under the dir control of, some factor in the animal's internal enviro ment, to the maintenance of which factor within a narro physiological range the renal secretion of water and chloride would specifically contribute.

(*To be concluded*)

LUNG LESIONS IN SKELETAL TUBERCULOSIS

REVIEW OF 500 CASES

K. J. MANN
M.D. Lond., M.R.C.P., D.T.M. & H.
PHYSICIAN E.M.S.

THE association of bone and joint tuberculosis w pulmonary lesions of the same ætiology has been rec nised for many centuries, but reliable data were available until the last few decades, with the adva in the pathology and radiological interpretations tuberculous lesions. Papers by different authors ha been published, all of which prove the intimate relati between pulmonary and extrapulmonary tuberculosis.

The present series comprises 500 cases of skele tuberculosis in patients admitted to the Royal Natio Orthopædic Hospital, Stanmore, during the last th years. These patients, generally resident in Lon and the home counties, were admitted irrespective the severity of the skeletal lesion, provided they w *known to have no open pulmonary tuberculosis.* It therefore a selected series of patients without tube bacilli in their sputum, but with recent development skeletal tuberculosis. No old cases or readmissions w included.

The diagnosis of the tuberculous nature of the bone joint lesion was made by the orthopædic surgeons charge of the cases on typical clinical *and* radiologi findings, by isolation of the tubercle bacillus from or granulation tissue, and by biopsy of tissue remo from the diseased part or its draining lymph-glands. A case where *the* tuberculous nature *of* the lesion was doubt was excluded.

Once the diagnosis of the skeletal lesion was ma each case was submitted to an investigation of respiratory system. This included history of past present symptoms referable to the chest, *present sign* the chest, radiological investigations, sputum examinat when available, and sedimentation-rate. In some ca gastric lavage and guineapig inoculation were *also* do All the cases were reviewed, clinically and radiologica at three-monthly *intervals. A post-mortem* examinat was carried out on 4 out of 8 patients, who died while hospital, to confirm the clinical findings in the respirato system.

FINDINGS

Of the 500 cases, 287 were *males* and 213 femal They were subdivided, irrespective of sex, into five-ye oups up to puberty; adolescence and early working e were taken together (15–24); the remainder were vided arbitrarily into those below and those above 40.

Age-group (yr.)		*Males*		*Females*		*Total*
0– 4	..	39	..	26	..	65
5– 9	..	47	..	29	..	76
10–14	..	36	..	20	..	56
15–24	..	77	..	69	..	146
25–39	..	64	..	49	..	113
40 plus	..	24	..	20	..	44
Total	..	287	..	213	..	500

To give a more complete picture of the material under onsideration, the tuberculous skeletal lesions from which hese patients were suffering are analysed in table I. he number of patients is smaller than the number of sions because of multiple lesions in the same patient.

Past Symptoms Referable to Respiratory System.—Of hese the only two to which clinical significance could be ttached were the history of past sanatorium treatment and that of an acute attack of pleurisy.

Past sanatorium treatment for pulmonary lesions was underone by 26 patients, 5% of the total number. In some cases he skeletal lesion developed as late as twenty years after the ulmonary lesion. In others it preceded the latter by 1–3 ears. The majority, however, came on within three years of ischarge from the sanatorium. Only 4 received collapse herapy, 3 thoracoplasty, and 1 A.P. Of the 26 patients who eceived sanatorium treatment, 12 had no active pulmonary sion clinically or radiologically when examined in the course f this investigation.

TABLE I—ANALYSIS OF TUBERCULOUS SKELETAL LESIONS

Age-roup	Spine	Sacro-iliac	Hip	Knee	Ankle	Wrist	Elbow	Shoulder	Others
0– 4	24	1	18	16	3	2	0	1	2
5– 9	20	0	41	10	5	0	0	1	1
–14	10	1	24	10	5	2	0	1	0
5–24	67	15	26	25	7	2	2	3	7
–39	61	10	8	15	5	3	2	2	12
+	24	1	9	9	1	0	1	2	2
otal	206	28	126	85	26	9	5	10	24

Pleurisy.—43 patients had an attack of pleurisy which receded the skeletal lesion by an average of two years, the ngest interval being twenty years. In some cases it was elayed 1–6 years after the onset of the skeletal lesion. Of he total number, 4 were bilateral. 24 of the 43 cases still howed active pulmonary lesions when examined.

Present Symptoms Referable to Respiratory System.—In iew of the selected series of cases, such symptoms were eagre. Cough was present in 12%, expectoration in %, and hæmoptysis in 1%.

Physical signs in the chest were present in 12% of the atients and varied greatly in degree.

Sputum tests were positive in 6 patients, who were ransferred immediately to a sanatorium.

Gastric lavage and guineapig inoculation were carried ut in a small unselected series of cases. Of 64 tests, 18 ere positive. The number of tests and results according o age-groups were as follows:

Age-group (yr.)		*No. of tests*		*No. positive*
0– 4	..	13	..	3
5– 9	..	6	..	2
10–14	..	5	..	1
15–24	..	25	..	7
25–39	..	10	..	3
40 plus	..	5	..	2
Total	..	64	..	18

he organisms isolated from the sputum and gastric avage were in all cases of the human type.

Sedimentation-rate.—The extrapulmonary lesions were usually responsible for the high readings obtained. Occasionally one could attribute the high sedimentation-rate to the pulmonary lesion, but on the whole this objective test was of no value in determining the activity or otherwise of pulmonary shadows.

Radiological Investigation.—The history, symptoms, signs, and bacteriological investigation were of little assistance in determining the presence of early lung disease. It was necessary, therefore, to rely on the radiological appearances for the diagnosis of pulmonary lesions and their classification. Radiograms were taken on admission and repeated at three-monthly intervals. Where required, penetrating and lateral films were taken to assist in the evaluation of doubtful shadows in the A.P. films. In children a negative result of radiography of the chest was not taken as final. Radiography was repeated after an interval of 3–6 months, and in a few the primary lung infiltration, which was not visible in the first radiogram, became apparent in the later ones. In the same way progression of the disease in mediastinal glands produced in a few months mediastinal shadows easily identifiable as pathological on the later radiograms. Activity in patients with negative sputum and gastric lavage was judged partly by the appearance of the radiological shadows in the first radiogram and partly by the regression or progression of these shadows in later radiograms. Only cases fulfilling the above criteria were included among those taken as showing active pulmonary lesions. Calcified lesions were interpreted as normal.

TABLE II—DISTRIBUTION OF TUBERCULOUS LESIONS

Age-group	Primary complex			Hæmatogenous foci only	Bronchogenic tuberculosis	Normal
	Lung and glands	Glands only	+hæmatogenous foci			
0– 4	35 (*54%*)	16 (*25%*)	4 (*6%*)	0	0	10
5– 9	31 (*41%*)	22 (*29%*)	5 (*7%*)	4 (*5%*)	0	11
10–14	13 (*23%*)	12 (*21%*)	3 (*5%*)	2 (*4%*)	0	26
15–24	4 (*3%*)	3 (*2%*)	6 (*4%*)	58 (*40%*)	2 (*1%*)	73
25–39	1 (*1%*)	0	0	39 (*34%*)	7 (*6%*)	66
40 +	0	0	0	10 (*24%*)	7 (*16%*)	27
Total	84 (*17%*)	53 (*10%*)	18 (*4%*)	113 (*23%*)	16 (*3%*)	216

Of the 500 patients, 284 (57%) showed active intrathoracic lesions. The percentage of lung lesions in the younger age-groups is 84, diminishing to 40 in the older age-groups, as shown by the following analysis:

Age-group (yr.)		*Total*		*No. affected*
0– 4	..	65	..	55 (*84%*)
5– 9	..	76	..	62 (*82%*)
10–14	..	56	..	30 (*54%*)
15–24	..	146	..	73 (*50%*)
25–39	..	113	..	47 (*42%*)
40 plus	..	44	..	17 (*40%*)
Total	..	500	..	284 (57%)

Types of Lesion.—As might be expected, primary infection of the lung and enlargement of the draining lymph-glands was common in the early age-groups, whereas hæmatogenous foci were seen at all ages, but especially in adults. The bronchogenic type of tuberculosis was seen infrequently, partly because these cases were denied admission to the hospital and partly because the bone lesion, being a result of a hæmatogenous dissemination, is more likely to be associated with other hæmatogenous foci in various parts of the body, including the lungs. Table II summarises the type of lesion found in the different age-groups and the percentage of that particular lesion in each age-group.

Table II shows that 31% of the patients showed one or other component of the primary complex, 27% showed hæmatogenous lesions, and 3% showed bronchogenic lesions. If these figures are analysed further, according to the total number of patients in the different age-groups, it becomes obvious that:

(1) The commonest lesion in patients under 15 years of age is the primary complex present in 70%.

(2) The younger the child, the higher is the percentage of those showing the primary complex.
(3) The younger the child, the more likely is the radiogram to show not only the large mediastinal glands but also the primary lung infiltration.
(4) The commonest lesions in adolescents and adults are the hæmatogenous foci, present in 40% of the patients over 15 years of age, only exceptions showing one or both components of the primary complex.
(5) The small number of patients with the bronchogenic type of tuberculosis are found in the older age-groups.

The significance of these findings is discussed below.

Localisation of Pulmonary Lesions.—Table III summarises the localisation of the pulmonary lesions discovered and shows that the primary lung infiltration and the adult type of tuberculosis were, on the whole, unilateral, whereas glandular enlargement and hæmatogenous foci were usually bilateral.

TABLE III—LOCALISATION OF PULMONARY LESIONS

Lesion	No. of cases	Right upper zone	Right lower zone	Left upper zone	Left lower zone	Bi-lateral
Primary lung infiltration	84	21 (*25*%)	27 (*32*%)	20 (*24*%)	16 (*19*%)	0
Glandular enlargement . .	154	33 (*22*%)		43 (*28*%)		78 (*50*%)
Hæmatogenous foci	131	21 (*16*%)	4 (*3*%)	33 (*25*%)	1 (*1*%)	72 (*55*%)
Bronchogenic	16	5 (*31*%)	0	7 (*44*%)	0	4 (*25*%)

Radiographic Appearances of Lesions.—Most of the primary lung infiltrations presented ill-defined fluffy patches of consolidation leading up by excessive bronchial and vascular shadows to the hilar region. In a smaller number of cases, well-defined shadows were seen, varying in size from a few millimetres to complete involvement of the whole lobe. If healing has taken place, calcification may be seen in these lesions. In one case cavitation occurred in the primary lung infiltration.

The glandular enlargement varied in shape in different individuals. In some it presented a local tumour projecting from the mediastinal shadow or hilum, and in others the enlargement was more diffuse, producing a generalised widening of the mediastinal shadow. These shadows were at times connected by increased bronchial and vascular markings to the primary lung infiltration. Within the shadows calcium deposits may be seen in the form of either granules or larger masses.

The hæmatogenous foci, usually small, varied in size from about 2 to 10 mm. in diameter. They were round or oval, although rectangular shadows running out from the hilum to the periphery of the lung were observed in a few cases. Although in most cases these opacities were ill defined and not homogeneous, a fair number were uniform in density and sharply demarcated from the surrounding normal lung tissue. The lesions, generally multiple, were situated in the upper few centimetres of the lungs at their periphery. In 3 patients they were universally distributed as in typical miliary tuberculosis, and in 10 only one opacity was found. In most of these cases it was well defined and placed in the infraclavicular zone. As these shadows were found in adults, and as the draining glands were not enlarged, they were taken to have originated endogenously from hæmatogenous implantation. Their origin from exogenous reinfection was considered unlikely in view of the simultaneous presence of other hæmatogenous lesions and their pathological course. A feature commonly seen with apical foci was the well-marked reticulation leading down towards the hilum and not associated with enlarged mediastinal glands. These were interpreted as vascular and lymphatic shadows accentuated by drainage of infected areas.

The bronchogenic type of tuberculosis showed the familiar features and will not be enlarged on.

Course of Disease and Prognosis.—Of the 284
who showed active pulmonary lesions, 75% have
or are healing, 15% remained stationary, and 10%
worse. In most cases healing took place by ab
calcification, and fibrosis, leaving behind sta
radiological shadows which were assumed to be he
The reticulation leading from apical foci towards
hilum was usually the last to disappear. On the ot
hand, spread of pulmonary lesions is either by dir
extension or by a new hæmatogenous disseminati
terminating in 3 cases by miliary tuberculosis.

As can be seen from the foregoing, the prognosis of
pulmonary lesions in patients with skeletal tuberculo
is good. Radiologically patients have improved
healed, although no active treatment was given for
lung lesions.

Intrathoracic Complications.—Collapse of part or
whole lobe occurred in 4 patients, aged 2, 3, 4, and 1
in 2 of these collapse was due to enlarged mediasti
glands, and in 2 to paravertebral abscesses encroachi
on lung tissue.

Pleural effusion developed in 10 patients while
hospital. In 4 it was bilateral, and all the patients a
alive and well; 3 of the patients who developed pleuri
showed active pulmonary lesions.

Tuberculous empyema was found in 3 cases. It w
localised and chronic, producing only mild gene
symptoms.

Paravertebral abscesses have burst into the pleu
cavity in 4 cases: 3 penetrating into the lung and formi
bronchopleural fistulæ in 2 cases and a lung abscess in
The abscesses originated in 2 cases from dorsal lesio
in 1 from a cervical lesion, and in 1 from an upper lumb
lesion.

Tuberculous pericarditis occurred in 1 patient, who
slowly recovering.

Necropsies.—8 patients with positive radiologic
findings in the chest died. Of these, 5 died of tuberculo
meningitis, 2 of pulmonary extension of tuberculo
disease, and 1 of pleuropulmonary fistula as a result
the extension of a mediastinal abscess.

Necropsies were carried out on 4 of these. In
aged 4, 10, and 21, a primary complex was found in t
lung. In the fourth, aged 18, only hæmatogenous f
were present, thus confirming the clinical findings.

A caseating Gohn's focus, about 1 cm. in diamet
discovered in the child aged 4, was not visible in any of t
previous radiograms, including one taken a week bef
death.

DISCUSSION

In determining the status of the respiratory system
extrapulmonary tuberculosis the radiological findin
were naturally of paramount value. It is not, therefo
surprising that the main theoretical and practical poi
arising out of this investigation should be based on the
findings, which are discussed in the following paragrap
Certain other points of interest, however, which ha
come to light from the history and other investigatio
carried out on the patients, will be commented on at t
end of this discussion.

Incidence.—The radiological findings in this seri
confirm the intimate relation between pulmonary a
extrapulmonary tuberculosis, as found by other invest
gators (table IV).

Almens and Flesch-Thebesius (1923) reported on 100 childr
with extrapulmonary tuberculous lesions, 53% of who
showed pulmonary lesions. MacKinnon (1924) reported
cases with pulmonary lesions out of 30 patients with extr
pulmonary tuberculosis. Ragolsky (1920) reported that the
were pulmonary lesions in 48 children out of 104 and in
adults out of 96 studied. Unfortunately, his figures inclu
calcified and active lesions.

Hocker (1931) found 63·6% of children with extrapulmonar
lesions to have pulmonary lesions also. Snyder (193
examined a series of adults and children with extrapulmonar

ions; 37·3% of the adults and 44% of the children had ulmonary lesions. Reisner (1934) reported on 240 cases with trapulmonary tuberculosis, 124 (51·7%) of which showed idence of active lung disease.

Meng and Chen (1935) reviewed 100 cases of extrapulmonary berculosis and found 47% of them to have pulmonary lesions. eters (1937) reviewed 95 cases, 60% of whom had pulmonary ions; and Marienfeld (1939) found 24 out of 74 with active ung lesions. Rosencrantz et al. (1941) reported 118 patients ith pulmonary lesions out of 160 with extrapulmonary lesions. Tepper and Jacobson (1943) reported 79 cases with lung sions out of 100 non-pulmonary tuberculous patients. nfortunately, here again healed lesions were included. accarezza and Gomez (1940) studied 420 cases of hæmatoenous tuberculous disease, and found 90% of them with ulmonary disease of the same ætiology.

In the present series 57% of all the patients showed ne or other form of active pulmonary disease, a figure well in agreement with those of the authors just reviewed. This high percentage of pulmonary lesions in patients presenting themselves with skeletal tuberculosis emphasises the generalised nature of tuberculosis. Further evidence of this point was provided by the bacteriological investigations of the renal tract and post-mortem material. The urine of 100 patients was examined microscopically, culturally, and by guineapig inoculation for tubercle bacilli, which were found in 16 cases. In most of these intravenous pyelography was done, and tuberculous lesions in the kidneys were demonstrated.

The few necropsies done in this series confirmed the presence of pulmonary lesions in 4 out of 8 patients and multiple tuberculous lesions in all. A larger series of necropsies on patients who died of skeletal tuberculosis was reported on by the American Orthopedic Committee in 1933; 37% of cases thus examined showed active pulmonary lesions.

The multiplicity of the lesions thus found confirms the modern conception of the natural history of tuberculosis. The importance of searching all organs liable to tuberculosis, wherever the original manifestations appear, annot be over-emphasised.

Type of Lesion.—A further point of interest is the variability of the lesion found in the lungs at the different ages. The commonest lesion in children under 15 years of age is one or other component of the primary complex, whereas later in life this lesion is seen only rarely in association with skeletal tuberculosis. Instead, the hæmatogenous type of tuberculosis is found in the lungs, with no evidence of the whereabouts of the primary lesion responsible for that dissemination.

TABLE IV—ASSOCIATION OF PULMONARY AND EXTRA-PULMONARY TUBERCULOSIS

Investigator	No. of extra-pulmonary cases	No. of pulmonary cases
Adults		
MacKinnon (1924)	30	20 (*66%*)
Ragolsky (1929)	96	62 (*64·6%*)
Snyder (1933)	51	22 (*37·8%*)
Reisner (1934)	240	124 (*51·7%*)
Meng and Chen (1935)	100	47 (*47·1%*)
Peters (1937)	95	57 (*60%*)
Marienfeld (1939)	74	24 (*33%*)
Rosencrantz et al. (1941)	160	118 (*73·7%*)
Tepper and Jacobson (1943) ..	100	79 (*37·3%*)
Vaccarezza and Gomez (1940) ..	420	378 (*90%*)
Total adults..	1366	931 (*68·1%*)
Children		
Almens and Flesch-Thebesius (1923)	100	53 (*53%*)
Ragolsky (1929)	104	48 (*46%*)
Snyder (1933)	41	18 (*47·4%*)
Total children	245	119 (*48%*)
Total adults and children	1611	1050 (*65%*)

Table II shows that the younger the child, the more likely are the primary lung infiltration, enlargement of the draining mediastinal glands, and the bone lesion to be found at the same time in the same patient. In the older child the advance of the tuberculous process from lung to glands into the blood-stream and bone is slowed down. By the time the skeletal lesion is manifested clinically, the primary lung infiltration has healed, and the enlarged mediastinal glands remain as the only evidence of the natural course of the disease. Many children and adults succeed in localising the infection to the chest. The thoracic lesion may or may not produce clinical symptoms, but in either case partial healing has taken place. A period of well-being then follows, lasting a variable number of years. With the advent of puberty and economic hardship, the primary lesion is reactivated. A series of pathological processes is started, culminating in hæmatogenous invasion and implantation in skeleton, lung, or kidney, singly or in combination.

It appears, therefore, that the skeletal lesion in children follows quickly the primary lung infiltration and is thus a true post-primary infection. In most adults, on the other hand, the skeletal lesion does not soon follow the primary infection, nor is it a recrudescence of a quiescent post-primary bone lesion. In all probability it results from a reactivation of some other quiescent focus in the body (probably a quiescent primary lesion) which causes blood-stream dissemination of tubercle bacilli and their implantation in bone and lung. This will explain the presence at the same time of the primary complex in the lung and skeletal lesions in children, and the absence of these lesions and the presence of hæmatogenous lung foci in adolescents and adults, especially in the age-group 15–24, as these are exposed to hormonal and economic factors tending to reactivate quiescent primary lesions and to precipitate blood-stream dissemination.

The bronchogenic type of tuberculosis was found in only 16 cases, partly because skeletal tuberculosis, being of hæmatogenous origin, is more likely to be associated with that or an earlier type of lung lesion, and partly because in these cases the lung lesion is the clinically important one and as such is likely to be treated in a sanatorium for chest diseases and not in an orthopædic centre.

Source and Root of Entry of Tubercle Bacillus.—A chain of events similar to that portrayed above will take place if the primary infection is extrapulmonary (mouth or gut). There is no doubt that this was so in many cases of this series, but it is a remarkable fact that such a high proportion should show their primary infection to be in the respiratory tract (see table II). This forces one to the conclusion that skeletal tuberculous infection in children in this part of England at the present time originates from primary tuberculosis in the respiratory tract, this acting as a source of organisms for dissemination by the blood and implantation in the skeleton. As the primary infection is a respiratory one, it obviously enters the lung by inhalation. This points to the human type of tubercle bacillus as the causal organism derived from human pulmonary cases.

The same process can be said to have taken place in adults, although here no direct radiological evidence is available of the route of entry. As has been pointed out, there is reason to believe that the tubercle bacilli responsible for adult lung and skeletal lesions originate in a reactivated primary infection acquired in childhood. There is no occasion to doubt that most of these were respiratory ones, as they have been proved to be in the children of this series. This is further supported by necropsies on children who died of tuberculous meningitis, an extreme example of hæmatogenous dissemination. Blacklock and Griffin (1935), who examined 241 children after death from tuberculous meningitis, found 74% with primary complexes in the lungs. Prof. G. B. Fleming (1943) analysed 100 cases with tuberculous meningitis and found 80 with primary lung infections.

The conclusion that the infecting organism is the human type of tubercle bacillus is supported by the bacteriological investigations carried out on this series by Dr. H. Schwabacher under the auspices of the Medical Research Council. The tubercle bacilli obtained from the sputum and gastric lavage were typed and, as was expected, were found to be of the human variety. More interesting and conclusive are the results obtained from typing the tubercle bacilli derived from pathological material of the skeletal lesions (pus, synovial fluid, &c.) in 88 patients. Of these, 83 (94%) were of the human variety and only 5 bovine.

It can thus be seen that the clinical, bacteriological, and pathological findings all point to the fact that most extrapulmonary tuberculous lesions in this part of England are due to the human type of bacillus, originating from contact with human cases and finding access to the body through the respiratory tract. Milk from infected cows cannot be considered any longer an important source of infection in extrapulmonary tuberculosis, presumably owing to the fact that almost all milk marketed in London and the home counties is pasteurised.

Diagnosis.—Besides the above considerations arising out of the routine study of pulmonary radiograms in skeletal tuberculosis, a great deal of help can be derived from it in the diagnosis of doubtful skeletal lesions and in the prognosis of the established disease. When the tuberculous nature of a skeletal lesion is in doubt, one may discover a pulmonary lesion whose nature is not in doubt. It can then be assumed that both lesions are of the same ætiology. On the other hand, a negative pulmonary radiogram is of little value in the adult, but its diagnostic importance increases in the younger age-groups, in whom up to 84% are expected to show pulmonary lesions, the absence of which will throw doubt on the tuberculous nature of the skeletal lesion.

Prognosis.—The prognosis of a tuberculous lesion can be judged partly by its rate of development from the time of infection to the time of clinical manifestations. If a radiogram of the chest shows the lung and glands to be involved (primary complex), one can assume a rapid advance of the disease from the primary lung infiltration into the draining glands and thence via the blood-stream to the skeletal lesion. The prognosis will correspondingly be poor. In those with a better prognosis the lung infiltration would have been absorbed or calcified, and the draining glands, although enlarged, would show various degrees of healing. Not only is the first radiogram of the chest valuable in estimating the previous course of the disease, but also routine three-monthly radiograms will follow the development of the pulmonary lesion while the patient is under treatment. These usually run a course parallel to that of the skeletal lesion. They will thus confirm the prognosis as judged from the radiograms of the extrapulmonary lesion.

Prevention.—With the knowledge of the source of infection, the route of entry, and the factors liable to cause reactivation of quiescent lesions, a scheme can be formulated for the prevention and control of extrapulmonary tuberculosis:

(1) Elimination of the source of infection by efficient treatment of sputum-positive cases. If this is impossible, contact with children should be avoided.
(2) Early diagnosis and treatment of the primary infection.
(3) Maintenance of body resistance to prevent spread of disease and reactivation of quiescent lesions.

The first and third of these are obvious and need no further comment. The second, however, is worthy of emphasis, as so many authorities have expressed doubt about the desirability of treating the primary infection in children. Although in most of these the infection will run a benign course, some will develop [illegible] tuberculosis. It is felt, therefore, that early trea of the primary infection will pay the community great reduction in morbidity and mortality of pulmonary tuberculosis.

The pulmonary radiological findings have thus provi evidence for many theoretical considerations and pract help in the diagnosis, prognosis, and treatment of ex pulmonary tuberculosis. Other points of interest ari out of the history and other investigations carried on these patients will now be considered.

Sanatorium Treatment.—As was pointed out, 26 patie had undergone sanatorium treatment. In 4 of th cases collapse therapy was instituted. The remain were treated on general lines and responded in compl healing of 12 of the remaining 19 patients. Those r completely healed are progressing favourably. Th facts suggest that the pulmonary lesions were either t primary complex in children or the hæmatogenous ty of lesion in adults, both likely to be associated wi skeletal tuberculosis and both responding well to gene lines of treatment. This conclusion was supported by t few radiograms of the chest obtained from some sanato and by the films of those cases still showing active lesio

TABLE V—INCIDENCE OF PLEURAL EFFUSIONS

Onset in relation to skeletal lesion	No. of cases of pleural effusion	Bilateral effusions	Positi radiogra
Before	43	4	24
During	10	4	4
After	4	0	2
Total ..	57	8	30

The favourable prognosis in this type of pulmona lesion is emphasised by the large number of patien (12) showing normal lung fields within a few years sanatorium treatment. It was, however, surprisi to find the skeletal lesion developing unfavourably these 12 cases, as usually the skeletal and the lu lesions follow the same course. Two factors may ha been responsible: (1) the delay in the diagnosis of t tuberculous nature of skeletal symptoms—these we usually diagnosed and treated as rheumatism, whi implied an added strain on bone or joint; (2) the develo ment of cold abscesses in relation to the skeletal lesio which soon became secondarily infected. In this co nexion it should be emphasised that any skeletal sym toms in a patient known to have tuberculosis must considered of the same ætiology until proved otherwi Repeated radiography and clinical evaluation are essenti if these cases are not to be wrongly diagnosed.

Pleurisy.—Table v summarises the incidence of pleu effusions in this series before, during, and after t development of the skeletal lesion, and the pulmona findings in these patients.

The number of patients who had pleurisy is thus (12% of the whole series); 8 of these effusions we bilateral. Of these bilateral cases, only 1 patient h died of miliary tuberculosis, and 2 others have shown semi-miliary type of lesion, which has, however, regresse slowly to complete absorption. The gloomy progno attributed to bilateral effusions cannot, therefore, b maintained.

It is worth while to emphasise the scarcity of pleur effusions in the younger age-groups. Only 2 patient had pleurisy in the 5–9 and 1 in the 10–14 age-grou The explanation of this fact is obscure. Pleurisy ca thus be said to be an early manifestation of tuberculou infection which may terminate in pulmonary or extr pulmonary lesions. This conclusion has obvious implica tions to those engaged in the prevention and detectio of all types of tuberculosis.

Signs and Symptoms.—The present history and the ysical signs are of little help in determining the presence a lung lesion. The lesions are minimal and no signs symptoms are to be expected.

Sputum and Gastric Lavage.—Only 6 patients had utum positive for tubercle bacilli, partly because of the ematogenous nature of the pulmonary lesion and rtly because no positive cases were admitted. The sult of gastric lavage and guineapig inoculation, wever, came as a surprise. The question arose hether positive gastric-lavage cases could be retained the same ward as non-tuberculous patients. This oblem was rather urgent in the children's ward, where n-tuberculous orthopædic cases were kept together with e tuberculous ones. To determine the point, 3 positive stric-lavage cases were left in the general ward among e non-tuberculous cases. No special precautions were ken. The non-tuberculous cases were Mantoux tested. he positive were excluded, and the negative were tested t three-monthly intervals until discharged. 18 Mantoux-egative cases were in the ward, and the average length f stay was six months. No cases became positive while the ward. It was therefore concluded that tuber-ulous pulmonary lesions producing tubercle bacilli in ch small numbers as to require a guineapig inoculation gastric contents to demonstrate their presence are not clinical source of infection and can be left safely in ntact with non-tuberculous cases. This policy has en followed since that time in this hospital, and no berculous case has developed as a result.

SUMMARY

The respiratory tract of 500 patients with skeletal berculosis was investigated. Of these, 284 (57%) d active pulmonary lesions.

The type of lesion varied according to age. The imary complex was found in most of the children, and ematogenous foci in adults.

The respiratory tract thus appears to be the route of try of the tubercle bacillus even in skeletal tuberculosis.

The infecting organism is therefore most likely to be, clinical grounds, the human type from human open lmonary cases. Milk infected with bovine tubercle cilli, in this part of England, can no longer be con-dered an important source of skeletal tuberculosis, esumably because of its pasteurisation.

The clinical findings were confirmed bacteriologically typing the tubercle bacilli obtained from pathological aterial derived from the skeletal lesion.

The skeletal lesion in most children originates soon ter the primary infection. In most adults it is due to activation of quiescent tuberculous foci resulting in ood-stream dissemination and subsequent implantation bone and lung.

The importance of routine radiography of the chest in e diagnosis and prognosis of skeletal tuberculosis is phasised.

My thanks are due to Mr. J. R. Rocyn-Jones, Mr. E. P. Brock-an, Mr. J. A. Cholmeley, and Mr. E. H. Hambly for rmission to investigate the patients under their care, and to . B. H. E. Cadness-Graves and Dr. H. Schwabacher for the cteriological investigations.

REFERENCES

mens, W., Flesch-Thebesius, M. (1923) *Beitr. klin. Tuberk.* 54, 299.
acklock, J. W. S., Griffin, M. A. (1935) *J. Path. Bact.* 40, 489.
eming, G. B. (1943) *Lancet*, ii, 680.
ecker, A. (1931) *Z. Tuberk.* 60, 222.
cKinnon, A. P. (1924) *Canad. med. Ass. J.* 14, 124.
rienfeld, O. (1939) *Papworth Res. Bull.* 2, 37.
ng, C. M., Chen, H. I. (1935) *J. Bone Jt Surg.* 17, 552.
ters, C. K. (1937) *Tubercle*, 19, 28.
golsky, H. (1929) *New Engl. J. Med.* 201, 11.
isner, D. (1934) *Amer. Rev. Tuberc.* 30, 376.
osencrantz, E., Piscitelli, A., Bost, F. C. (1941) *J. Bone Jt Surg.* 23, 628.
yder, C. H. (1933) *Ibid*, 15, 924.
epper, L., Jacobson, G. (1943) *Amer. Rev. Tuberc.* 47, 156.
accarezza, R. F., Gomez, F. D. (1940) *An. Cdted. Pat. Clin. Tuberc.* 2, 307.

ANURIA TREATED BY RENAL DECAPSULATION AND PERITONEAL DIALYSIS

RONALD REID
M.S. Lond., F.R.C.S.
SURGEON

JOHN B. PENFOLD
M.B. Durh.
PATHOLOGIST

ROLAND N. JONES
M.A., M.B. Camb.
RESIDENT SURGICAL OFFICER

ESSEX COUNTY HOSPITAL, COLCHESTER

A CASE of incompatible blood-transfusion, followed by uræmia, was unsuccessfully treated by all the commonly recognised methods, and finally yielded to decapsulation of the kidneys, the associated uræmia being relieved by the use of the peritoneum as a dialysing membrane.

Incompatible blood-transfusion is followed by reactions which fall into three phases. The immediate reaction develops shortly after the transfusion is begun and varies in intensity with the amount and rapidity of the injection and the sensitivity of the patient. In the more severe cases immediate death takes place, and in the less severe there is a rigor with a bursting headache, tingling in the limbs, pain in the back, great shortness of breath, precordial pain, and sometimes a sense of impending death. If the transfusion is immediately abandoned, the donor cells are lysed, there is hæmoglobinæmia, transient jaundice, and hæmoglobinuria, and the patient after the first shock makes a steady recovery. However, if much incompatible blood is given, the reaction may be much more severe, and it is usual for the patient to pass a moderate quantity of wine-coloured urine containing hæmoglobin (Hb) or acid hæmatin.

The second phase is a latent interval in which the patient improves clinically but passes a very small amount of urine. The third phase is that of renal failure and uræmia, and is followed either by the re-establishment of urine flow and recovery or by death in uræmic coma.

General opinion in the past has been that the anuria is caused by the mechanical blockage of the renal tubules by precipitated blood pigment, the donor's blood being lysed and the Hb excreted through the kidneys, where, in the presence of acid urine, it is deposited as insoluble acid hæmatin. In rabbits the urine is always alkaline and hæmoglobin is excreted unchanged and without renal damage. Baker (1937) stated that the Hb must either pass out through the glomerular filter or be excreted by the tubules; in either case it arrives in the lower convoluted tubules, where the urine is concentrated. In the presence of a sufficiency of salt and in an acid medium the Hb is deposited as acid hæmatin, which is seen microscopically as a brown granular precipitate. Baker concluded that, with a concentrated urine which precipitates Hb, there were three possibilities, depending on the amount of Hb excreted and on the degree of concentration of urine: (1) with a considerable Hb excretion and a very concentrated urine, there is a massive precipitation of hæmatin in the renal tubules, which packs down in masses, causing permanent blockage leading to complete anuria; (2) with a moderate amount of Hb or a more dilute urine, the precipitate is less copious and produces a temporary obstruction, which is followed by the gradual extrusion of hæmatin casts and diuresis; (3) with still less Hb or a very dilute urine, a little hæmatin is precipitated in the renal tubules and is easily passed out, often as granular casts, and no gross functional damage to the kidney results.

Trueta et al. (1946) have discovered that the renal blood-flow is profoundly influenced by nervous stimuli, the result of central or peripheral action by various noxious agents, and have shown in experimental animals that under certain conditions the renal circulation continues through the medulla while the cortex is ischæmic and the urine-flow completely suppressed. These workers, who were investigating the mechanism of crush syndrome, suggest that urine suppression due to sulphonamides, incompatible blood-transfusion, Weil's disease, and some forms of nephritis is due to a defence mechanism by which the cortex of the kidney is excluded from the circulating toxin by an intrarenal vascular shunt. While this recent work is of profound significance, the generally accepted view today is that renal suppression resulting from incompatible blood-transfusion is caused by the blockage of the renal tubules by massive deposits of hæmatin crystals.

Post-transfusional anuria leads either to death in uræmic coma or to diuresis and recovery. As salvation lies in diuresis and nothing else, treatment has consisted of the ingestion of huge quantities of fluid, of alkalinisation of the blood in the hope that the obstructing acid hæmatin may dissolve, of washing out the renal pelvis with hot lotions, and of spinal anæsthesia to exclude nervous stimuli and so relieve the renal vascular spasm. Finally, decapsulation of the kidneys has claimed a few triumphs. In the case here recorded the various therapeutic measures were tried in order with, so far as possible, clear-cut intervals to observe their separate effects.

In the third or uræmic phase of suppression the blood-urea level rises daily, and it seems reasonable to assume that, since the renal damage may be reversible, any measures which would tide the patient over uræmia and avoid the fatal coma while the blocked kidneys cleared might be life-saving. Unknown to us, the use of the peritoneum as a dialysing membrane was investigated in experimental animals by Putnam in 1923, and the method had actually been used clinically by Seligman et al. (1946) to relieve uræmia. These workers treated with success a case of sulphathiazole renal suppression by irrigating the peritoneal cavity with large quantities of a specially prepared solution. After fourteen days of virtually complete anuria renal function was fully restored, but not before large quantities of urea had been removed from the blood by peritoneal dialysis. A method similar to that described by Seligman et al. was used in the case here reported.

CASE-RECORD

A married woman, aged 37, was admitted to hospital on March 17, 1946, with anæmia due to menorrhagia, and a blood-transfusion was advised as she had not responded to ordinary remedies. The patient's blood and her husband's having been grouped and reported to be A2 and O4 respectively, a blood-transfusion was started by slow intravenous drip at 5.30 P.M. on the 21st.

After 30 c.cm. of blood had been given, the patient felt hot and very short of breath and complained of pain in the lower abdomen. Something like a rigor developed, and the patient vomited, but 5 minims of adrenaline was given and the transfusion completed, a total of 350 c.cm. of blood and 80 c.cm. of citrate solution being given. During the night there was further vomiting and some diarrhœa.

Next day premature menstruation had started, and 350 c.cm. of wine-coloured urine with a heavy deposit was withdrawn by catheter. In view of this danger signal rectal glucose saline was begun, and the patient was catheterised at 6 P.M., when 120 c.cm. of clear urine was withdrawn.

As the patient had vomited all fluid taken by mouth, 2% sodium bicarbonate in water was substituted for the glucose saline per rectum. In all, about 1200 c.cm. of fluid was absorbed from the rectum, and 1 drachm of sodium bicarbonate was given by mouth every hour during the day, but most of it was returned.

The patient meanwhile developed herpes of the lip, headache, and restlessness. Both specimens of urine were acid and contained large quantities of albumin and blood.

On the 23rd it was reported that the patient had had a fair night, and she was catheterised at 6 A.M., when 120 c.cm. of cloudy yellow urine was withdrawn. The rectal drip was continued, and the patient took 2500 c.cm. of fluid by mouth and an hourly dose of 1 drachm of sodium bicarbonate, but half the fluid was vomited. An intravenous drip of 5% in water was started in the morning and continued duri next few days. Further catheterisation in the late afterno yielded 60 c.cm. of clear urine.

On the 24th the general condition remained unchanged but, as thrombophlebitis had started in the arm, the cannu was changed to the left leg. The intake of fluid by mout was 2500 c.cm. containing 17 drachms of sodium bicarbona but the patient vomited about 600 c.cm. In twenty-four hou 2500 c.cm. of glucose in sterile water was given intravenousl and the patient passed 60 c.cm. of clear urine.

Œdema of the face, ankles, and hands now appeared, b the lungs were clear and the bowels freely open. The bloo urea level was 120 mg. per 100 c.cm., and the urine acid a containing albumin. The blood-grouping was reinvestigat and it was found that the patient's group was O4 and th husband's A2.

On the 25th the patient had some epistaxis and menstru loss. About 2000 c.cm. of fluid was retained by mouth, and similar quantity of intravenous glucose saline was given i twenty-four hours. The patient perspired a little and had slight rigor, and catheterisation produced 70 c.cm. of clea urine.

On the 26th the patient's general condition remained th same, but she was rather more drowsy, and the administration of glucose in water was continued, 3000 c.cm. being give intravenously and about 1300 c.cm. by mouth.

At this juncture one of us (R. R.) saw the patient an recognising the possibility of arterial spasm as a factor in th suppression, gave a light 'Percaine' spinal anæsthetic up t the level of the 6th dorsal vertebra. The cerebrospinal flu was clear and not under increased pressure. This manœuv had no beneficial effect, as only 30 c.cm. of urine was recovere during the next twelve hours. The blood-urea level had rise to 153 mg. per 100 c.cm.

On the morning of the 27th there was little alteration in th patient's general condition, but the œdema had increased and there was definite renal tenderness on both sides. On th day 100 c.cm. of sodium sulphate 4% was given intravenously together with gr. 7·5 of caffeine sodium benzoate. Th treatment was repeated later in the day, but without avail The total fluid intake by oral and parenteral routes was abou 3000 c.cm. By next day there had been no response to diuretics, and the fluid intake was continued by mouth. In all about 40 c.cm. of urine was withdrawn by catheter. The blood pressure was 170/100 mm. Hg.

On the 28th the patient was transferred to the Essex County Hospital, Colchester, and on admission she was somewha vague and drowsy but answered questions moderately wel and seemed comfortable.

She was pale and had slight cyanosis of the lips, especially on effort. Her face and eyes were puffy, and there were pin patches on her cheeks. There was well-marked œdema o the hands and one arm. The cranial nerves were normal; th optic disks were not seen. There was good chest movement and nothing abnormal was detected in the cardiovascula system. There was considerable œdema on the back of th trunk, and both lung bases were dull, with diminished ai entry as far up as the angle of the scapula. The abdomen wa slightly distended and the skin œdematous, and there was dullness in the flanks but no more definite signs of ascites. Ther was well-marked renal tenderness on both sides behind an in front.

On the 29th patient's and donor's blood were examined, an a cross match showed agglutination; the patient's blood wa Rh-negative, and no anti-Rh bodies were found in her serum. The blood-urea level was 253 mg. per 100 c.cm., plasma-chlorides level 0·47 g. per 100 c.cm., plasma-protein level 0·5 g per 100 c.cm. A blood-count showed no abnormality; Hb 82%

Cystoscopy showed a normal bladder and orifices, and catheters were passed up to both renal pelves. Hourly washing with saline solution was started but soon caused pain and did not relieve suppression.

By 9 P.M. the patient's general condition was deteriorating; she was more pale and drowsy, with considerable œdema of the face and subcutaneous tissues in general. Renal tenderness was very marked; and, as no benefit had accrued from all the treatment so far tried, it was decided that the only hope lay in decapsulation of the kidneys.

Operation.—Under gas-oxygen-ether anæsthesia (Dr. Douglas Clendon) the patient was turned on her left side and the right kidney rapidly exposed by an th rib bed. Œdema of the skin, muscle, and perinephric sues was very pronounced. Decapsulation was performed. e patient was then turned over and a similar operation ne on the opposite side. Both kidneys presented the same pearance: about twice the normal size, dark blue, and as m as a tennis ball but less elastic. The capsules seemed ry tense, and pale-blue friable kidney bulged through the es of incision owing to increased intracapsular pressure. e left kidney almost exploded and piece of friable tissue re taken for microscopy. Both wounds were sewn up th through-and-through interrupted steel wire sutures, and e perinephric space was drained.

At the end of the operation the patient's neral condition s satisfactory, and a small incision was made into the ntoneal cavity at the extreme anterior end f the left renal ision, and into this a self-retaining Foley catheter was erted. To this was attached a dripper arrangement whereby ice normal saline solution with penicillin was run into the ntoneal cavity at the rate of 60 drops a minute

On the 30th the patient's general condition was poor, and e was more drowsy. During the night 2500 c.cm. of twice-rmal saline had been run into the peritoneal cavity, and e patient complained of distension and colic pain.

There was obvious ascites, and at 10 A.M. the catheter was sconnected from the dripper flask so that the ascitic fluid uld run out into a receptacle. This fluid which escaped th much relief to the patient, was lemon yellow, turbid, ghtly alkaline, and slightly glutinous, and amounted to 60 c.cm. It contained a fifth of its volume of albumin; a posit of pus with occasional red cells; urea 0·255 g. per c.cm.; and chlorides 0·526 g. per 100 c.cm.

By next morning the patient was passing water freely, and general œdema was melting away, the facial changes ing most marked, and moist sounds had disappeared from chest. During this day 350 c.cm. of urine was collected, d much passed into the bed from the bladder and the eration wounds. The blood-urea level was 200 mg. per) c.cm.

In the first twenty-four hours following decapsulation 00 c.cm. of twice-normal saline was introduced into the ntoneal cavity, and 1860 c.cm. of fluid was withdrawn. The urea content of the efflux was 255 mg. per 100 c.cm., indicating that 4·7 g. of urea had been eliminated by dialysis through the peritoneum.

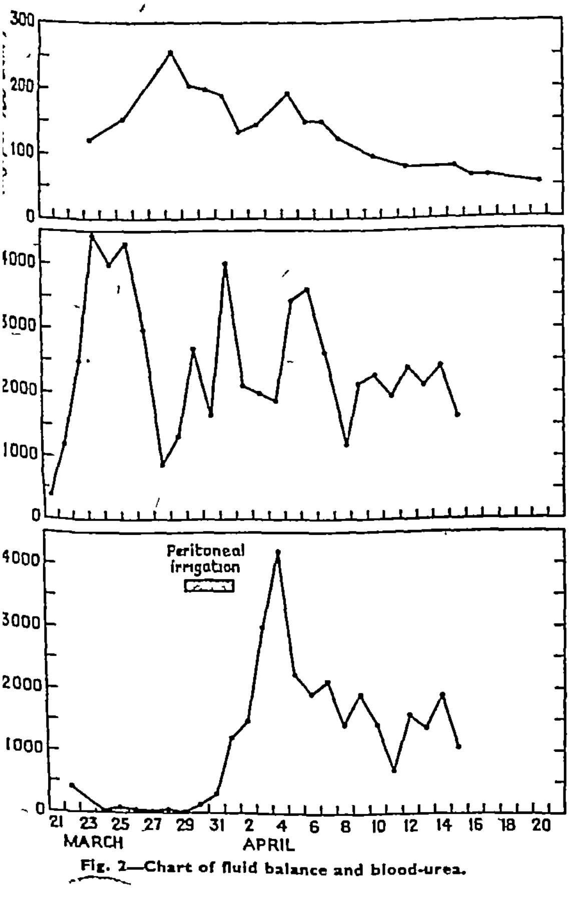


Fig. 2—Chart of fluid balance and blood-urea.

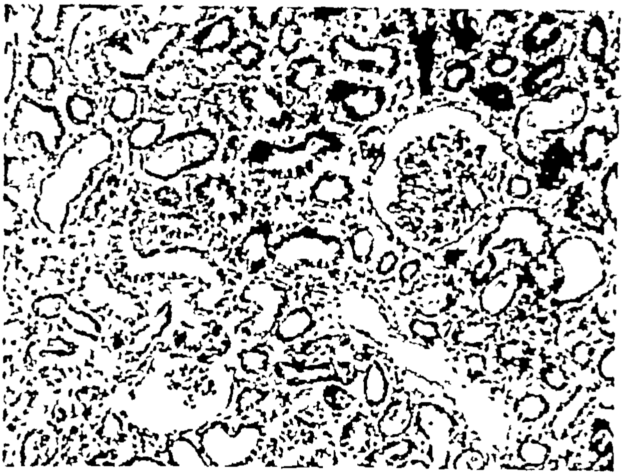


Fig. 1—Section of renal cortex, showing œdema, with occasional small foci of polymorphs and round cells in the interstitial tissue; degeneration of the tubular epithelial cells; and blockage of some tubules with a brown granular pigment. Hæmatoxylin and eosin. (×95.)

In the next twenty-four hours 3000 c.cm. of twice-normal saline was run into the peritoneal cavity, and 660 c.cm. of fluid was recovered, but there was a considerable unmeasured leakage round the tube. The urea content of the efflux was 262 mg. per 100 c.cm., indicating that 1·73 g. of urea had been eliminated through the peritoneum.

Thus in the first forty-eight hours of peritoneal irrigation 6·4 g. of urea was recovered in the collected efflux, and it is certain that more urea was eliminated, because much fluid was lost by leakage round the peritoneal catheter.

Next day the patient's general condition was very much improved, and the blood-urea level was 200 mg. per 100 c.cm. A further 1800 c.cm. of twice-normal saline was introduced into the peritoneal cavity, and only 30 c.cm. of fluid was recovered, but there was probably considerable leakage.

By this time the tube had become blocked or sealed off, so it was removed. From the small incision clear serous fluid leaked for five or six days. The blood-urea level on this third postoperative day was 180 mg. per 100 c.cm. and on the fourth postoperative day 130 mg. per 100 c.cm.

Clinically the patient had improved beyond all expectation. She was bright, her skin was in much better condition, and the œdema had disappeared. She was no longer drowsy, was coöperative, and took food and drink by mouth.

Blood-urea estimations were carried out daily, and the blood-urea level rose sharply after drainage of the peritoneum had ceased to be effective, and it continued to rise for three days before it began to fall coincidentally with the increase in urine output and in urinary urea.

By April 23 the patient's blood-urea was 30 mg. per 100 c.cm. and the urine urea and chloride estimations were normal, and a week later the patient was discharged, having made a full recovery.

DISCUSSION

This case is another example of the well-known picture of anuria due to mismatched transfusion. Uræmia is not a sufficiently broad term to define the consequences of urinary suppression because not only is urea accumulated in the body but also other nitrogenous substances, water, salts, and perhaps many more substances are retained, to which are also added those materials introduced therapeutically. The rise in blood-urea level is a gross and obvious change, and to this too much attention may easily be accorded. Though not so readily detected, changes in the delicate balance of blood chemistry and water metabolism must not be overlooked, especially when they come under the influence of peritoneal dialysis, lest measures to reduce the amount of blood-urea may so disturb general metabolic processes that life is endangered rather than protected by the enthusiastic therapist.

In the treatment of anuria, whether due to mismatched transfusion, sulphonamide blockage, "crush syndrome," or other cause, first place has been given to the administration of huge quantities of fluid, often containing sodium chloride and alkalis, and by this procedure much water and salts are added to the body fluids already embarrassed by the kidney failure. The disturbance of osmotic pressure causes œdema, and the retention of phosphates and other substances may cause acidosis and a fall in serum-calcium level. At first the body can withstand the abnormal conditions, but later certain changes in the blood chemistry show that stability can no longer be maintained. In our case the patient had severe general œdema, which was probably not without its effect on the pulmonary, cardiovascular, and central nervous systems. This œdema was nowhere more severe than in the kidneys exposed at operation; and, whatever the essential cause of anuria, we believe that renal œdema, which is so clearly shown in the microscopical section (see fig. 1), further embarrassed the blood circulation. The section of the kidney shows the typical picture of tubular damage and deposits of pigment, and œdema is also very obvious. We feel that this last factor has been given too little consideration in the past, and that efforts to produce diuresis by forcing the fluid intake may be a two-edged weapon.

With regard to the local treatment of the kidneys, beyond general efforts to promote diuresis, we think that in our case none of the procedures adopted before decapsulation had any beneficial effect, and that the operation was justified by the subsequent diuresis. The expansion of the kidneys following section of the capsule was most impressive, and suggests that the relief of tension was an important factor in renal recovery.

We believe that the use of the peritoneum as an excretory organ played an important part in the recovery, the beneficial results being shown by the steady fall in blood-urea level while the peritoneal irrigation was efficient, and by the large quantity of urea—i.e., 7 g.—recovered from the peritoneal efflux. Unfortunately much of this efflux was lost, and the true efficiency of the method could therefore not be measured. The fact that after the failure of peritoneal irrigation the blood-urea level rose and then fell again with increasing diuresis is further evidence that the peritoneum allows easily diffusible substances, such as urea, to pass from the circulating blood into an artificially created ascites. Taking as a conservative estimate the amount of urea eliminated by this method in forty-eight hours as 6·4 g., and knowing the blood-urea level to be at that time 200 mg. per 100 c.cm., we can assume that, the blood-volume being 5 litres, roughly 3·2 litres of the blood were cleared of urea in two days. During this period the patient's blood-urea level fell from 200 mg. to 136 mg. per 100 c.cm., a drop of 64 mg. per 100 c.cm. On the assumption that the patient's blood-volume was 5 litres, this change represents a fall in the total blood-urea of 3·2 g., and the discrepancy between this figure and the 6·4 g. eliminated by peritoneal dialysis and urea in the urine is explained by the mobilisation of urea from the tissues into the blood.

The accompanying table and fig. 2 show the changes in fluid intake and output and in blood-urea level during most of the patient's stay in hospital, and it can be reasonably inferred that the use of the peritoneum as a dialysing membrane had an important influence in reducing the blood-urea level before the establishment of diuresis. One of the most interesting points shown by the pathological findings is the rise in blood-urea level after the peritoneal irrigation became inefficient owing to blockage of the tube. Possibly the introduction of 7 litres of twice-normal saline into the peritoneal cavity reduced the volume of the intravascular fluid by osmotic pressure, and that affected the kidney by relieving œdema. The state of the kidneys at operati and the diuresis after relief of intracapsular tension mal it possible that any reduction of general œdema by t twice-normal saline introduced into the peritoneu *would have an especially beneficial effect on the kidney* That the amount of intravascular fluid was decreased i not considered likely, because of the 4000 c.cm. of flui put into the peritoneal cavity in the first twenty-fo hours only 1860 c.cm. was recovered. As there was n much leakage at this time, much of the twice-norm saline must have been absorbed, and this is support by the rise in the level of plasma and urinary chlorid (see table).

FINDINGS IN BLOOD AND URINE

Date	Plasma chlorides (g./100 c.cm.)	Urine chlorides (g./100 c.cm.)	Plasma protein (g./100 c cm
March 29 ..	0 47	..	6 5
" 30 ..	0·47	0·59	..
" 31 ..	0·59	0·88 0 94 0·46	6 45
April 1 ..	0 67	0·46 0·24 0·46	6·1
" 4 ..	..	0·35	..
" 6 ..	0·59	0 38	..

Period of peritoneal irrigation lasted from March 30 to April inclusive.

In our case peritoneal dialysis was effected b *inducing an artificial ascites*; but, except for the fi twenty-four hours, very little of the introduced flu was recovered from the peritoneal cavity. The fluid w slightly turbid and alkaline, and contained a fifth of i volume of albumin, with pus and occasional red cell which shows that twice-normal saline irritates t peritoneum. From the blood-stream 6·4 g. of urea w cleared, and there is no doubt that changes in chlorid and other substances took place, the exact extent which we could not determine. We considered t possibility of introducing two tubes into the peritone cavity so that a continuous stream might flow throug but thought such a procedure might gravely upset t general metabolism, and we were unwilling to take an risks in a patient who was apparently on the way t recovery.

We publish this paper not only as a chronicle of t treatment of a case of post-transfusional suppression urine but also as the record of a clinical experiment which owing to the pressure of events, could not be carried ou with anything like proper scientific precision, but whic nevertheless has lessons for the future. First, we believ that the massive intake of fluid recommended in th treatment of renal suppression is not without danger and that generalised and more especially localised rena œdema may embarrass rather than encourage the retur of renal function. Secondly, we have found that th commonly recommended local treatments to the kidney were useless, except decapsulation, which in our ca proved to be the deciding factor in recovery. Thirdly we have found that peritoneal irrigation is effective i reducing the blood-urea level when it is raised abnormally high, but how long the irrigation can be maintained w do not know. Our conclusions support those of Seligman et al. (1946), to whom, so far as we know, goes the credit of introducing this method of treating uræmia. The method appears to be particularly suited to cases o reversible renal damage where there is a reasonable hope that the kidneys may recover sufficiently to support life.

Our irrigating tube became blocked soon after treatment was initiated, and this may be due to our use of twice-normal saline, which seems to have set up a considerable peritoneal reaction, and it is probable that adhesive peritonitis finally put an end to the treatment. In the future it may be that fluids will be devised which will enable irrigation to be continued longer.

Finally, though this method appears to be satisfactory in reducing the blood-urea level, its effect on the delicately balanced metabolism must not be forgotten, because the irrigating fluid is in such close contact with the vascular bed that changes may take place through the peritoneal membrane so rapidly as to endanger the patient's life. Until further evidence, clinical and experimental, is forthcoming about the changes which take place through the peritoneum, the method should be used with the greatest care and only when other and more simple procedures are likely to prove ineffective.

SUMMARY

Incompatible blood-transfusion may be followed by uria and uræmia.

Post-transfusional anuria leads either to death in æmic coma or to diuresis and recovery. Treatment erefore aims at diuresis.

In the present case various forms of such treatment ere given, including alkalis, plenty of fluids, both by outh and intravenously, spinal anæsthesia, diuretics, d renal decapsulation.

Finally, twice-normal saline solution was given intraeritoneally by drip injection, and later the fluid was ained off. By this method much urea was eliminated y dialysis through the peritoneum, with relief of æmic symptoms. The patient fully recovered.

We wish to thank Prof. John Beattie, of the Royal College f Surgeons, for encouragement and valuable criticism.

REFERENCES

aker, S. L. (1937) *Lancet*, i, 1930.
utnam, T. J. (1923) *Amer. J. Physiol.* 3, 548.
eligman, A. M., Frank, H. A., Fine, J. (1946) *J. clin. Invest.* 25, 211; *J. Amer. med. Ass.* 130, 703.
ueta, J., Barclay, A. E., Daniel, P., Franklin, K. J., Prichard, M. M. L. (1946) *Lancet*, ii, 237.

ACUTE INFECTIOUS MONONUCLEOSIS
COMPLICATED BY ENCEPHALOMYELITIS
REPORT OF A CASE

SIMCHA GELIEBTER
M.D. Milan, L.R.C.P.E
ASSISTANT MEDICAL OFFICER, L.C.C. HIGHGATE HOSPITAL

ONLY about a dozen cases of acute glandular fever infectious mononucleosis) exhibiting central nervous omplications have been described. Johansen (1931) eported "serous meningitis," and Epstein and Dameshek 1931) "involvement of the C.N.S." in glandular fever. Johansen's case presented meningeal signs, but the erebrospinal fluid (C.S.F.) showed very little change. Epstein and Dameshek's was a typical case of glandular ever, except that the cerebral symptoms overshadowed the general disease; and even here the C.S.F. showed only an increase in cells (lymphocytes) and little increase in the protein content. Tidy (1934) mentioned the possibility of meningeal complications. Viets and Watts (1929) reported aseptic meningitis, and Schmidt and Nyfeldt (1938) meningo-encephalitis as complicating glandular fever. During an epidemic of mononucleosis Halcrow et al. (1943) investigated 296 cases, among which only 5 patients had meningeal symptoms severe enough to require lumbar puncture. In 4 cases the C.S.F. pressure was increased; 3 out of 4 had a cell-count of more than 5 cells per c.mm., and 1 had a normal cell-count. Landes et al. (1941) described central nervous manifestations, their case being especially interesting because of the cell-protein dissociation. Fledelius (1935) reported paresis of the inferior rectus muscle of the left eye.

An unusual case of infective mononucleosis with varied nervous complications was seen recently in this hospital.

CASE-RECORD

A girl, aged 10 years, was admitted with a history of having had, three weeks before admission, a sudden swelling of her cervical lymph-glands, accompanied by general malaise. She was not seen by a doctor but was put to bed for a week, after which she complained of general weakness. Her mother noticed at this time a slight swelling of her eyes and face. The patient was seen at the outpatient department of a hospital, where "acute tonsillitis" was diagnosed and the mother was advised to put the child back to bed. Two or three days later the patient had several attacks of vomiting without apparent cause; after three more days she tried to get up again but felt too tired, her general condition and appetite being poor. On the day before admission she again had repeated attacks of vomiting, and pain developed in legs, thighs, and shoulders. She was seen by a doctor, who sent her here with a tentative diagnosis of acute rheumatic fever.

On admission her general appearance was poor; facies thin and sallow; tongue furred but moist; fauces clean; tonsils neither enlarged nor inflamed; slightly enlarged lymph-glands in both posterior triangles of the neck, especially on the left side. No displacement of trachea. Nothing abnormal detected in the cardiovascular system, lungs, or abdomen. No meningeal signs, no muscular weakness. Temperature normal, pulse-rate 96, respirations 20 per min. The movements of all limbs were good, but there was slight pain in joints and muscles on brisk movement. A provisional diagnosis of subacute articular rheumatism was made.

Investigations.—Throat swab: Klebs-Löffler bacillus not isolated; gram-staining of film and culture showed mainly *Strep. viridans* and no hæmolytic streptococci.

Erythrocyte-sedimentation rate (E.S.R.): 4% in 1 hour.

Blood-count: red cells 5,310,000 per c.mm., Hb 96%, colour-index 0·91; white cells 5500 per c.mm. (neutrophil polymorphs 13·5%, lymphocytes 82·5%, large mononuclears 4%).

Radiography of chest: no pulmonary lesion evident.

Urine: nothing abnormal detected.

In the 5 days after admission there was little change in her general condition. Muscles and joints were still aching, but the temperature was not raised. On the 6th day there was an evening pyrexia of 99° F.

On the 7th day the patient was lethargic, refused food, complained of pain in both hips and shoulders, would not sit up, lay on her right side, and was very reluctant to move about, but had no vomiting, photophobia, or squint. Examination revealed neck rigidity and a bilateral positive Kernig's sign. Lumbar puncture gave a clear C.S.F., under increased pressure, containing 9 lymphocytes and 6 red cells per c.mm.; total protein 400 mg. per 100 c.cm.; a large excess of globulin; chlorides 740 mg. per 100 c.cm.; no tubercle bacilli or other bacteria; culture was sterile. It was then thought that the case was possibly one of tuberculous meningitis.

On the 8th and 9th days there was no change in the general picture. Evening pyrexia of 99° F. During the night of the 9th day there was a transient diplopia lasting half an hour. On the 10th day there was diplopia for an hour.

On the 11th day neck rigidity was still well marked; Kernig's sign positive; and muscular power of right arm weaker than left. The biceps, triceps, and supinator reflexes were present and equal on both sides; upper abdominal reflexes present, lower weak; ankle jerks and plantar responses doubtful. No squint, headache, or incontinence. Hyperæsthesia and hyperalgesia of muscles of thighs and calves. Optic disks showed no papillœdema, exudate, or hæmorrhage. Temperature 99° F in the evening. Lumbar puncture gave clear C.S.F. under a pressure of 110 mm. H_2O, containing 5 lymphocytes and 67 red cells per c.mm.; total protein 400 mg. and chlorides 790 mg. per 100 c.cm.; culture sterile.

The 12th day followed a quieter night; not so much pain now, but all the above-mentioned signs were more pronounced than before, and in addition there was a general weakness of the muscles of the trunk; patient could not sit up even if supported. The shoulders were apparently weaker than the other parts. The right knee jerk and both ankle jerks were absent. Acute poliomyelitis was now considered as the diagnosis.

This condition continued until the 17th day, when patient felt better and could move her trunk and legs very slightly, but Kernig's sign was still positive. A white-cell count gave 3400 leucocytes per c.mm. (neutrophil polymorphs 25%, eosinophil polymorphs 1%, basophil polymorphs 1%, lymphocytes 68%, large mononuclears 5%). Paul-Bunnell test positive (1–256).

General movements improved still more on the 18th and 19th days. Lumbar puncture showed again a clear C.S.F., under a pressure of 100 mm. H_2O, containing 5 lymphocytes per c.mm.; total protein 250 mg. per 100 c.cm.; a moderate excess of globulin; chlorides 740 mg. per 100 c.cm.; culture negative. Wassermann and Lange reactions negative.

On the 25th day patient could sit up unaided up to 45°–60°, moving both arms well and without pain, but could not extend legs on flexed thighs. Hyperalgesia still present; right knee jerk and both ankle jerks absent.

Improvement continued on the next two days, and a white-cell count gave 4000 leucocytes per c.mm. (neutrophil polymorphs 27%, eosinophil polymorphs 6%, basophil polymorphs 1%, lymphocytes 61%, mononuclears 5%). E.S.R.: 7% in 1 hour.

On the 34th day all signs were rapidly disappearing, but knee and ankle jerks not yet present. Paul-Bunnell test positive only up to 1–32. The patient was attempting to stand but still had some pain on doing so. Lumbar puncture on the 35th day gave a clear fluid, under pressure of 85 mm. H_2O, containing 2 leucocytes per c.mm.; total protein 100 mg. per 100 c.cm.; a slight excess of globulin; chlorides 725 mg. per 100 c.cm.; culture sterile.

On the 40th day right knee jerk and both ankle jerks now very weak; patient able to walk slowly with legs divaricated. On the 44th day jerks normal and equal, patient walking much better. On the 49th day gait almost normal. A white-cell count gave 5000 leucocytes per c.mm. (neutrophil polymorphs 23%, eosinophil polymorphs 1%, lymphocytes 69%, large mononuclears 7%).

On the 51st day gait was normal and the patient was free from all symptoms.

DISCUSSION

This case appears to be one of glandular fever in which the central nervous system was severely affected, followed by complete recovery. The Paul-Bunnell test was strongly positive (1–256) at the height of the nervous affection and became barely positive when the neurological signs had practically gone. Of particular interest is the fact that during the whole course of the disease there was a persistent leucopenia. At no time were the white cells more than 5500; the lowest figure was 3400. The mononuclears were never more than 7%, the maximal lymphocytosis was 82·5%. Tidy (1934) writes: "It is evident that the virus of glandular fever transiently affects all the blood-forming tissues—and no single blood picture is typical of the disease."

The C.S.F. never contained more than 9 lymphocytes per c.mm., even when the protein was 400 mg. per 100 c.cm. One might perhaps deduce that the small increase of white cells in the C.S.F. (and the consequent cell-protein dissociation) was ætiologically related to the leucopenia. This relationship, however, has still to be proved, just as much as the reputed relationship between the increase of leucocytes in the blood and in the C.S.F. On the other hand, the protean manifestations of the neurological lesion point to the fact that the brain and the spinal cord were involved. This should therefore be considered as a case of encephalomyelitis complicating an acute mononucleosis of a rather unusual type.

Had the sheep-cell agglutination test not been performed, the cause of the illness might have been missed. It is certainly worth while having a Paul-Bunnell test done in all cases showing acute neurological manifestations without apparent cause.

SUMMARY

An unusual case of glandular fever exhibiting widespread involvement of the central nervous system is described. The signs and symptoms were of the type seen in encephalomyelitis. Complete recovery followed.

I wish to thank the Medical Officer of Health, L.C.C., and Dr. J. O. Reid, medical superintendent of Highgate Hospital, for permission to publish this case.

REFERENCES

Epstein, S. H., Dameshek, W. (1931) *New Engl. J. Med.* 205, 12[illegible]
Fledelius, M. (1935) *Acta ophthal., Kbh.* 13, 150.
Halcrow, J. P. A., Owen, L. M., Rodger, N. O. (1943) *Brit. med. J.* ii, 443.
Johansen, A. H. (1931) *Acta med. scand.* 76, 269.
Landes, R., Reich, J. P., Perlow, S. (1941) *J. Amer. med. As[illegible]* 116, 2482.
Schmidt, V., Nyfeldt, A. (1938) *Acta oto-laryng., Stockh.* 26, 680.
Tidy, H. L. (1934) *Lancet*, ii, 180, 236.
Viets, H. R., Watts, J. W. (1929) *J. Amer. med. Ass.* 93, 1553.

REPEATED ABORTIONS, MISCARRIAGES, AND STILLBIRTHS

VALUE OF ANTISYPHILITIC TREATMENT

RAYMOND G. CROSS
M.D. N.U.I., M.R.C.P.I., M.A.O., M.R.C.O.G.
LATE ASSISTANT MASTER, ROTUNDA HOSPITAL, DUBLIN

THE incidence of repeated abortions, miscarriages, or stillbirths is low.[1] The 54 cases reviewed here are the total number encountered in three years in the antenatal department of the Rotunda Hospital, during which time the hospital was responsible for 15,780 deliveries,[2] making the incidence in this series less than 0·4%.

In 1924–27, during the assistant mastership of Dr. N. McI. Falkiner, the present master of the Rotunda Hospital, it was the practice of the hospital to treat syphilitic mothers at a special clinic in the antenatal department. Excellent results were achieved in patients with a positive Wassermann reaction and a history of repeated stillbirths. The report on the blood reaction of some of the patients suspected of having syphilis was doubtful, the result reading "doubtful positive, please repeat" or "doubtful negative, please repeat." These patients were given full antisyphilitic treatment, as if their blood reaction had been positive, and most of them gave birth to live babies.

It then occurred to Dr. Falkiner that a patient with a history of repeated abortions and a negative Wassermann reaction might respond equally well to full antisyphilitic treatment, and from that date this treatment has been applied to all cases with a history of repeated abortions, whether the Wassermann reaction is positive or not. The present 54 cases were seen and treated by me during my period as assistant master (May, 1941–44).

Antisyphilitic treatment with organic arsenicals is not without attendant risks, and in 1941–44 some cases of severe jaundice after treatment with these drugs were reported in private communications. It was therefore decided to change to 'Bisoxyl,' which carries far less risks and does not seem to be any less effective in preventing stillbirths.

MANAGEMENT

The routine management of cases of repeated abortion, miscarriage, or stillbirth is as follows:

Investigation.—After the careful recording of the patient's general and marital history, including a statement of the frequency of intercourse and the time of the menstrual cycle at which intercourse mostly takes place, a complete general medical examination is made, with special emphasis on syphilis, diabetes, and hypothyroidism. This is followed by gentle bimanual examination to exclude malposition and malformation of the uterus and by inspection of the cervix with a bivalve speculum to exclude laceration, &c. Finally, specimens of blood and of breast fluid are taken for estimation of the Rh factor.

---

[1] Abortion is used to mean expulsion of the ovum before the time of the formation of the placenta (i.e., during the first 3 months); miscarriage when expulsion takes place after the formation of the placenta but before the 28th week; stillbirth for expulsion of a dead fœtus after the 28th week.

[2] Falkiner, N. M. Clinical Reports of R[illegible]

Treatment.—The patient is given general advice on enatal care. One vitamin E tablet twice daily, one cium tablet thrice daily with milk, and iodised table t instead of ordinary table salt are prescribed. The ient is instructed to avoid excessive exercise, especially what would otherwise be her menstrual periods, and rest every afternoon in bed for two hours.

As routine antenatal care, at each weekly visit her ight is charted, her blood-pressure is estimated, her ne is tested for albumin and sugar, and she is given tisyphilitic treatment, consisting of ntramuscular oxyl 2 c.cm. weekly for eight weeks, followed by six eks' rest, continuously throughout pregnancy.

Contra-indications are recurrent toxæmia and fœtal ath due to blood-group difference (Rh factor).

COMMENT

The table shows that 54 patients had previously had 9 pregnancies but had produced therefrom only 55 e babies, which constituted a salvage-rate of only 22%. After antisyphilitic treatment these 54 patients proced from 54 pregnancies 49 live babies—a salvagete of about 90·7%.

Age (yr.)	Previous pregnancies				Week of pregnancy when first seen	Treatment	Result
	Abortions	Miscarriages	Stillbirths	Live births			
42	1	2	1	1	28	As	F.T.A.
[illegible]	..	..	2	1	30		F.T.A.
42	2	..	2	4	26	,,	F.T.A.
[illegible]	1	..	1	..	32	,,	F.T.A.
[illegible]	2	..	..	1	28	,,	F.T.A.
[illegible]	1	5	1	3	28		F.T.A.
[illegible]	..	2	..	..	24		F.T.A.
[illegible]	1	..	1	..	28	,,	F.T.A.
[illegible]	6	..	1	1	6	,,	Abor. at 10 wk.
25	..	..	2	1	28	,,	F.T.A.
[illegible]	..	..	3	4	6	,,	F.T.A.
[illegible]	..	..	2	..	16	,,	Mac. at 38 wk.
29	..	2	..	..	16	,,	F.T.A.
34	1	1	4	2	20	,,	F.T.A.
[illegible]	..	..	2	..	26	,,	F.T.A.
[illegible]	..	..	3	2	32	,,	Prem. alive, at 36 wk.
[illegible]	..	..	1	3	32	,,	F.T.A.
[illegible]	1	1	1	1	28	,,	F.T.A.
[illegible]	..	2	3	1	24	,,	F.T.A.
45	3	1	2	4	28	,,	F.T. anenceph.
[illegible]	4	..	..	1	18	,,	F.T.A.
[illegible]	4	1	1	..	19	,,	F.T.A.
[illegible]	..	..	2	..	34	,,	F.T.A.
[illegible]	2	..	..	1	32	,,	F.T.A.
[illegible]	2	..	4	2	20	,,	F.T.A.
41	1	..	2	..	28	,,	F.T.A. cæs.
[illegible]	..	1	3	..	16	,,	F.T.A. cæs.
[illegible]	3	..	..	..	13	,,	F.T.A.
25	8	..	..	..	12	,,	F.T.A.
[illegible]	2	..	4	..	10	,,	F.T.A.
[illegible]	..	..	2	..	31	,,	F.T.A.
[illegible]	3	..	..	..	8	,,	F.T.A.
[illegible]	1	..	1	..	9	,,	F.T.A.
[illegible]	1	..	4	2	34	,,	F.T.A.
42	4	..	4	6	32	,,	F.T.A.
40	3	..	3	1	32	,,	F.T.A. cæs.
35	2	..	..	..	12	As and Bi	F.T.A.
32	..	..	1	1	6	,,	F.T.A.
34	2	..	..	1	6	,,	F.T.A.
38	4	1	..	..	8	,,	F.T.A.
31	1	..	1	..	28	,,	F.T.A.
[illegible]	2	..	..	..	6	,,	F.T.A.
25	2	1*	..	..	12	Bi	F.T.A.
35	1	..	..	1	8	As and Bi	F.T.A.
36	1	..	4	1	8	,,	F.T.A. cæs.
21	3	..	..	1	14	,,	F.T.A.
34	1	..	1	1	20	,,	F.T.A.
[illegible]	4	..	..	..	9	Bi	F.T.A.
[illegible]	..	1	..	1	36	,,	Baby alive
[illegible]	..	3	..	..	14	,,	Normal at 34 wk.
29	1	..	..	2	16	,,	F.T.A.
33	1	1	1	1	8	As	Abor.
36	2	..	..	2	..	,,	F.T.A.
32	..	..	2	1	..	As and Bi	F.T.A.

Kahn reaction was negative in all cases. The Wassermann reaction was weakly positive in case 2, a trace positive in case 49, doubtful in case 5, and negative in the rest.

=arsenicals. Bi=bisoxyl. F.T.A.=full term, alive. Abor.=abortion. Mac.=macerated fœtus. Cæs.=cæsarean section (lower segment). * Ectopic pregnancy.

There were 4 cæsarean sections. This high rate is explained by the fact that these patients were treated primarily with the object of producing a live baby.

It is not suggested that the patients with a negative Wassermann or Kahn reaction were syphilitic; but the father may possibly have had syphilis partially treated, untreated, or fully treated.

SUMMARY

A history of habitual abortion, miscarriage, or stillbirth is often found in patients with no serological evidence of syphilis.

Good results can be achieved by treating these patients exactly as if they had syphilis.

Medical Societies

FAMILY PLANNING ASSOCIATION

ON Sept. 21 and 22 this association held in London a conference, under the chairmanship of Mr. A. S. PARKES, SC.D., F.R.S., on Infertility.

Rôle of Hyaluronidase in Fertilisation

Dr. G. I. M. SWYER recalled that the ovum of mammals, when freshly ovulated, was still surrounded by the cumulus, whose disintegration was an essential preliminary to fertilisation. McClean and Rowlands had demonstrated in 1942 that the enzyme hyaluronidase, whatever its source, was capable of denuding freshly ovulated rat ova. Rowlands in 1944 had suggested that the hyaluronidase in semen was derived from the spermatozoa, and that the sperms in an inseminate produced sufficient hyaluronidase to break up the cumulus rapidly and so permit penetration and fertilisation by one of their number. By adding hyaluronidase to diluted suspensions of rabbit spermatozoa, Rowlands had produced fertilisation with about a sixth of the minimum sperm concentration required in controls not receiving the added hyaluronidase; this suggested that the infertility of oligospermic semen might be due to an insufficiency of hyaluronidase. Dr. Swyer had developed an accurate viscosimetric method for the quantitative assay of hyaluronidase; and he showed figures proving a close statistical correlation between the sperm count and the hyaluronidase content in human semen. A similar relationship could be shown for the semen of other animals, although the absolute hyaluronidase content varied widely among different species. Calculations showed that the differences in hyaluronidase content in these species could account for the variation in the minimum sperm counts required for fertility. He described experiments in rabbits showing that up to 12 hours after mating or instilling hyaluronidase solutions into the vagina hyaluronidase could be recovered in washings from the lumen of the fallopian tube. He had also induced ovulation in female rabbits by an injection of gonadotrophin, which had been followed 7 hours later by an intravaginal injection of hyaluronidase; after a further 5 hours he had recovered denuded ova and had identified hyaluronidase in the tubal washings. From the fallopian tubes of control animals, given the gonadotrophin injection and distilled water per vaginam, ova within their cumuli and no hyaluronidase had been recovered. Trials were to be made on humans of the effect of hyaluronidase in sterility due to oligospermia. The hyaluronidase would be administered as a tablet or solution placed in the vagina before intercourse, or by addition to the husband's semen which would be artificially inseminated.

Antigenic Properties of Spermatozoa

The CHAIRMAN said that when spermatozoa were injected into an animal of a different species the recipient's blood was found to contain antibodies which could be demonstrated in vitro. The resulting antiserum reacted in high dilutions with spermatozoa of the species against which it had been raised, and in lower titres with the spermatozoa of other species. An antiserum prepared in a sheep against rat spermatozoa agglutinated in vitro the spermatozoa of the rat; less strongly those of the guineapig, rabbit, and dog; and slightly those of the human. It was difficult to show that antispermatozoal immune-bodies had any effect in vivo. For example, the passive immunisation of male guineapigs with large quantities of a potent antiserum prepared by injecting guineapig spermatozoa into a rabbit did not affect the condition of the epididymal spermatozoa, nor the production of spermatozoa by the guineapig testis. The evidence on the possibility of active iso-immunisation of an animal was conflicting. Positive results had been based mainly on complement-fixation tests. He himself, using as a criterion the in-vitro agglutination of spermatozoa, had consistently failed to find antibodies against rabbit spermatozoa after injecting rabbit spermatozoa into rabbits. Furthermore, this treatment had affected neither the sperm count and fertility of male rabbits nor the fertility of females. With vaginal insemination in female rabbits, a weak antibody response had sometimes been evoked, but only against heterologous spermatozoa, and less regularly than with injection by other routes. There was thus little experimental support for the theory that sterility in humans might result from injection of heterologous spermatozoa; and there was still less evidence of its production by natural or artificial insemination; among 13 women whose failure to bear children was inexplicable in terms of anatomy, physiology, or pathology the serum of only one showed a trace of antispermatozoal activity in vitro.

Artificial Insemination

Dr. **Margaret Hadley Jackson** and Mrs. **Clare Harvey** discussed their results with artificial insemination in infertility, using semen obtained from the husband, and compared the results with those where a donor's semen was used. Their cases had been carefully selected to exclude couples who appeared at all likely to produce children unaided; all the selected cases had been practising intercourse without contraception for at least two years. Artificial insemination with the husba semen was practised 165 times on 40 selected patient whom one received as many as 32 inseminations others only 1. There resulted only 2 pregnancies, one which terminated in a miscarriage and the other in a birth. Of these 40 women, 15 who were subfertile recei donor semen mixed with the husband's semen, and were finally treated with donor semen alone. All 15 husbands of this series had had repeated semen te of which 40 % were unsatisfactory in some, and 60-10 in the majority. From 41 inseminations with do semen mixed with the husband's semen there . only 2 pregnancies, of which one led to a live birth a the other to a miscarriage. Of the 5 women who recei donor semen alone (the total number of inseminatio being 27) none became pregnant. In 7 of these women pregnancy subsequently occurred as a result normal intercourse. In another series of 34 selected ca of infertility, artificial insemination with donor sem of high quality was performed on 254 occasions. The resulted 17 pregnancies, with 13 live births, 1 stillbir 1 miscarriage, and 2 which had not yet ended. Th concluded that artificial insemination with the husband semen did not yield good results, and that natur intercourse was more likely to be successful.

Habitual Abortion

Dr. **Raymond Cross** described the series which reported elsewhere in this issue. A lively discussio followed, in which the lack of controls in Dr. Cros experiment was criticised and the statistical significan of his results questioned. The dangers of using tox substances without urgent indications was stresse Other speakers claimed excellent results in the treatme of habitual abortion with simple measures, such as re in bed or even injections of distilled water.

Reviews of Books

Gynæcological Endocrinology for the Practitioner

P. M. F. **Bishop**, D.M. Oxfd, lecturer in applied physiology, Guy's Hospital. Edinburgh: E. and S. Livingstone. Pp. 124. 7*s*. 6*d*.

In this small useful book the endocrine control of the menstrual cycle is briefly discussed and the various sex hormones available for therapy and their methods of administration are set out. Dr. Bishop dismisses the natural œstrogens with the remark that they "have only one disadvantage—they are expensive"; and goes on to describe all treatment with œstrogens in terms of stilbœstrol. Many practitioners, however, still have a not entirely unfounded prejudice in favour of the natural œstrogens. He rightly stresses the dangers of continuous œstrogen therapy, and notes that very different doses are needed and can be tolerated in different physiological and pathological states: for instance, low dosage is needed during the menopause and high dosage during pregnancy. He mentions the uncertain results at present obtained with gonadotrophins, and gives a short account of pregnancy tests and hormone assays. Guterman's pregnanediol colour-reaction test might with advantage have been discussed; though its value and accuracy are not yet fully established, it promises to be clinically helpful both in detecting a tendency to abort and possibly in establishing the time of ovulation. Tables listing the various commercial products by name and giving their dosages and current prices are convenient. Dr. Bishop has remained nicely detached and free of dangerous enthusiasms, and has packed a great deal into small space.

The Nervous Child

(5th ed.) **Hector Charles Cameron**, M.D. Camb., F.R.C.P., consulting physician to the children's department, Guy's Hospital. London: Oxford University Press. Pp. 252. 10*s*. 6*d*.

In this book, first published in 1919 when child psychiatry in Great Britain was in its infancy, much of the original writing remains; and since it was based upon clinical observation of the behaviour of nervous children, and the attitude of their parents and nurses towards them, it has stood the test of time. Not only in the chapter on disturbances of metabolism but throughout the book, the psychosomatic conception illness and the interplay of mind and body in child healt are well portrayed. Sound advice is offered on th healthy upbringing of children and on the managemen of nervous symptoms. New material includes addition to the sections on enuresis, on night terrors, and o habitual vomiting of infancy. Both the plea to th psychiatrist in his dealings with children "to remembe how often the nervous disturbance is erected upon physical basis," and the statement that "the hygien of the child's mind is as important as the hygiene of hi body, and both are studies proper for the doctor" ar timely. The book is intended primarily for the guidanc of the medical practitioner, but can be recommende to any who are concerned in the practice of chil health.

Surgical Nursing and After-treatment

(9th ed.) H. C. **Rutherford Darling**, M.D., M.S. Lond F.R.C.S., surgeon, Prince Henry Hospital, Sydne London: J. and A. Churchill. Pp. 604. 12*s*. 6*d*.

For some 29 years this book has filled an importan place in the teaching of the nursing profession. M Darling has been thorough—keen to embody every littl advance, every little change or trick, in the passin years. But as Schiller observed "an artist may be know rather by what he omits." The tired nurse, working fo examinations in her spare time, must have the cro winnowed for her: she does not need to know abou "cardiac energy" or the "shock" index, about old fashioned Kimpton tubes or paraffined methods fo blood-transfusion, or even about somebody's pet metho of packing the rectum. What nurse sees a Phelp's bo used, or a petticoat tube for secondary hæmorrhage, o a Bavarian or Delbet splint? If the doctor likes t order some particular old-fashioned method, let hi explain to her how to use it. The book is too full for th present State course: the 700 pages make it longe than the shorter surgery textbooks for medical students The nurse's mind is no sponge, and there are limits t the amount that she should be expected to absorb i her scanty studying time. It would be far better t concentrate on selected details of the management of th cases she usually encounters: and in fact the book does give a good account of postoperative diet and othe nursing points. It has real merits, but it does not show the nurse the way through the wo

CORONARY CIRCULATION

Clinical experience indicates that theophylline-ethylenediamine may be a useful adjunct to the routine treatment of coronary insufficiency and for decreasing the frequency and severity of anginal attacks

Cardophylin

A SPECIALLY PREPARED COMPOUND OF THEOPHYLLINE-ETHYLENEDIAMINE

VASODILATOR • RESPIRATORY STIMULANT • DIURETIC

IN TABLETS FOR ORAL USE, AMPOULES AND SUPPOSITORIES
LITERATURE AND SAMPLES ON REQUEST

MANUFACTURED BY **WHIFFEN & SONS, LIMITED • CARNWATH ROAD • FULHAM • LONDON • S.W.6**

An acceptable Stimulant

For debilitated patients and during convalescence, Tintara meets the difficulty of prescribing a stimulant that is both effective and readily taken. The fine flavour of this Australian Burgundy makes it acceptable to the most delicate. Produced from grapes grown on ferruginous soil, Tintara contains no added alcohol or sugar. It is a well balanced wine of minimum acidity and is entirely free from drugs.

Every effort will be made to supply Tintara when urgently required

Burgoyne's TINTARA
BURGUNDY

P. B. BURGOYNE & CO. LTD., DOWGATE HILL, LONDON, E.C.4 *Phone City 1616*

Stimulus to Intestinal Peristalsis

I-SO-GEL, a granular preparation of certain dried mucilaginous seeds, has the property of reproducing the normal stimulus to intestinal peristalsis by increasing the intestinal bulk, through absorption of water in the alimentary canal.

I-SO-GEL contains no purgatives and is a purely natural laxative with a smooth mechanical action, specially suitable for the constipation of diabetes.

It is valuable also in mucous colitis, dysentery, hæmorrhoids, and intestinal flatulence. After the performance of colostomy, I-so-gel gives excellent results by solidifying the fæces.

In bottles at 3/4 and 11/8½ each, including Purchase Tax.

I-SO-GEL

GRANULES

ALLEN & HANBURYS LTD · LONDON · E·

TELEPHONE: BISHOPSGATE 3201 (12 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

THE LANCET

LONDON: SATURDAY, NOV. 23, 1946

The Small Ones

The Act provides that on the appointed day all voluntary and public-authority hospitals shall be transferred to the Minister of Health, except those he does not require for the National Health Service. Just what does this mean? The definition of a voluntary hospital is very wide, including as it does "any institution for the reception and treatment of persons suffering from illness" which is "not carried on for profit," and it thus comprises a variety of institutions ranging from the big general hospital to the small holiday-home which completes the treatment of the sick by giving them a holiday at the seaside. Between these extremes come a large (though unknown) number of small establishments, of which there is as yet no central record Most of these are homes either for the convalescent or for the chronic sick. Generally they are self-owned, and many of the people who manage them are still unaware that the National Health Service Act has any bearing on their activities.

What will be the best way of dealing with this mass of minor institutions? Unlike the hospitals they have no expensive apparatus and technical staff, and their chief asset is the devotion to the sick which inspires their management. This is a more delicate flower to preserve than the technical attributes of the big hospitals, but it is very well worth preserving. There is grave risk of its withering and fading under detailed control, and it seems to us that the intervention of authority should here be kept to a minimum. Where, as in hospitals, medical excellence is the main criterion, there is need of enough central influence to ensure the full use of scientific resources; but lower in the institutional scale, as technical efficiency grows less important and human relationships—"atmosphere"—more important, the advantages to be expected from such influence decrease. The smaller institutions intended for rest and recuperation will, we imagine, require control only so far as the safeguarding of public funds s essential, and may otherwise be left to themselves with only such distant supervision as an occasional official visit affords. A travelling accountant and visits from time to time by official visitors (both medical and lay) would be enough to ensure that proper standards are kept up, leaving the institutions themselves to build up their own particular methods of keeping the patients happy and contented. For this is the essence of the treatment which most of these homes exist to provide. Many of them, at least, are intended for patients who have done with medicine and now need only the natural stimulants—fresh air, exercise, good food, and pleasant occupation—to restore them to the state of health necessary for facing their daily work and troubles.

Whether or not it takes them over, the State will become responsible to some extent for these places, if only because their demise would throw their work back on the State itself. Cannot the maternal genius of unselfish people be left to preside over them, while the Ministry contents itself with the fatherly duties of watching over the little ones and paying the bills?

Streptomycin in Non-tuberculous Infections

STREPTOMYCIN, which was introduced by SCHATZ, BUGIE, and WAKSMAN[1] in January, 1944, as likely to be valuable in a variety of infections, is still known at second hand only to most doctors in this country, and it has been heralded chiefly as a potential weapon in the conquest of tuberculosis. But American reports make it clear that its proper assessment in tuberculosis will take a long time. Meanwhile evidence of its benefits in other conditions is accumulating, and a committee of the National Research Council[2] has lately reported on its use in 1000 miscellaneous cases.

Originally streptomycin was measured in terms of its activity against *Bact. coli*, but since the hydrochloride and sulphate salts have become available a microgramme of the pure streptomycin salt has been taken as equivalent to one unit; a gramme of the pure substance is then equal to 1,000,000 units. The streptomycin salt is a light yellow powder, usually supplied in ampoules. It is very soluble in water, and comparatively thermostable, though over long periods it is desirable to store it in a refrigerator. It is most commonly given by intermittent intramuscular injection. Intravenous administration produces a much higher initial concentration in the blood-stream, but after about 2 hours the blood-level falls below that attained by the intramuscular injection of an equal quantity. With ordinary dosage by either route traces of the drug can still be found in the serum after 10–12 hours. Injection into the muscle is painful at the time and for 24–48 hours afterwards, and a persistent ache may be felt at the site of repeated injections. The addition of procaine minimises the initial discomfort. The drug has sometimes been given in dilute solution by intravenous drip, but this route is generally undesirable because of possible toxicity, either of the drug or its impurities. It is not significantly absorbed by mouth, and this route is used only when the intention is to reduce the bacterial content of the intestines. Absorption from the respiratory tract after inhalation is also negligible. After parenteral administration it reaches peritoneal, pleural, and intraocular fluids, but not collections of pus, such as in empyemata It also appears in the bile, and in the fœtal circulation and amniotic fluid. Normally the concentration reached in the cerebrospinal fluid after systemic injection is low, but there is some evidence[3] that a much higher concentration develops in meningitis. Nevertheless it is usually given intrathecally as well as systemically in meningitis; and indeed into pleural and peritoneal cavities also, when local infections make it desirable.

Dosage varies widely, and attempts are made to relate the blood-level to the sensitivity of the organism concerned. In general 2–4 g. is given daily intramuscularly, usually 4-hourly. Intrathecally, 25–100 mg. in 5–10 c.cm. of saline once in 24 hours is suffi-

---

1. Schatz, A., Bugie, E., Waksman, S. A. *Proc. Soc. exp. Biol., N.Y.* 1944, 55, 66.
2. Keefer, C. S., Blake, F. G., Lockwood, J. S., Long, P. H., Marshall, E. K., Wood, W. B. jun. *J. Amer. med. Ass.* 1946, 132, 4.
3. Adcock, J. D., Hettig, R. A. *Arch. intern. Med.* 1946, 77, 179.

cient. For oral use 2–3 g. per day, given at 6-hourly intervals, is required Excretion is mostly by the kidney, and 60–80% of the dosage is normally found in the urine within 24 hours of administration. Therapeutic levels in the urine are therefore easily obtained. Many factors relating to dosage are still *imperfectly understood* For example, several investigators have reported a rapid increase in resistance to streptomycin in vivo, and WELCH and colleagues [4] have found experimentally in mice infected with typhoid that certain concentrations of streptomycin injected intraperitoneally actually increase the fatality-rate. The tolerance of bacteria to the drug may be increased four to eight times in the presence of blood or serum. A patient often varies in his rate of absorption, distribution, and excretion: and it is always uncertain that two patients with the same infection will react alike. Assessment of sensitivity of an organism in vitro often seems to bear little relation to the clinical response to what ought theoretically to be adequate dosage. It is not surprising that the duration of treatment required is also very variable: in general it is from 5 to 14 days.

Judging by the results of the American investigators in their 1000 cases, highly satisfactory results may be looked for in various kinds of gram-negative meningitis and septicæmia, if treated early, in tularæmia, and to a rather less extent in urinary-tract infections. In the treatment of meningitis they agree with CAIRNS and colleagues [5] that when treatment is delayed there is little prospect of benefit. Limiting factors in urinary infections include the presence of mixed organisms, irremovable local lesions, variations in sensitivity of organisms, and sometimes the development of extremely rapid resistance in vivo. The results in typhoid, salmonella infections, and brucellosis are disappointing—"no dramatic results have been observed in any of these infections." In pulmonary infections with Friedländer's bacillus or *H. influenzæ*, and in peritonitis from gram-negative infection, the results are difficult to assess but sufficiently encouraging to justify further extensive trials. Much work has also been done with experimental disease in animals; syphilis in rabbits and plague in mice have both proved susceptible to streptomycin, though in syphilis it is much less effective than penicillin. One report of success in experimental brucellosis in guineapigs [6] is unfortunately not paralleled in man.

Toxic reactions to streptomycin are comparatively frequent, the overall incidence in the National Research Council's 1000 cases being 20%. Headache, flushing, fever, and vertigo are among the commonest complaints, apart from local pain and irritation at the site of injection. Skin rashes are also common, developing mostly during treatment. They are erythematous, urticarial, maculopapular, or even hæmorrhagic in type, and may persist for a week or longer. If treatment is continued after the appearance of a rash much care is required, as other signs of sensitisation may appear. Neurological effects are the most disturbing of the toxic manifestations, although they tend to develop late and with lar doses only. BROWN and HINSHAW [7] report th caloric stimulation and turning tests show gradu impairment of labyrinthine function during strept mycin therapy, and that deafness and tinnitus m result from a toxic action on the cochlear apparatu The disturbance of equilibrium may be permanen but may be relieved by the development of com pensatory balancing mechanisms. Deafness tends recover with cessation of treatment, and may in som cases be the result of the primary disease. T incidence of toxic reactions begins to rise sharp when a daily dose of 1 g. is reached, and wh the daily dose is 4 g. or more the inciden reaches 60%.

The groundwork of investigation has been succes fully planned and put into effect in America, b there is much to be done before we know as muc about streptomycin as about penicillin. Distributi of supplies in this country is likely to follow t pattern cut for penicillin—a gradual widening availability as more of the drug is made and knowledge becomes precise enough to ensure th supplies are not wasted. Meanwhile streptomycin bound to be exceedingly scarce. In Berlin toda some relief from the shortage of penicillin is bei sought in the extraction of the drug from the urine patients who have received it. This was done here al in the early days, and it was then remarked th passage through the body removed impurities respo sible for febrile reactions. The evidence that 60–80 or even more of the total dose of streptomycin may excreted in the urine prompts the suggestion th methods of urinary extraction should again be explore

"I Was There"

THE campaign in Burma, so well described in th official account,[1] taught several medical lessons more than temporary value, both in epidemiolog and in the treatment of traumatic injury. Excep for the war in the Gran Chaco no major campaign modern times has been fought in the tropics, and th application of the lessons learnt in temperate and su tropical climates raised several interesting point Heat-stroke, inseparable from the deserts of the su tropics, was seldom seen; an annual rainfall 200 inches concentrated into three months was n bar to active warfare; snake-bite was little mo than an old wives' tale. The proportion of infecte wounds was very high but gas-gangrene was rar the streptococcus was an uncommon infecting age but the staphylococcus replaced it only too efficientl The major problem of the surgeon was evacuatio and in the early campaigns in the Arakan it wa necessary to move the wounded man, from ambulanc to ferry to ambulance to train, twenty-one tim before he reached a general hospital Air transpor for casualties had been used before, but never had it effects, on surgery and on morale, been so strikin as in 1945. A soldier wounded by the Irrawadd might be flown out in a light aeroplane from a 200 yard strip cut in the jungle. Within a few minute he was in a C.C.S., located at a strip long and fir enough to take a Dakota air ambulance. The sam evening he was in bed in a general hospital in Comilla 500 miles away. The system had a flexibility that allowed for almost any peculiarities of weather or terrain, and established welcome liaison between the line and the base. The consulting surgeon was as likely to be found at a main dressing-station as in his office.

---

[4] Welch, H., Price, C. W., Randall, W. A. *J. Amer. pharm. Ass.* 1946, 35, 155.

[5] Cairns, H., Duthie, E. S., Smith, H. V. *Lancet*, August 3, p. 153.

[6] Live, I., Sperling, F. G., Stubbs, E. L. *Amer. J. med. Sci.* 1946, 211, 207.

[7] Brown, H. A., Hinshaw, H. C. *Proc. Mayo Clin.* 1946, 21, 347.

[1] The Campaign in Burma. H.M. Stationery Office. Pp. 175.

Infectious diseases were prevalent enough, but, with one exception, they were those common to other theatres of war. Malaria, as always, had local peculiarities which had to be learnt before it could be overcome. Mepacrine, administered under strict discipline, had by 1945 reduced this menace to insignificance, and the Australians in New Guinea showed that the incidence might have been even lower. The war ended too soon for 'Paludrine' to receive a field trial. Dysentery of both kinds was, as in most theatres, the most distressing and intractable of camp-followers, and the gradual lowering of its incidence reflects great credit on the "hygiene wallahs" The syndrome of anæmia, lethargy, and diarrhœa, which came to be known as "para-sprue," remained an unsolved problem to the end. Infectious jaundice was as common as elsewhere. The only disease of which few had had experience and which might have been a problem of the first magnitude was scrub-typhus. This was never conquered, but enough was learnt of its natural history to make its incidence trivial among the other hazards. A comparison of the health of captured Japanese with that of our own troops was a great testimonial to preventive medicine and the value of the various research teams associated with the Allied forces.

Where the war in Burma differed radically from all others was in the revolution in the supply services. General WINGATE had suggested sending stores "down the chimney, like Father Christmas," and that was done. It was an inspiring sight to see the aeroplanes leaving Hathazari loaded with everything which the Army might need, down to the daily newspaper, *S.E.A.C.*, whose editor has written the official account. Bandages, splints, mepacrine, and penicillin went up in the aeroplanes that brought the wounded back.

Of morale it is hard to speak. Military circles will continue to argue the value of the airborne penetrations by the Chindit columns, but no-one has yet found praise enough for the men who made them. It is perhaps characteristic of the morale in Burma that WINGATE'S last message—"One day you will be proud to say 'I was there'"—became the nickname of a species of hat[2] not recognised in the dress regulations of the Indian Army.

---

[2] An overgrown and amorphous deerstalker of quilted drill.

Annotations

PERSPECTIVE

"HAS anybody heard any good news lately?" Mr. Donald McCulloch put this question to last week's Brains Trust; and there was silence. To the British people good news would be a welcome tonic, for things are not as most had thought to find them nearly eighteen months after the end of the war. Measuring our present utilitarian habits against the distant pre-war life by its chances for variety in food and scene and clothing and a hundred other intrinsically unimportant items, we see that the old standard is still far beyond reach. In the wider sphere, too, those who spoke of, and believed in, the moulding of a better world as the first task to which the nations should turn their hands now find such talk strangely hollow against a background of international bickering. Yet these disappointments have given rise to no spirited questioning and to no incisive call to action; for we are touched with the same malaise as after the first world war—a fatigue of which we were largely unaware during the struggle itself.

If, in surrender to this exhaustion, we are indifferent to our own affairs, we are perhaps doubly careless of others'. Hungry Germany is a case in point, though here there is the excuse that tales of famine have so long been part of the daily news that they no longer carry their former impact of shock and urgency; as with the war-time casualty lists, the implications of the printed word are obscured by constant repetition. Moreover, though there is general want, there is not yet stark famine in Germany; subsisting on a basic ration that has wavered from about 1500 to under 1000 calories, the western German still lives in the narrow borderland that divides malnutrition from frank starvation. The newspapers, on which we largely rely for our knowledge and judgment of human events, though they have conscientiously reported this state, have been hindered in giving it full weight by the poor news-value of the subject. Fires and murders, battles and burglaries—these, having beginning, incident, and climax, lend themselves to graphic description. Famine or near-famine has no such definite phases; its drama is reserved for those who see and those who suffer; the plot varies little from Monday to Friday, or from Cologne to Chungking; and its dénouement in swollen numbers of sick and dead make chilly reading.

Nowadays even the sober accounts which come out of Germany are often suspect. Were there not for nearly four years stories of terrible want in western Europe, which were ended only when the liberating armies found that, except in Holland and a few towns elsewhere, conditions had almost all along been tolerable? Some recall the Germans' buxom health in the early days of occupation, their well-stocked larders, and their weekly trips to the country from which they returned laden with produce. Having been the best-fed people in Europe for five years, so the argument runs, they can now best afford to starve; and anyhow the official ration is not the only regular source of food. These contentions take no regard of the fact that the initial advantage was lost last winter; and that since then the country folk have had no further surplus for the town-dwellers who form the bulk of the British zone's population. For all except the lucky few who have the money to buy in the black market the official ration is now the total ration. The final argument is that the German people alone are answerable for their present predicament. Even this is hardly correct, for we assumed the reins of government and thus, by implication, responsibility for the people we govern; it is we who, by agreement with the other occupying powers, have divided the country into discrete sections so that there has been no free exchange of manufactured goods from the urban west for food from the rural east; and it is we who, following the Potsdam agreement, have so reduced the economic strength of our zone as to cripple its purchasing power. "Eighteen months after the surrender," writes an *Observer* correspondent,[1] "the German inhabitant of the British zone faces a second winter of hunger and cold without the stocks of food, fuel, and clothing he had a year ago, weakened by six months of starvation-rations, and with a feeling of utter hopelessness, despair, and bitterness."

---

[1] Nov. 17

PENICILLIN IN ACUTE NEPHRITIS

THE generally accepted view of the lesion in acute glomerulonephritis—Ellis's type 1 nephritis—does not encourage the hope that the condition would be benefited by sulphonamides or penicillin. The sulphonamides, despite enthusiastic early reports, have in fact provided no substantial advantage, and their toxic effects are often serious. The freedom of penicillin from this disability, and the clinical impressions of benefit, such as that recorded by Moncrieff,[1] together with the observed relationship of infection to nephritis, call for further investigation of its effect. From experience with 25 cases, 10 of them afebrile, Sen [2] concludes that in children with febrile conditions associated with nephritis penicillin may minimise the illness by dealing with the focus of infection. Furthermore, even in afebrile cases he has noted a rapid increase in urinary output, and general clinical improvement; and he suggests that penicillin has a direct influence on the kidney itself, whereby the illness is shortened. Unfortunately he has not been able to observe a control series, and the information he gives about the original infection and the clinical condition is incomplete. At present the claim must be regarded as unproved, but a carefully controlled assessment is clearly desirable.

BRITISH NATIONAL HEALTH INSURANCE

THOUGH compulsory insurance against sickness and accident was instituted in this country on a national scale at so comparatively recent a date as 1911, voluntary health insurance had by that time been operating for several centuries. The social guilds of the Middle Ages, whose records, collected in 1388–89, may be studied in the Public Record Office in London, provided cash benefits to their members in time of sickness; and after the guilds had been suppressed by Henry VIII new agents of voluntary health insurance appeared in the friendly societies. Some steps had even been taken towards compulsory health insurance. In 1697 a scheme of health insurance on a compulsory basis was published by Daniel Defoe; and in 1786 the Rev. John Acland, rector of Broad Clyst, Devon, worked out a scheme of compulsory health insurance, which, embodied in a Bill, was introduced into the House of Commons in 1787 but failed to secure a second reading. In 1757 a statutory obligation to insure against sickness was imposed on coal-heavers working on the Thames, and in 1792 a similar scheme was applied in the coal trade on the Wear.

Prince Bismarck was the first to cause a national scheme of compulsory health insurance to be enacted, though local schemes had then been long in operation in Germany. His scheme, which, it was said, was introduced to trump the long suit of the Social Democratic Party, became law on May 31, 1883, and came into operation on Dec. 1, 1884. In 1909 it was studied on the spot by Mr. Lloyd George, who, in his Budget speech of that year, spoke of it in glowing terms:

> "And a superb scheme it is. It has saved an incalculable amount of human misery to hundreds of thousands and possibly millions of people who never deserved it. Wherever I went in Germany . . . men of all ranks, sections, and creeds of one accord joined in lauding the benefits which have been conferred upon Germany by this beneficent policy."

Mr. Lloyd George added that the Government intended to bring in a scheme of national health insurance. It was brought in as part of the National Insurance Bill, which, introduced into the House of Commons on May 4, 1911, and, drastically amended to meet the criticisms of the medical profession, received the royal assent on Dec. 16, 1911.

The scheme as presented to Parliament was based
the German model, and contained provisions to wh
the medical profession strongly objected. At the in
tence of the British Medical Association many ame
ments were made, the most important of which we
(1) the administration of medical benefit was transfer
from the approved societies to specially created insura
committees containing representatives of the medi
profession ; (2) all registered medical practitioners w
given the statutory right to have their names plac
on the list of doctors undertaking the medical care
insured persons ; (3) insured persons were given
statutory right to choose, and change, their insura
doctors subject to acceptance by the doctor ; (4)
every insurance-committee area a local medical co
mittee was to be formed, recognised by the Governm
as representing the medical profession of the area, a
charged with certain important administrative functio
As a result of these provisions, which embodied princip
for which the German doctors had long been contendi
the medical profession has coöperated with the Gove
ment in the administration of the British system, wh
operation has been free from the embittered *disput*
between the profession and the administrative authoriti
that had been not uncommon in Germany. The B.M.A
in their evidence submitted to the Royal Commissi
on National Health Insurance, not only recommend
the continuance of the health-insurance system b
urged that it should be extended to include the depe
dants of insured persons and to provide a wider ran
of service. The royal commission, reporting in 192
recommended that such extensions should be ma
"as and when opportunity offers and funds beco
available" ; but, being impressed with the difficul
of retaining the insurance principle in a service of wid
scope, added :—"The ultimate solution will lie, we thin
in the direction of divorcing the medical service entire
from the insurance system and recognising it along wi
all the other public health activities as a service to
supported from the general public funds."

The change foreseen by the royal commission is no
on the eve of accomplishment. The Insurance Medic
Service, as a separate service, will soon be a thing of t
past ; it will be merged in a complete National Medic
Service. The British health-insurance system is unde
going a profound change. A new period in its histo
is opening, and the time is propitious for a comprehensi
review of the system—a review that should include
account of the sources from which it sprang and of i
actual working and development, and an appraisal
the measure of success it has achieved. Mr. R.
Harris has presented such a review in his book *Nation*
Health Insurance in Great Britain 1911–46,[1] which w
be found very useful by students of health insuranc
whether in this country or abroad. Mr. Harris h
unique qualifications for writing on the subject. As
civil servant he was associated with the late Mr. W.
Braithwaite in helping Mr. Lloyd George to steer t
National Insurance Bill through Parliament, a tas
involving preparations for the reception of innumerab
deputations and the answering of innumerable inquiri
He was one of the first-appointed members of the sta
of the English Health Insurance Commission, and becam
an assistant secretary in the Ministry of Health ; an
since his retirement from the civil service he has bee
chairman of the medical service subcommittee of th
London Insurance Committee. His book embodies a
experience of health-insurance administration extendin
over 35 years and will be of permanent value. Th
narrative of events is not carried further than Septembe
1945, and no account is given of this year's legislation
though the circumstances leading up to it are discusse

---

[1] Moncrieff, A. A. *Lancet*, 1944, ii, 706.

[2] Sen, S. *Amer. J. med. Sci.* 1946, 211, 289; *Indian Physician*, 1946, 7, 151.

[1] London: George Allen and Unwin. Pp. 224. 12s. 6d.

a way that throws light on present difficulties and ntroversies. There are, however, some curious omis- ons; including the lack of an index. No reference is ade to Henry Ratcliffe, who was the first to place iendly-society finance on a sound actuarial basis, or to r Robert Morant, without whose administrative genius id immense driving power the health-insurance system uld hardly have got under way in the short seven onths allotted for the purpose.

HOW LONG DEAD?

The scientific aids towards identifying a person found ad have increased enormously in number and efficiency the last few decades, but Simpson[1] shows that they ve not made easier the job of assessing the time of ath. X rays, blood-groups, dentition, estimation of ight from a small piece of limb bone—all these are valuable in deciding on the victim's identity, but tell s nothing about the hour of death. Simpson holds that e most reliable guide is the steady fall in temperature hich takes place up to twenty-four hours after death. nder average conditions about 2·5° F is lost each hour r the first six hours, and 1·5°–2° F for each of the next x hours. Calculations based on these figures may be pelessly upset by extremes of temperature, the amount clothing the man was wearing, ventilation, and vironment—thus a body in a river will reach the mperature of the surrounding atmosphere much more ickly than one on dry land. If parasites, such as fleas r body lice, are present, the entomologist may help by ding out whether these creatures are still alive, and, so, how long it takes to revive them. Adipocere may nder rather than help, for the hydrogenation of body t is notoriously variable; it may take place in three four weeks (with warmth), or may be delayed well yond the four to five months which is the average r this country. The onset of rigor mortis and of post-ortem staining are of little use in placing the time of ath accurately. All in all, Simpson seems to place ost reliance on body temperature. "It is never too te," he says, "to measure the temperature in the hope at, though 'the body is cold,' it may still register a w degrees above that of the surroundings." He quotes an example a murder at Hastings where the body mperature was still 7° F above air temperature, after ghteen hours in the snow, and this made it possible to x the time of death within an hour.

VARIOUS OPINIONS ON B C G.

Several months ago the Ministry of Health received om bodies interested in the prevention of tuberculosis memorandum recommending the supply and use of C.G. in this country[1]; and the Minister has lately nounced that B.C.G. is to be manufactured in this untry. This may make it possible to undertake the ntrolled investigation for which workers here have ped, and it will be well to take account of some of e pitfalls and possible disappointments indicated by recent report from America. Leviné and Sackett[2] ccinated with B.C.G. a series of young children from berculous families in New York City. No child above e age of one month was accepted unless the tuberculin st and radiological and clinical examinations were gative; with parenteral vaccination, 85% became berculin-positive. At first an attempt was made control the study by dividing the children into two qual groups—those to be vaccinated and those to be sed as controls—a physician being assigned to vaccinate alf the cases; and between 1927 and 1933 altogether 90 children were studied in this way. The results were npressive, for there were only 3 deaths from tuberculosis amongst the vaccinated compared with 18 among the controls; in other words the number of deaths from tuberculosis was four times greater (3·38%) in the control group than in the vaccinated group (0·68%). Experience showed, however, that selection was taking place; there was a tendency to inoculate the children of the more intelligent and coöperative parents and to keep the children of the uncoöperative parents as controls.

From 1933 onwards alternate children were vaccinated, the selection being made before they were assigned to pædiatricians. Since some children had to be withdrawn from the investigation, the number of controls and vaccinated differed. Altogether 1094 children were studied, of whom 566 were vaccinated (all intracutaneously with 0·15 mg. B.C.G.) and 528 were controls. The tuberculosis deaths among the vaccinated were 8 (1·41%) and among the unvaccinated controls also 8 (1·51%). The possible effects of parental coöperation, economic conditions, racial distribution, exposure, lost cases, and percentage of autopsies were all assessed, but without the discovery of any factor vitiating the comparison. It was found that, among the children segregated in hospital for three months before and three months after vaccination, there were among the 91 vaccinated 1 death, and among the 96 controls 3 deaths, from tuberculosis; in the former group the child who died, though born of a mother who died of tuberculosis, was never exposed, whilst in the latter group one child who died had not been exposed as far as was known. Levine and Sackett regard it as dangerous to take children into hospital during the first three months of life; but they consider that, when a child is admitted, B.C.G. may have some protective value. They conclude that B.C.G. must be judged by the results in children vaccinated at home; and as a public-health measure they rate it below removal of the tuberculous subject from the home.

The Scandinavian countries, on the other hand, from long experience have no doubt of the value of B.C.G., which is being increasingly used. In Denmark, for example, the number of vaccinations has crept up from 82 in 1934 to 40,000 in each of the last two years. The tuberculosis dispensaries are being overwhelmed by this extra work; and at a recent meeting of the Danish Association of Tuberculosis Doctors[3] it was suggested that general practitioners, whose interest has hitherto been lukewarm, should be offered courses of instruction so as to win their active participation. While the administration of the vaccine seems to be plain sailing, its production demands constant skill and attention. Dr. K. A. Jensen, who has been culturing the strain since 1927, has found considerable difficulty in keeping it on the narrow path of therapeutic rectitude. "The ideal," he said, "is never reached. The man who is to cultivate the B.C.G. strain and keep it at a level of suitable virulence has a very responsible post. If the virulence falls, so will the percentage of persons becoming tuberculin-positive after vaccination . . . if the strain become too virulent, the number of complications will rise. Both events would be equally unfortunate, since each would bring B.C.G. into disrepute." In Denmark the vaccine has been cultivated on Sauton medium, with subcultivation about every two weeks.[4] The slow loss of virulence after repeated subcultivation was formerly corrected by several passages on bile-potato medium; but of late years the same effect has been obtained by more frequent transfers on the Sauton medium (every 7–10 days), thus corroborating experimental evidence that virulence depends essentially on the rate of growth on Sauton medium. Dr. Holm,[4] who heads the tuberculosis division of the State Serum Institute, is satisfied with the absolute safety of the vaccine. Its use is

---

Simpson, K. *Science Progress*, October, 1946, p. 713.

See *Lancet*, July 27, p. 138.

Levine, M. I., Sackett, M. F. *Amer. Rev. Tuberc.* 1946, 53, 517.

[3] See *Nord. Med.* Sept. 20, 1946, p. 2134.

[4] Holm, J. *Publ. Hlth Rep., Wash.* Sept. 6, 1946, p. 1293.

now being extended beyond those particularly at risk to others, including all tuberculin-negative soldiers in the Danish army; and the present trend is towards the vaccination of all school-children. This year a tuberculosis survey has been initiated for the population of Copenhagen, to include tuberculin-testing and vaccination of all the tuberculin-negative aged 15–35 years.

DOSAGE OF CURARE

THERE are now on the market two preparations of curare for use in anæsthesia, one amorphous and one crystalline; both depend for their activity on *d*-tubocurarine chloride but they differ in potency, the amorphous preparation 'Intocostrin' having about a quarter of the activity of the pure crystalline material. This difference is a source of danger and might result in serious accidents. There is also some evidence of wide variations in individual reactions, depending to some extent on the patient's state of health. Thus in one otherwise healthy man with a recent perforated gastric ulcer as little as 5 mg. of the crystalline material produced adequate muscular relaxation, and 15 mg. would probably have been a considerable overdose. The anæsthetics committee,[1] jointly appointed by the Medical Research Council and the Royal Society of Medicine, are considering the standardisation of curare. Meanwhile they recommend that dosage should be based on the individual reaction to an initial small injection rather than on any dose/weight ratio. In the average healthy adult this initial dose could be 10–15 mg. of crystalline *d*-tubocurarine chloride or 40–60 mg. of intocostrin.

ADVERTISEMENT OF PROPRIETARY MEDICINES

LAST Monday the Hunterian Society met at Apothecaries' Hall, under the chairmanship of their president, Dr. J. B. Cook, to debate: That the Advertisement of Patent Medicines is a Menace to the Public. Mr. Hugh Linstead, M.P., speaking for the motion, admitted that the busy practitioner would be in difficulties if everyone had to come to a doctor for simple remedies. There had been great improvements in the materials and the advertisement of proprietary medicines since the Royal Commission of 1914. Nevertheless, much remained to be done. Advertisers obeyed the letter rather than the spirit of regulations; mention of "cure" was prohibited by newspapers, but "abolish," "kill," and other terms suggesting cure still appeared. There was still no control over postal advertising. There were too many worthless medicines on the market; prices were excessive; the disclosure demand was too often made the occasion for concealment; scientific terms were misused to mislead the ignorant; and advertisers played on fear. The Ministry of Health should shoulder the task of control as in Canada, where there was prohibition of the sale of proprietary medicines associated with claims for cure, or for which false, misleading, or exaggerated claims were advanced.

Dr. G. H. D. Day could not recall a single instance in which use of these medicines had delayed recourse to medical attention. The patent-medicine addict was the frustrated doctor-addict. These medicines did at least renew hope; and "an act of faith can alleviate symptoms, restore function, arrest disease, and promote healing." The sick man wanted a bit of magic. There existed in the patient a deep sense of the need for sacrifice. There was, too, an ineradicable impression that if the best was to be obtained it must be paid for. When the panel system came in the sale of patent medicines had soared; it would now again increase, because this was the only remaining altar on which to make a sacrifice. Notwithstanding all this, Dr. Day opposed their advertis for this had an element of duality. In childhood, were projected on to the bogyman; now these to be transferred to halitosis and B.O. Patients willing to accept this as punishment for their g feelings. "What have I done to deserve this?" often heard. Advertisements suggested that ill he was the common lot; and the sales depended on creation of ill health. The outrageous cost could forgiven, for it offered a chance for expiatory sacrif but the advertisements could not be forgiven, because increased the storehouse of anxiety and unhappiness

Mr. Arthur Mortimer, a director of the Beecham Gr opposing the motion, admitted that a few propriet medicine manufacturers work under reprehensible co tions; the reputable section of the trade would lik stop this. The difficulty in the control of advertisem was that the railways permitted advertisements w the newspapers refused. Any exaggeration was sin "puff" by manufacturers justly proud of their prod And was it right to stop all advertisement because a exaggerated? So long as the proprietary-medicine tr was rendering service—and there was nothing wrong w most of it—it should be allowed to advertise. industry would welcome legislation on the lines accep by Canada if it was going to help.

Mr. J. S. Walmsley, secretary of the Propriet Association, insisted that proprietary-medicine adverti was informative rather than persuasive. The valu advertising was in its results; no manufacturer c afford to advertise unless his product benefited patient. The advertisement of proprietary medic was more closely controlled than any other form advertising; and the quality of advertising had impro enormously since 1939.

In other speeches it was suggested that the pre conciliatory attitude of the trade is due to the ma facturers having seen the red light. A large majo supported the motion.

MEALS AND THE ELECTROCARDIOGRAM

SURPRISINGLY little is known about the effects of f on the electrocardiogram. Simonson and his colleagu have now studied the findings in twelve healthy yo adults before and after standard mixed meals and high meals of 942–1548 calories. The significant change the limb leads were an increase of heart-rate; an incr of K_{QT} (i.e., $QT/\sqrt{R-R}$); a decrease of the T wa the Q–T interval, and the duration of mechanical syst and an increase of the amplitude of QRS. In the c leads the T wave became more positive in CF_1, whil CF_2 and CF_4 it was decreased. Frequent but inconst changes were noted in the P wave, while there was li change in the P–R and QRS intervals, the Q wave the S–T segment. These changes were noted half an h after the meal and were still present an hour after meal. The next question to be investigated is the ef of a meal on the abnormal electrocardiogram.

TWO STAGES?

TUESDAY'S *Times* contained a letter from Sir He Bashford, late medical adviser to the Treasury, suggest that the Government should postpone provision general-practitioner services under the new Act until hospital services are working satisfactorily—in perh five years' time. "Meanwhile let general and pa practice go on as before." From such a source t proposal commands attention; but it would be idle ignore the public dissatisfaction it would cause, and difficulties it might create in administration of the n insurance scheme and in resettlement of ex-Serv doctors.

---

[1] The committee consists of: Dr. C. F. Hadfield (chairman), Prof. F. H. Bentley, F.R.C.S., Dr. C. Langton Hewer, Mr. R. Vaughan Hudson, F.R.C.S., Mr. Harold King, D.SC., F.R.S., Prof. R. R. Macintosh, D.M., Mr. F. C. MacIntosh, PH.D., Dr. M. D. Nosworthy, and Dr. G. S. W. Organe (secretary).

[1] Simonson, E., Alexander, H., Henschel, A., Keys, A. *Am Heart J.* 1946, 32, 202.

Special Articles

CONFERENCE ON MENTAL HEALTH

SOME PROBLEMS OF TODAY

At its first meeting, with Prof. J. M. MACKINTOSH in the chair, the conference, held in London on Nov. 11 and 15 by the Provisional National Council for Mental Health, discussed how to apply to the civilian population war-time experience of neurosis and backwardness in the Forces.

The Lessons of War

Dr. J. R. REES (medical director, Tavistock Clinic) said that the recent war gave us an opportunity of confirming much that was learned in its 1914–18 predecessor: but if little that is completely new has been learned of the nature and treatment of acute war neuroses, there have been considerable advances in prophylactic psychiatry, and in team-work among psychologists and sociologists. Large groups of men and women under discipline, sharing a common purpose and selected to some extent before admission to the Services, can of course be more easily managed than the free and more heterogeneous group in industry and the general community; but experiments done in the Army have some bearing on civil life, and methods can be adapted to meet civilian problems. In the first place, many men and women with long histories of minor neurotic difficulty gave first-rate service in the Army, and some were healthier and fitter than they had been as civilians. Those who had never been able to adapt in civil life were clearly unlikely to adapt easily to the challenges presented by the Army. It is no light matter to be uprooted from home, business, and friends, and all familiar grooves, and to be placed in an almost exclusively masculine environment, without privacy, and with what seems the complete loss of a carefully built-up individuality. Separation from home was by far the most potent single predisposing factor in psychiatric wastage; and, by study of the personality problems associated with it, it should be possible to lay down standards which would apply to such things as population-shift in civil life.

Some 15% of all passing through the General Service Selection (established in 1942) were referred by the interviewing officers to Army psychiatrists, either because of low intelligence or because they seemed unstable. Since the other Services had prior choice, the Army took a considerable part of the "psychopathic tenth" of the population. Many neurotic men, by selection, were kept out of combat, where they would have broken down and injured the morale of others, and were given work at the base, on the lines of communication, and in units which were not likely to see much fighting. Many who had come in before selection started and who did break down were admitted to hospital and helped up to a point—there was no time to achieve "cure." Those who could not be returned to their own units on discharge were fitted into jobs in line with their civilian interests and skills; and this plan, time-absorbing as it was, paid a handsome dividend. A high proportion of them gave good and willing service without any further breakdown. They were not cured, but they were able to be and feel useful, and to remain stable.

Effects of selection were specially remarkable, he said, among mental defectives. The dull man holds up training, and realising his inferiority he becomes anxious, breaks down, possibly malingers. What little malingering there was in the Army was largely among dullards, and some 70% of occupants of military prisons were men below the median on the intelligence scale. Eventually many of the most backward men were employed solely on manual labour, and worked contentedly. With good officers and N.C.O.s they became smart and reliable, with lower sickness- and crime-rates than good units of the field force.

Selection of officers proved most fruitful. Intelligence, character, and personality were assessed with increasing certainty, and psychological testing and interviewing found good men who would not otherwise have been accepted. If we can choose good officers he thinks it likely that good directors of industry, good schoolmasters, and good doctors can be chosen with even greater success. Training, moreover, can be fitted to capacity. The Canadian Army successfully used three-speed training—for the below-average, the average, and the above-average groups. Finally, much was learned about group-structure and group-therapy which must have a civilian application.

Dr. G. R. HARGREAVES (chief medical officer, Unilever Ltd.) said that mental-health work is done best by a team; and the pattern of the Army team proved to be the same as that of the civilian child-guidance unit. The work was partly detective—a study of the neurosis when it had already been acquired; and partly preventive—an examination of the social setting of the illness. Dullness, he noted, is often a social rather than a clinical problem. The industrial revolution largely destroyed the village community with its mixture of classes: nowadays people live in concentration camps—in suburbs or in housing estates. The small mixed community has gone, and the only two groups to which most people belong are the family unit and the work unit. The only effective integrated group to which the working man belongs is to be found in his industry; and industry has the great opportunity of carrying over the lessons in mental health learned in the Forces.

Dr. F. J. S. ESHER (medical officer, Sheffield mental-welfare service) said that he had tried placing a group of dull people in appropriate jobs, and on interviewing some 30–40 later had found them happy and doing well. Some have married happily: many defective girls, he said, keep good homes and look after their children well.

Dr. REES, summing up this part of the discussion, remarked on the importance of collaboration between vocational-guidance centres and the people who knew what jobs are available.

EMPLOYMENT OF THE HANDICAPPED

Dr. T. F. MAIN (medical director, Cassel Hospital) recalled that low intelligence is not the only problem of the mentally handicapped: they must also face failure, perplexity, loneliness, and fear of competition in the industrial field. Reading and writing are difficult, which means failure to follow the news, confusion, and insecurity. Human relations are not easy, and the dullard may cling to his own poor kind and marry among them. Many find a pattern of life which suits them, doing humble blind-alley jobs; but they are often in money difficulties because even an intelligent person would find it hard to handle similar responsibilities on like wages. They need a counselling service to which they can turn for advice on housing, rents, clothing, food, maternity services, education, and health. Without it they are often timid, unhappy, inefficient, ailing, despairing, sullen, and delinquent, and sometimes criminal. If their handicap is severe they may be helped by colony life, or by the new opportunities under the Disabled Persons Act. But those with less obvious handicaps are not easily identified. They don't walk into outpatient departments complaining of limited capacities. However, difficulty in holding a job is common in their records; and free expert medical assessment and advice might be offered to any worker who has consistently shown slowness in learning or difficulty in holding jobs, even if the overt reason for unsettlement is ill health. Fear of stigmatising the mentally handicapped could be avoided if the same assessment were offered to workers in other difficulties—to those with poor vision, for example.

Many dullards are relieved to find someone who will discuss their handicap practically and without patronage; and if this can be coupled with practical measures to find them suitable work they are grateful. If the present chronic flirtation of the Ministry of Labour and the psychiatric services is to ripen into an organised engagement and a solid marriage, he said, these, their children, will enjoy being legitimised. They have a high potential value in industry because they can happily undertake work which would bore the intelligent—manual work of a simple repetitive kind in a stable industrial background is the kingdom of the dullard. They need help in the settling-in period, so that they get a sense of "belonging" to the job and their fellows.

The epileptic, the schizoid, the obsessional, the depressed, and the hysteric also need special help—a sheltered transitional period before they return to now being extended beyond those particularly at risk to others, including all tuberculin-negative soldiers in the Danish army; and the present trend is towards the vaccination of all school-children. This year a tuberculosis survey has been initiated for the population of Copenhagen, to include tuberculin-testing and vaccination of all the tuberculin-negative aged 15–35 years.

DOSAGE OF CURARE

THERE are now on the market two preparations of curare for use in anæsthesia, one amorphous and one crystalline; both depend for their activity on *d*-tubocurarine chloride but they differ in potency, the amorphous preparation 'Intocostrin' having about a quarter of the activity of the pure crystalline material. This difference is a source of danger and might result in serious accidents. There is also some evidence of wide variations in individual reactions, depending to some extent on the patient's state of health. Thus in one otherwise healthy man with a recent perforated gastric ulcer as little as 5 mg. of the crystalline material produced adequate muscular relaxation, and 15 mg. would probably have been a considerable overdose. The anæsthetics committee,[1] jointly appointed by the Medical Research Council and the Royal Society of Medicine, are considering the standardisation of curare. Meanwhile they recommend that dosage should be based on the individual reaction to an initial small injection rather than on any dose/weight ratio. In the average healthy adult this initial dose could be 10–15 mg. of crystalline *d*-tubocurarine chloride or 40–60 mg. of intocostrin.

ADVERTISEMENT OF PROPRIETARY MEDICINES

LAST Monday the Hunterian Society met at Apothecaries' Hall, under the chairmanship of their president, Dr. J. B. Cook, to debate: That the Advertisement of Patent Medicines is a Menace to the Public. Mr. Hugh Linstead, M.P., speaking for the motion, admitted that the busy practitioner would be in difficulties if everyone had to come to a doctor for simple remedies. There had been great improvements in the materials and the advertisement of proprietary medicines since the Royal Commission of 1914. Nevertheless, much remained to be done. Advertisers obeyed the letter rather than the spirit of regulations; mention of "cure" was prohibited by newspapers, but "abolish," "kill," and other terms suggesting cure still appeared. There was still no control over postal advertising. There were too many worthless medicines on the market; prices were excessive; the disclosure demand was too often made the occasion for concealment; scientific terms were misused to mislead the ignorant; and advertisers played on fear. The Ministry of Health should shoulder the task of control as in Canada, where there was prohibition of the sale of proprietary medicines associated with claims for cure, or for which false, misleading, or exaggerated claims were advanced.

Dr. G. H. D. Day could not recall a single instance in which use of these medicines had delayed recourse to medical attention. The patent-medicine addict was the frustrated doctor-addict. These medicines did at least renew hope; and "an act of faith can alleviate symptoms, restore function, arrest disease, and promote healing." The sick man wanted a bit of magic. There existed in the patient a deep sense of the need for sacrifice. There was, too, an ineradicable impression that if the best was to be obtained it must be paid for. When the panel system came in the sale of patent medicines had soared; it would now again increase, because this was the only remaining altar on which to make a sacrifice. Notwithstanding all this, Dr. Day opposed their advertisem for this had an element of duality. In childhood, were projected on to the bogyman; now these to be transferred to halitosis and B.O. Patients willing to accept this as punishment for their feelings. "What have I done to deserve this?" often heard. Advertisements suggested that ill h was the common lot; and the sales depended o creation of ill health. The outrageous cost coul forgiven, for it offered a chance for expiatory sacri but the advertisements could not be forgiven, because increased the storehouse of anxiety and unhappines

Mr. Arthur Mortimer, a director of the Beecham G opposing the motion, admitted that a few proprie medicine manufacturers work under reprehensible c tions; the reputable section of the trade would li stop this. The difficulty in the control of advertisen was that the railways permitted advertisements w the newspapers refused. Any exaggeration was si "puff" by manufacturers justly proud of their pro And was it right to stop all advertisement because a exaggerated? So long as the proprietary-medicine t was rendering service—and there was nothing wrong most of it—it should be allowed to advertise. industry would welcome legislation on the lines acce by Canada if it was going to help.

Mr. J. S. Walmsley, secretary of the Proprie Association, insisted that proprietary-medicine advert was informative rather than persuasive. The valu advertising was in its results; no manufacturer c afford to advertise unless his product benefited patient. The advertisement of proprietary medi was more closely controlled than any other for advertising; and the quality of advertising had impr enormously since 1939.

In other speeches it was suggested that the pr conciliatory attitude of the trade is due to the m facturers having seen the red light. A large maj supported the motion.

MEALS AND THE ELECTROCARDIOGRAM

SURPRISINGLY little is known about the effects of on the electrocardiogram. Simonson and his colleag have now studied the findings in twelve healthy y adults before and after standard mixed meals and hig meals of 942–1548 calories. The significant chang the limb leads were an increase of heart-rate; an inc of K_{QT} (i.e., $\text{QT}/\sqrt{\text{R–R}}$); a decrease of the T w the Q–T interval, and the duration of mechanical sys and an increase of the amplitude of QRS. In the leads the T wave became more positive in CF_1, whi CF_2 and CF_4 it was decreased. Frequent but incons changes were noted in the P wave, while there was change in the P–R and QRS intervals, the Q wav the S–T segment. These changes were noted half an after the meal and were still present an hour after meal. The next question to be investigated is the e of a meal on the abnormal electrocardiogram.

TWO STAGES?

TUESDAY's *Times* contained a letter from Sir H Bashford, late medical adviser to the Treasury, sugges that the Government should postpone provisio general-practitioner services under the new Act until hospital services are working satisfactorily—in perl five years' time. "Meanwhile let general and p practice go on as before." From such a source proposal commands attention; but it would be idl ignore the public dissatisfaction it would cause, and difficulties it might create in administration of the insurance scheme and in resettlement of ex-Ser doctors.

---

[1] The committee consists of: Dr. C. F. Hadfield (chairman), Prof. F. H. Bentley, F.R.C.S., Dr. C. Langton Hewer, Mr. R. Vaughan Hudson, F.R.C.S., Mr. Harold King, D.SC., F.R.S., Prof. R. R. Macintosh, D.M., Mr. F. C. MacIntosh, PH.D., Dr. M. D. Nosworthy, and Dr. G. S. W. Organe (secretary).

[1] Simonson, E., Alexander, H., Henschel, A., Keys, A. A *Heart J.* 1946, 32, 202.

administrative agencies does not destroy the unity the health service as a whole; the patient has only to ow his need of assistance, and it is our privilege to give to him. Mr. Bevan believed we must have psychiatric ntres in our general hospitals, so that patients will ek help for mental illness as readily as they will for any ther kind. Aftercare and continued assistance are also sential, so that people get the right things to do in the ght sort of company. We have a social conscience owadays, and we must create a social machine to serve it.

The second day's discussions were largely concerned ith educational problems.

ROYAL COLLEGE OF SURGEONS

NATIONAL HEALTH SERVICE ACT

AT the annual meeting of fellows and members held on Nov. 13, Sir **ALFRED WEBB-JOHNSON**, the president, gave a brief address on the National Health Service Act. With regard to hospitals, he said, considerable concessions had been made: the State had taken over the hospitals, and a monopoly in hospital services was thus created, but concessions had been made in the direction of more freedom of control to the management. The provisions with regard to the appropriation of trust funds had also been modified to a considerable extent, and the funds would, as far as possible, be used solely for the benefit of the hospitals. Concerning specialist practice and the restrictions put upon doctors who were not in the public service, the college had fought for the principles expressed at its meetings. A confused and rather ill-informed debate on the matter had taken place in the House of Lords, and he read a correspondence which, following the debate, he had had with the Lord Chancellor. The Lord Chancellor had accepted an amendment designed to allay anxiety lest those specialists who did not join the public service might be debarred from treating their patients in hospitals privately.

Mr. C. F. **BEARE** felt that there was still ambiguity in the amendment which the Lord Chancellor had accepted. He moved, and Mr. **DICKSON WRIGHT** seconded, the following resolution:

> That this meeting of fellows and members of the Royal College of Surgeons urges the council to do its utmost to prevent the penalisation of private practice by the restriction of the medical staffs of hospitals to those who take part in the State Medical Service.

Dr. H. **GUY DAIN** said that, as far as he could see, if and when the State owned all the hospitals it would mean the end of private specialist practice. If they assented to the implementation of the Act in its present form they would immediately have to invite their private patients into newly established nursing-homes outside the Service, and even then the Act gave the Minister power to take over anything he liked, including, of course, such nursing-homes. Dr. Dain had feared for some time that consultants and specialists had not properly realised the implication of ownership of hospitals by the State.

The **PRESIDENT** said that the Lord Chancellor's assurance and the Minister's confirmation of it went some way to relieve anxiety. Members of the Negotiating Committee would, however, try to clear up the point that had been raised. They would continue to fight for the freedom of the profession.

The resolution was put to the meeting and 26 voted in its favour. Mr. **LAWRENCE ABEL** thereupon called attention to the fact that a quorum (30) was not secured and asked whether the President would consider calling a special meeting to discuss the matter. Mr. R. T. **PAYNE** supported this view and said that he was appalled at the attitude—or absence of attitude—of the hospitals.

The council has since decided that a special meeting of fellows shall be held on Nov. 29.

Buckston Browne Dinner

At the Buckston Browne dinner of fellows and members held at the college on Nov. 14, Sir Alexander Fleming, F.R.C.S., F.R.S., received the college's honorary gold medal, which has been awarded only 20 times in 144 years. Introducing the medallist, Sir **HENEAGE OGILVIE**, senior vice-president, said that Fleming's discovery of penicillin when his culture was contaminated by a mould was no more an accident than Newton's discovery of gravity when the apple dropped in his orchard.

The **PRESIDENT**, welcoming The Guests, described Mr. Bevan, who had lately paid a four hours' visit to the college, as a colleague with whom "we've got to get together and talk over these extraordinary activities of Parliament and see whether we can't make sense of them." The appeal for £250,000 for restoration and development of the college had so far, he said, produced £143,000, and wonderful opportunities lay ahead: in September the number of attendances at lectures already totalled over 9000. He was now able to announce the endowment by a New Zealand industrialist of a Commonwealth professorship of some £2000 a year enabling clinicians in the Dominions to come in contact with their colleagues in this country (see *Lancet*, Nov. 16, p. 737). This gift had been made to the College of Surgeons, but the donor wanted representatives of other bodies to help in appointing the fellows, who would generally be physicians, surgeons, or scientific workers resident in Great Britain, Australia, or New Zealand. The King had expressed his interest in the scheme, and the Prime Minister had described it as a munificent and far-sighted gesture showing "real appreciation of the needs of medicine, science, and the British Commonwealth."

Viscount **ADDISON**, F.R.C.S., Secretary of State for the Dominions, spoke of the need for exchange of high-ranking teachers between the Dominions and this country, and of the development of postgraduate study in London, which, he believed, had a finer set of teachers than any other city in the world.

Mr. **ANEURIN BEVAN**, Minister of Health, thought the New Zealand gift even more wonderful in its symbolism than in its content. In his visit to the college he had seen young men from very many countries "who had come to sit at the feet of our own teachers in London," and he felt that there was here an opportunity for something quite unique. The Government were exceedingly eager that postgraduate medical education should be developed, and would give every assistance in their power. In his period as Minister of Health "which is bound to be long and successful" he looked forward to a fertile association with the college.

Mr. W. J. **JORDAN**, High Commissioner for New Zealand, expressed his conception of Great Britain as "the centre of things," and Mr. J. A. **BEASLEY**, High Commissioner of Australia, touched on the various levels—sporting, political, scientific, medical—at which the people of the Commonwealth could learn to feel themselves part and parcel of one another, "tied together by something greater than can be written."

Mr. **THEODORE GODDARD**, as legal agent for the endowment of the new professorship, said that the donor's one object was closer contact within the Empire.

YES OR NO?

SOME PRESS REACTIONS

THE British Medical Association last week invited all registered medical practitioners to answer the question: "Do you desire the Negotiating Committee to enter into discussions with the Minister on the regulations authorised by the National Health Service Act?" The following are extracts from comments since published in the press:

British Medical Journal

What will be the position if the Negotiating Committee is instructed not to enter into discussions with the Minister on the Regulations and Orders of the National Health Service Act? The Minister, it is true, could proceed to make these Regulations and Orders with, presumably, the advice and assistance of the minority in favour of discussions. There can be no doubt, for example, that in this he would have the support of the Socialist Medical Association. He would, however, not have the indispensable support of the constituent bodies of the Negotiating Committee. The answer "No," backed by a substantial majority, would make the Act inoperable, and further legislation would be necessary to secure those principles the medical profession considers to be fundamental to its professional existence. But for the Negotiating Committee to be strongly armed in any conflict that might arise as a result of a negative answer the majority would independent effort, opportunities for settling domestic problems, for learning about social institutions, and for trying their hand at the kind of job they will eventually do. This technique has been used successfully in the resettlement of returned prisoners-of-war.

He described the case of a man on the disablement register whose difficulties had been recognised for $4^1/_2$ years, during which the Ministry of Labour had found him 46 jobs. He had taken up a great deal of the time of the Ministry, the local workers of the Provisional National Council, the disablement rehabilitation officer, and his doctors, but none of these experts in treatment, reablement, and employment had ever met together on his case. Industrial case-conferences are needed, and the Ministry of Labour might offer examination, and get a recommendation for action, from a team including the D.R.O., a social worker, a general practitioner, and a psychiatrist. Recommendations for jobs should be matched to known opportunities, and associated with a system of settlement operating not only in reablement centres but in industry.

Mr. R. E. Goll (Ministry of Labour) said that the mentally handicapped form 20 % of all types of disablement needing help; this figure is probably too low, however, for people are not ready to come forward with this type of disability. The Ministry are trying to get better ascertainment with the help of social workers. He noted that, on the advice of doctors, reablement centres are not taking psychiatric patients unless their disorders are mild; but the Ministry hopes to take over some of the civil resettlement units from the Army, as well as some of their staff to develop them. Sheltered factories, under the Disabled Persons Corporation, will take the more severely disabled, a large proportion of whom, it is hoped, will be refitted for industry. One of the difficulties at the Ministry has been due to the interpretation by lay staff of written medical reports; it is now hoped to set up a medical interviewing service, and also a diagnostic centre where patients can be observed for a time and assessed.

In the subsequent discussion a social worker said that of 4000 mentally handicapped patients in Birmingham over 60 % are employed, including many of low grade. There are plenty of routine jobs for them in the factories of the city, and an aftercare system has been active since 1901; but even so, much work is needed to get these good results. Subnormal people are easily put off, and every grievance has to be investigated at once.

Community Care

At the afternoon session Mr. P. Barter (Board of Control) took the chair, and Prof. Aubrey Lewis opened a discussion on community care in relation to the extended powers of health authorities under the National Health Service. He regretted that the authority responsible for community care will usually be different from that responsible for hospitals and clinics, but hoped that the same doctors, psychologists, and mental-health workers as are employed by the regional authorities may also be able in some cases to work for the local authority on a part-time basis, so ensuring continuity of personal care for the patient. He referred to Dr. C. P. Blacker's report, *Neurosis and the Mental Health Services*, as the vade-mecum of those who execute, and the bible of those who plan, the mental-health services. The National Health Service Act provides the means whereby his recommendations could be made actual, provided enough people of the right kind can be found to work in it. Children will demand much attention, but the elderly will soon make up the bulk of people needing psychiatric care, and their demands may drain time and effort which might otherwise be spent on younger people—a dangerous situation. Psychiatric outpatient departments must be more numerous, flexible, and generously staffed, and must concern themselves more with following up, and with the use of social resources. The psychiatrist, the general practitioner, the psychologist, the psychiatric social worker, the nurse, the health visitor, and the personal manager or welfare officer all have their place in the care of the mentally ill.

Professor Lewis believes that boarding out of patients might be used much more freely in the care of mentally ill patients: it is practised successfully in France,
Germany, Scandinavia, Switzerland, and the Un
States. He quoted the finding of Miss Crutcher
success depends on the amount of time given to the
of these patients by psychiatric social workers. In
long run it offers an economy in the cost of mental
vices, and—more important—means for many incur
patients an increase in happiness.

During the last twelve months some 5500 patients h
been referred by civilian agencies to the aftercare ser
offered by the Provisional National Council—a strik
illustration of the need for a national mental-he
service. But there must be economical use of
present resources in trained people: the social work
of each region should be attached to the mental-he
services of that region, and the activities of the
visional National Council should be a part of the hea
service rather than a separate social service or a
of the social services provided by the local author
Four factors set limits to what we may hope to achie
(1) the number of trained people available; (2) the st
of public opinion and knowledge about mental heal
(3) the state of expert opinion and knowledge;
(4) the intimate dependence of mental health upon
social fabric. In view of the general shortage of m
power, Professor Lewis thinks economical use of
people already in the field, and better training of th
now entering it, will provide the necessary staff bet
than competitive efforts to attract more young men
women into these careers.

Dr. W. S. Maclay (Board of Control) suggested t
the various authorities in a region should collabor
and use each other's officers. He hoped the officers
take over the duties of the relieving officers will m
use of specialists in the home whenever their help
desirable. He mentioned that transfer to hospital
be frightening for the patient: care on the journey
not always satisfactory. The patient should be atten
by trained nurses from the hospital to which he is go
In order to prevent confusion in the use of psychiat
social workers, he suggested that the patient should
under the care of the hospital social worker as long
he is attending outpatients, and should be transfer
to the local-authority social worker only when he
longer needs the help of the hospital.

Dr. Thomas Beaton (St. James Hospital, Portsmou
said that in his city the mental-health service covers
whole field, and he was nervous lest the new Act sho
separate the community service from the hosp
service. Dr. Doris Odlum thought the local authori
have a special opportunity in the field of preventi
and since early diagnosis means better results she wo
like local authorities to set up adequate outpati
clinics, staffed by psychiatrists and social worke
Mr. Bainbridge thought ascertainment is bet
achieved through the local health authority than throu
hospitals. Dr. E. Cunningham Dax (Netherne H
pital) had some concrete plans for the elderly.
had analysed the histories of 250 patients over six
and had found that 80 % either die or are discharg
within six months of admission to hospital. He suggest
that hospitals offering six months' care might be provid
for patients over sixty; while something more like
home-from-home might be provided for the 20 % w
still need care at the end of that time.

THE MINISTER'S VIEW

Mr. Aneurin Bevan, Minister of Health, said that t
duty of the Ministry has been to put at the disposal
mental-health workers the best possible administrati
apparatus, and to leave them to use it. Some feared th
the Minister would impose his "almost illimitat
ignorance" on the technical workers in their speci
fields, but it was not his business to dictate how th
should use their special knowledge—only to put the be
kind of facilities at their disposal. The new schem
should extend, not reduce, voluntary activities.
reminded the meeting that ours will be the first nati
to remove financial anxiety from between doctor a
patient—and a financial anxiety neurosis is as bad
any other. The different organisations under the heal
scheme will be coördinated by the fact that the M.O.
the general practitioner, and the specialist will all
common users of the same facilities: and access
those facilities cannot be denied to any citizen. A variet

In England Now

A Running Commentary by Peripatetic Correspondents

QUITE a short residence in South Africa immunises me against surprise at anything the medical profession may say or do. Consequently the announcement of he South African Medical Council, as reported in the morning paper today, that articles in the medical press must be unsigned hardly interfered at all with the downward progress of one's breakfast egg. One merely wondered whether it was going far enough—the S.A.M.C., I mean, not the egg. Should we not walk around masked, be better to preserve our anonymity? No, perhaps not, for I have never noticed any eclipse of a surgeon's personality by his cap and mask—rather the contrary.

With my experience of unit censorship I'm just the man for the job of rendering anonymous the textbooks in the library. And what fun I should have with that book on surgery by X and Y. Mr. Y, who called me rude names in my Conjoint surgery—and I failed—will be radically excised with the scissors. Mr. X, whom I met later in the M.B. viva, was charming throughout and gave me a pass mark. His name shall receive merely a token stroke with the blue pencil.

* * *

Last night the medical superintendent of one of the Chinese hospitals came to my rooms and said: "This is the day the managers hold their quarterly meeting. There's a feast for the staff afterwards. Why not come along?" I gladly went. "Don't," he advised, as we neared the place, "eat much of the first few courses. If you do, you'll never get through the meal. Well, here we are. This is the nurses' dining-room."

Some fifty girls and a dozen men rose to their feet at our entrance and looked towards me in respectful silence. I began to feel a little like a god. My host introduced me in Chinese. I don't know what he said, but everyone suddenly burst out laughing and bowed me in with enormous grins. I stopped feeling like a god and sat down on a couch next to a rather pretty nurse. I opened my mouth to frame a halting Cantonese "Hallo," but a waitress smartly plugged the gap with a cigarette. Another lit it, a third handed me a glass, a fourth half filled it with whisky, and a fifth added a grudging hint of water. "There!" said the rather pretty nurse. "Now you're all right." Thenceforth we discussed each other happily in English.

Ninety minutes later I stood up just the least bit deliberately in response to a general move towards the food. By this time the rather pretty nurse had become quite beautiful; so had the other forty-nine; and the men appeared as bold Apollos set in a field of lovely Daphnes. The meal was served at small round tables, and the Daphnes, as Daphnes always will. tended to bunch into strong, protective groups. Five minutes' good clean fun was had by all while the bold Apollos sorted the Daphnes out. I kept close tag on the rather pretty nurse, for she, dear girl, had promised to help me wield the chopsticks. How would the matron of my own grave hospital have borne the sight of her carefully cultured chicks dodging in squeaking ecstasy round the furniture, hotly pursued by the board of management?

And goodness, how those girls did eat! Shrimps and oysters, bamboo shoots and pineapples, all mixed up into one glorious dish; fried rice and nuts and mushrooms; shark's fin soup; boiled chicken; plovers' eggs; roast duck (the duck was cooked to a limp rag—we only used the gravy); boiled frogs (tasting like rabbit); fried fish; fat pork (soft as a jelly-fish); fried prawns; pêche Melba; and green tea. As each enormous dish was placed on the table out shot a baby forest of chopsticks, and in a matter of seconds the platter was empty, every scrap transferred to the bowls from which we ate each course in turn. I had the special protection of a waitress who did the preliminary forage work for me. Had my Daphne done this she would never have salvaged a morsel for herself. Not till the centre dish was empty could she afford to rest and guide my awkward sticks.

Meanwhile the managers were hard at work. After the first keen appetite was dulled they started on the healths. These were intensely personal affairs. A man would charge his glass, pin-point his victim, run up to him, and loudly shout the toast. Then it was "bottoms up" without the option. I, as the only stranger there, came in for more than my fair share of bottoms up. I strove to uphold British honour and prestige by keeping a glass of water tinged with soya sauce at hand, ready for instant draining.

At length the feast, starting in busy silence, rising to noisy merriment, sank to a stage of sleepy satisfaction. Two or three managers arose and bade farewell. They had a business dinner to attend elsewhere. One of the housemen went to the piano. "Now," thought I, "some Chinese music; just to round things off." First he played "Onward Christian Soldiers," then "Abide with Me." All sang. A few more hymns, until, in deference to popular demand, this Oriental evening closed to the strange sound of over fifty Eastern voices chanting with sentimental joy: "My Little Grey Home in the West."

* * *

The Hetherington report on domestics, the Rushcliffe report on nurses and midwives, the Spens report on medical practitioners, the Askwith report on public-health medical officers, and the National Joint Council agreements on various staffs are playing pranks in local-government circles. Maids often get more than assistant nurses; the intake of student nurses is falling because girls can make more, and think they have a better time, working in shop or office where their leisure is not tampered with; and various medical auxiliaries regard each other with some asperity because there is a £10 difference between their basic salaries.

The poor old Askwith horse, however, has already more jockeys than it was ever meant to carry. Designed for medical officers in the health service, the scales are already being adopted by other local-authority officers as levers to salary promotion. Why, it is argued, should the medical officer of health have more than the gas engineer or the treasurer—so up goes the salary of these officials. Why, says the town clerk, should the deputy town clerk have less than an assistant medical officer of health—so up goes the deputy town clerk's salary. It all seems very illogical, but there it is.

So now, in these days of the closed shop, and feeling somewhat insecure as a medical officer of health, I am thinking of joining the County Clerks' Trade Union, or, better still, that of the Chief Electrical Engineers, just to see if I too can bestride an alien nag and ride home to win £3000 a year.

* * *

It is one A.M. again, and I am facing what always seems to me one of the worst half-hours in the G.P.'s life. Twenty minutes ago, bathed, relaxed, and rejoicing in my newly donned winter woollies, I was at peace. Nineteen minutes ago I was listening to an anxious voice saying, "The wife's hot and cold all over, doctor. Can you come at once? I think it is serious." Long experience has taught me that when such a summons comes to obey is the lesser of two evils. If I don't go I spend the rest of the night either reproaching myself for my unkindness or visualising the patient dying of some obscure complaint which I alone could cure. If I go my conscience lets me alone. But having gone, why is it so difficult to make an unbiased diagnosis at midnight? The patient is dyspnœic. She says she is in agony and can't speak. The pulse is rapid but of good volume. It looks like the old story of "wind with wind up," but I can't be sure. However, I prescribe bicarbonate, sugar, and water and retire downstairs to drink a cup of tea with the husband, who miraculously seems to have forgotten his worries and starts to tell me about his new job on the railway. To a layman and to a better doctor the thing would be finished and forgotten. But it is not like that with me. Back in bed the darkened room seems to clear the mind and call up forgotten diagnoses. I recall a case where, having reassured the relations and told them there was no cause for worry, I was accosted next morning by those selfsame relations. "Can we have the certificate, doctor? We want to get the funeral over before the weekend." In my mind's eye I see our coroner no longer his usual kindly self but full of scathing comments on the folly of spot diagnoses at midnight.

But time marches on. It is now one thirty and the husband has not phoned again. My medicine must have worked. The patient is asleep and will not die tonight and perhaps now the half-hour is over I too may be permitted a little rest.

have to be substantial and firm in its purpose. It is, of course, obvious that if the medical profession was so set against the Act that it felt unable to work under it such a decision would in no sense be illegal or in the nature of a strike. Doctors do not strike. They will always continue to serve the sick public. An Act is not necessary to make them do this. It would simply mean that they would not serve the sick public within the framework desired by the Government of this country. The Minister fully recognises the right of the individual medical man not to enter the Service, so a decision not to enter into it would be strictly legal and honourable.

DR. GUY DAIN (*chairman of council, B.M.A.*)

We have just learned that a strong and concerted action will force the Minister to do something which he was entirely unwilling to do. The threat—it was no more than the whisper of a threat—that insurance practitioners would resign if he would not agree to implement the Spens Report brought him to heel at once. Here we have an opportunity of saying that we will not take any part in a service that does not concede our principles. Why should we not get our principles accepted as well as the conditions of service ? The conditions will have to be argued afterwards anyhow. Why not insist on our principles being established, by an amending Act or whatever it may be, before we agree for a moment to talk on terms and conditions ? We should be no worse off ; indeed we should be infinitely stronger in talking about terms and conditions if we had first by our own efforts secured the acceptance of our principles. . . .

We want to put into the Act the right of every doctor to come in, and the right of appeal to the courts from the Minister's decision to take us out of the service ; we want removed from the Act the State ownership of hospitals, the embargo on the buying and selling of practices, all direction of general practitioners, and the salary element in general practitioners' remuneration ; we want altered the procedure of election on to the councils and committees so that we may nominate our own representatives instead of the Minister choosing them all, and in that way we may curb dictatorship in the service. (*Brit. med. J.* Nov. 16, p. 747.)

MR. HENRY SOUTTAR (*late president, B.M.A.*)

To me it is intensely disappointing that the association should now refuse to assist in the completion of a project to which they themselves gave birth, the great conception of a universal medical service for the whole nation, and it is of grave import that they should resist the implementation of what is now the law of the country. If they persist in their refusal it only means that they will have no share in the control of a great enterprise, for I am certain that the medical profession will never refuse to serve the nation. The points at issue are of secondary importance, upon many of them there is no general agreement, and they furnish no possible justification for the statement that the liberty of medicine is at stake. I trust that doctors throughout the country will refuse to be led into an untenable situation which could only bring discredit upon us all. (*Times*, Nov. 19.)

Medical Press

What would be the effect of the decision " no " ? This, of course, is primarily a matter for a Constitutional lawyer, and it is a field into which we would not presume to enter. But in the mind of the ordinary man or woman it would surely be tantamount to a decision not to coöperate with the Minister in the working of the new Bill, which again would be tantamount to a refusal to accept the decision of Parliament. In our view, for what it is worth, to vote against negotiations would be a very perilous course for the profession to take. . . .

Technically, perhaps, as the *British Medical Journal* emphasised in its Editorial of November 16, it would not be a strike. " Doctors do not strike. They will always continue to serve the sick public. An Act is not necessary to make them do this. It would simply mean that they would not serve the sick public within the framework desired by the Government of this country."

But if not, as we have said, technically a strike, such action would so very closely approximate to a strike that it might be hard to detect *the difference*, and we would certainly not expect the general public to make such a delicate differential diagnosis. It would almost certainly be construed as a defiance of Parliament, and it might well initiate a struggle in which no support from *any* responsible political quarter could be expected. (Nov. 20.)

The Times

With the ballot form sent to each doctor are enclosed
comments on the Act of the joint committee of the me
organizations which has been *negotiating* with the Gov
ment. This disappointing and somewhat partial docu
has nothing to say in praise of an epoch-making me
beyond a grudging acknowledgment that " the constru
proposals of the profession are reflected in certain sec
of the Act." It contains no appreciation of the
substantial concessions to the interests of doctors w
Mr. BEVAN either took over from Mr. WILLINK or later i
duced or of the difficulties of carrying compromise any far
The Act is assailed for its wide divergence from
" principles " laid down by the negotiating committee, wit
any awareness that this set of aphorisms and demands
part rejected by a great many who are not Socialists and
no desire to " nationalize " medicine. . . .

The Act is not perfect, but its *main principles* have
approval of the public, whose *interest in the medical ser*
is greater even than that of the doctors. It offers un
cedented opportunities for doctors, indeed for all he
workers, to participate directly in the planning and man
ment of their own service. A refusal to use those opportun
would exasperate public opinion, arouse the anger of t
supporters of the Government in Parliament who are by
means happy about some of Mr. BEVAN's concessions
professional interest, and might force the Government
local authorities to make the attempt of introducing a sala
service at least in some areas. The conflict in which
B.M.A. engaged the Government in 1911 and 1912 sti
up much ill-feeling against the doctors, even though the B.
then fought with greater justification and on stronger gro
Dr. DAIN remarked at Exeter the other day that " thos
us who have been in national health insurance practice
been quite unconscious of any restriction on our freedo
This was not the language of 1912, when the health insur
scheme was about to be launched and the medical profes
stood, as now, on the threshold of great changes. Is it
conceivable that in the future the leaders of the med
profession will be speaking of the Act of 1946 as Dr.
now speaks of the Act of 1911 ? (Nov. 15.)

Evening Standard

Certainly the National Health Service Act is open
question in individual details. Certainly there are dan
to be sedulously guarded against, of clogging medicine
the bureaucratic apparatus of departmental control.
the broad *principles* on which the Service is to be b
command general assent and are for the general wel
Moreover, the measure has now become law, enacted by
elected legislature of the British people. The supremac
Parliament is not open to the challenge of the doctors.
Effective government in a democratic country must be enti
dependent on the loyalty with which the minority carry
the decisions of the majority. The B.M.A.'s leaders have
ample opportunity to state their case. . . . Now they sh
have the honesty to acknowledge that the fight is over.
persisting in stubborn faction they will forfeit the symp
and respect of the people. (Nov. 16.)

INFECTIOUS DISEASE IN ENGLAND AND WA

WEEK ENDED NOV. 9

Notifications.—Smallpox, 0 ; scarlet fever, 13
whooping-cough, 1590 ; diphtheria, 314 ; paratyph
30 ; typhoid, 5 ; measles (excluding rubella), 39
pneumonia (primary or influenzal), 601 ; cerebrosp
fever, 46 ; poliomyelitis, 21 ; polioencephalitis,
encephalitis lethargica, 2 ; dysentery, 65 ; puerp
pyrexia, 125 ; ophthalmia neonatorum, 57. No case
cholera, plague, or typhus was notified during the we

Deaths.—In 126 great towns there were no dea
from measles, 1 (0) from an enteric fever, 2 (0) from sca
fever, 8 (0) from whooping-cough, 2 (0) from diphthe
57 (5) from diarrhœa and enteritis under two years,
16 (2) from influenza. The figures in parentheses
those for London itself.

Grimsby reported the fatal case of an *enteric fever. There*
9 deaths from diarrhœa and enteritis at Liverpool.

The number of stillbirths notified during the week
262 (corresponding to a rate of 26 per thousand to
births), including 26 in London.

rsing and hold precisely the same academic rank as their w deans in other faculties. At Vanderbilt the school of ing is one of the seven independent schools of the univer- with its dean at its head. It has its own financial resources makes its own annual budget. Since 1935 all costs and onsibilities relating to nursing education and nursing ice have been separate. A director of nursing services urse) is in charge of the hospital nursing service, and each d unit has a head nurse in charge. The superintendent of hospital (a medical man) is responsible to the dean of medical faculty, and the director of nursing services is onsible to him.

he school of nursing employs a full-time staff of clinical ructors (nurses), who are members of the faculty, not of hospital staff, and also utilises the services of the professors lecturers of the faculties of medicine and science (for ch it pays). The dean estimates the exact number of rs of clinical experience in all nursing and public-health ds that she requires for her students and requisitions se from the services concerned. The director of nursing vices, on her side, knows how much clinical assistance can expect from the students, and plans staffing cordingly.

The hospital provides maintenance (room, board, and ndry) for the students at a hall of residence in return for eir clinical work in the wards, and to cover the "freshman" riod of ten months while students do not enter the wards school pays the hospital a "blanket" sum for freshmen's aintenance. Students of nursing mix with students in other ulties (*Amer. J. Nursing*, 1946, 46, 550).

Mrs. Bennett came back greatly impressed by and vious of what she had seen but convinced that Britain ust work out its nursing problems on its own lines. either do I suggest that we want uncritically to import merican and Canadian methods. But we do contend at unless and until the "profession" of nursing to hich so many people pay lip service has its own faculty ith an intellectual discipline as satisfying and as xacting as that of other faculties it is not in truth a rofession.

Moreover, I believe that if a university school of nursing ould be started on experimental lines it would imme- ately attract students of the quality required, who ould have the courage and the imagination and initiative o realise that their concern would be to break away from tradition if necessary, and not to rest until the needs of all patients—acute and chronic, the young and the old—for nursing service and for health education were fully met. Believing this I cannot think that a "medical dean of nursing" would be an advantage to us. To quote Emily Davies in the pioneering days of the omen's colleges: "We are really obliged to Convocation or their kind intentions in offering us a serpent when e asked for a fish, though we cannot pretend to believe that serpents are better for us."

London, W.2. G. B. CARTER.

MALIGNANT GRANULOMA OF NOSE

SIR,—Mr. Hargrove and his colleagues (Oct. 26, p. 596) state that the cause of this condition is unknown. I think it may be linked up with cutaneous gangrene.[1] There has also been an interesting paper on bony changes associated with tropical ulcer.[2]

It is significant, I think, that Mr. Hargrove's case responded to penicillin, since this has been found effective by others.[3,4] Even more significant is the account from the Mayo Clinic of spreading osteomyelitis of the cranial bone.[5] The work was based on the report by Williams and Heilman[6] that a micro-aerophilic short-chained streptococcus is responsible for the malignant type of osteomyelitis; the Mayo Clinic workers found this organism sensitive to penicillin. Meleney recommended a special active preparation of zinc peroxide, while I have found powdered potassium permanganate effective.[1]

St. Margaret's Hospital, Epping, Essex. FRANK MARSH.

TUBERCLE BACILLI IN CEREBROSPINAL FLUID

SIR,—In your report (Oct. 12, p. 528) of the September meeting of the Tuberculosis Association, Dr. Honor Smith is reported as saying, "unfortunately, tubercle bacilli could seldom be found in the cerebrospinal fluid" (in cases of tuberculous meningitis). I must dissent from this view. Examining fluids in our own laboratory, we have not failed, for several years past, to demonstrate the tubercle bacillus in every case of tuberculous meningitis coming under our care. Nearly always the first (and only) specimen drawn by lumbar puncture yields the organism; rarely, examination of a subsequent specimen is required. I would indeed go so far as to say that the bacillus may *almost invariably* be found before death in the cerebrospinal fluid from a case of tuberculous meningitis, provided only that the searcher is both adept and persevering. NIGEL W. ROBERTS.

Hull City Isolation Hospital, Cottingham.

EXCISION OF THE HEAD OF THE PANCREAS

SIR,—In your admirable editorial on excision of the head of the pancreas (*Lancet*, Sept. 14, p. 380) the present position is concisely set out.

Whipple has clearly shown the advantages of the one-stage operation and has enumerated the objections to using the gall-bladder for the relief of biliary obstruction. The main steps in the operation, as outlined in recent excellent papers by Whipple and Pannett, are: (1) relief of biliary obstruction; (2) diversion of gastric emptying from the duodenum to the jejunum; and (3) division and removal of duodenum and head of pancreas, with anastomosis of residual pancreas to jejunum. These steps should be taken in this order. In discussing the first step you refer to the use of the gall-bladder for this purpose as "an unavoidable expedient in the two-stage operation." May I be permitted to disagree, and to suggest that it is possible to join the common bile-duct to the jejunum without increasing the difficulty of the subsequent steps? Moreover, while it would appear foolish always to adhere rigidly to a one-stage operation, yet the patient might well be able to stand more than mere relief of the obstructive jaundice at the first stage. The deciding factor must always be the patient's general condition and how well he will stand up to the anæsthetic and operation. This cannot be accurately forecast in every case, so one should be guided in deciding how much to do by the progress of the operation. It may often be possible to carry out the first two steps (described above) at the first operation, thus helping to equalise the two stages.

If a long jejunal loop is turned up through the transverse mesocolon, the divided common bile-duct can first of all be anastomosed to it. The distal end of the bile-duct, divided low down behind the duodenum, is securely closed with interrupted silk sutures. Then, if the patient is faring well, the stomach is divided through the pyloric antrum, the distal end closed with silk sutures, and the proximal end united to the jejunal loop well beyond the biliary anastomosis. If the patient is still doing well, the third and biggest step may be attempted. This needs careful consideration and fine judgment since, once begun, it must be completed.

These remarks are based on recent experience in operating on a man, aged 70, with very severe obstructive jaundice due to carcinoma of the head of the pancreas proper. After careful preoperative investigation and preparation, his abdomen was explored with the intention of performing as much as possible at the first stage, should two stages be necessary. The procedure described above was followed, but it was thought wise to stop at the end of the second step. This left room for anastomosis of the residual pancreas to the jejunal loop between the biliary and gastric junctions at the next stage. Unfortunately there was a delay of over two months before this next stage could be attempted, owing to threatened strangulation of a large right inguinal hernia, and an operation for a strangulated left femoral hernia, followed by uræmia due to retention of urine. Despite this delay, no undue difficulty arose from the steps of the first operation; but considerable difficulty was caused by adhesions, fat, and friable veins, especially

---

1. Marsh, F. *Lancet*, 1945, i, 739.
2. Brocklebank, J. A. *Brit. J. Radiol.* 1943, 16, 221.
3. Leacock, A. *Brit. med. J.* 1945, ii, 705.
4. Grimshaw, C., Stent, L. *Lancet*, 1945, i, 434.
5. *Proc. Mayo Clin.* 1944, 19, 480.
6. Williams, H. L., Heilman, F. R. *Arch. Otolaryng., Chicago*, 1937, 25, 196.

Letters to the Editor

THE TEACHER'S INCOME

SIR,—Lord Beveridge has put on record [1] his opinion that the medical profession should be paid more than the university teaching profession because the medical profession has to work harder at less regular hours and must deal with a proportion of unattractive patients.

Both of us who sign this letter have had experience of the university teaching profession and we feel that Lord Beveridge's statement calls for some discussion. How much more would Lord Beveridge pay the medical profession than the university teaching profession? A reasonable case can indeed be presented in favour of compensating for disturbed nights and disagreeable patients—although, among medical university teachers, pathologists and bacteriologists might claim that their work was often physically disagreeable and sometimes dangerous. But, on the whole, university medical teachers would not seriously object if their clinical colleagues were paid something extra for disturbed nights.

But in calculating the difference, account must be taken of demands on the "leisure" hours of university teachers that are made by carefully studied, often complicated, experiments and extensive scientific reading—both essential activities for a teacher who means to serve his students faithfully and make any progress in his profession. What must be avoided is perpetuation of the economic gulf which now divides university teachers from their clinical colleagues—with whom, in our teaching hospitals, they work daily on equal terms, sharing responsibility and contributing at least as much to the care of the sick.

In the past, university teachers have philosophically accepted that professors alone could hope to reach an income which was only slightly less than that of a moderately successful general practitioner and perhaps about one-fifth of that earned by a successful consultant in the same hospital. This unfair distinction was the outcome of blind economic force, and it was not their habit to be distracted by the chaotic values of the market-place.

But we stand now in face of a planned medical service, and the university teachers may feel less philosophic if Lord Beveridge and the planners decide to perpetuate the financial penalty upon academic workers. The market-place may please itself, but it will not do for the State to set a comparatively low value on the services of those who are to train its doctors, serve its great hospitals, and lead its medical thinking and research. Lord Beveridge may be right in asking for some difference in favour of clinicians, but the difference must not be of the order that now divides lecturers and professors from practitioners and consultants, or it will have a serious bearing on the quality of graduate who may be attracted to teaching and research when practice (in and out of hospital) becomes decommercialised and therefore more likely to attract men of academic outlook.

Aberdeen. JAMES W. HOWIE.
Leeds. GEORGIANA M. BONSER.

CORONARY DISEASE

SIR,—In your number of Nov. 9 Professor Ryle suggests that the incidence of coronary disease is some $3^{1}/_{2}$ times greater amongst professional men than amongst so-called working-class men. Observations made in the Post Office a few years ago are fully in accordance with this. But when, in discussing its ætiology, he states that "the amount of mental work and emotional stimulation now possible in the course of a single day is something far in excess of anything experienced by our ancestors," and that this may be an ætiological explanation, I would venture to express a doubt.

Here he appears to associate himself, in respect of coronary disease, with many others who assert that there is an increase in neurosis and nervous instability and that this is due to the increased "pace and pressure" of modern existence. But in respect of both these assertions it is surely not possible to make any accurate comparisons. The data do not exist. Yet, as regards alleged increase of nervous disorders, any even cas reading of seventeenth- and eighteenth-century nov diaries, and correspondence suggests that vapours, swo ings, and a liability to dissolve into tears were as comn then amongst young women and men—and indeed v possibly commoner. And amongst rural and other po lations that did not keep diaries or write letters or written about, was there not—on existing evidence— least as much anxiety and obsessional and other neuro due to beliefs in witchcraft, the evil eye, and a flam hell after death—to say nothing of the fear of physi violence, hunger, and a savage penal code?

Did not the Elizabethan day, whether in court country, navy or counting-house, contain at least many stimuli to mental activity and emotion as toda Is life in London now, for all its "pace and pressur fuller of malign influences upon body and mind th the London of Hogarth's Gin Lane or the London Pepys? If motor-buses travel at 30 miles an hour our suburban lanes, it is at least through lanes that free from highwaymen. If the wireless fills the coun cottage all the evening, it is at least to that extent oust ignorant gossip or the solitary brooding begotten of lo superstition. And has this alleged increase in "p and pressure" of modern life imposed upon the hum nervous system anything comparable with the burden th anæsthesia, for example, has lifted?

London. H. H. BASHFORD.

NURSING

SIR,—Discussion of the nursing problem is apt obscure the fact that at least three aspects requ consideration: (1) the needs of the patient; (2) natio allocation of man-power; (3) the nature of the wo to be done by nurses and their suitability and traini to do it.

In my judgment, (1) should be thrashed out in each of t regions of the National Health Service, by mixed committe representing everyone concerned—patients and the heal team (i.e., doctors, nurses, domestic workers, dietitia almoners, physiotherapists, occupational therapists, tec nicians). A directive and terms of reference might profitab come from the Ministry of Health to keep discussion with bounds. There might result surprising repercussions staffing. The second aspect would require man-power budge from each profession and trade making demands on t national man-power pool. Claims would have to be reconcil and dovetailed by the Ministry of Labour and Natio Service and should lead in every field to much-needed resear on optimum use of man-power, methods of education, a adjuvants to labour. The third aspect will obviously modified by the results of (1) and (2) but it seems certa that most recruits to the "nursing services," as defined, w eventually consist of carefully selected women (and so men) of the right temperament and of moderate education attainments, with a percentage of able women, and perha men, who must become highly qualified to teach, organi and direct the service as a whole.

For many years hospitals have aimed at recruiti near-matriculated and matriculated girls as probationer A high proportion of these entrants leave the nursi services, and the best of those who remain feel frustrate because their status is permanently inferior to the oth matriculated students who become doctors, teacher almoners, secretaries, &c. The reason is partly that the training and preparation actually are inferior in content, you point out, to other professional disciplines, and partl that the medical profession, except a minority, hav never been prepared to accept nurses as colleagues.

The stimulus to these remarks is the suggestion i your issue of Oct. 26 of a "medical dean of nursing who should "feel himself or herself to *be as muc responsible for the proper training of the nurses as the dea of the medical school is for his students.*"

It has been my good fortune lately to meet severa deans of nursing schools—all nurses—in the flesh. have also had much information from Mrs. B. A. Bennett chief nursing officer of the Ministry of Labour an National Service, recently back from an extensive tou in the United States of America and Canada.

At Vanderbilt, Yale, Toronto, and several other universit centres there are deans of nursing schools who are professor

---

[1] *Hansard*, Oct. 9, par. 94; see *Lancet*, Oct. 26, p. 596.

Dr. Frank found that after a certain number of convulsions patients reached a plateau level of over-politeness, or in English they were well cowed; and I suppose it could be argued that therapeutic terrorism and scientific bullying are justified by their results: but to call the process an altering of "faulty electrical patterns in the brain" is silly. If these words have some occult meaning which space did not allow him to impart, then I shall apologise to Dr. Milligan. Meanwhile, perhaps you will allow me to copy him in recording my belief that the page in the history of our mental hospitals which is being written now will present a pattern of considerable avidity.

Beckley, Rye. C. G. LEAROYD.

THE REGIONAL BOARDS

SIR,—The letter from Sir Leonard Parsons last week is extremely opportune. It is based on great experience and is entirely helpful.

Since the population of regions may run to 3 million, boards will be quite unable to manage the day-to-day affairs of district and smaller hospitals, and, in view of their extensive commitments, it is pretty certain they will avail themselves of the help of the great body of experienced people now engaged in settling the current affairs of those hospitals.

It seems to me the boards must be mainly "administrative"; but does that preclude their preoccupation "with broad lines of policy"? If rightly chosen it may well be an enlightened and imaginative administration. If we judge by the success of the great boards and "authorities" of recent creation, controlling activities in other spheres, it looks as though democracy was beginning to appreciate the importance of leaving supreme control to those with a lifetime's experience of the actual working of an undertaking and giving them a free hand to choose their own administrators. As we well know, only those who *do* the work understand its complications and requirements. It is for them to tell the administrators *what* they should provide, and explain how *not* to do it. The administrators will find the right way to do it. Experience of hospital boards shows that proposals from a medical committee for improvement of service to the public or for the betterment of patients, based on informed opinion and lucidly presented, are very rarely rejected by a lay committee. If not at once accepted on some ground of general policy or finance, even then they are merely postponed until conditions can be created in which they may be implemented.

It is then of the greatest importance that action should be initiated by professional counsel. As Sir Leonard says, it will be for the administration, and its executive officers, to find the best way of attaining the end desired.

Medical advisory committees should be constituted, if not before, at least simultaneously with the boards. In several regions temporary bodies serving just that purpose already exist. They have done a great deal of admirable work, much of which can be studied in published reports but should be more widely known.

In addition, many of the specialist associations have devoted a lot of time and thought to the preparation of plans for regional services, and fortunately some of the plans are based on experience derived from successful working of such schemes under the Emergency Medical Service. That service had far less power and fewer resources than will be at the disposal of the boards.

When boards first sit all this information will be available for their guidance, but much more on the same lines could be done to simplify their task. There are, for example, places where forward-looking people have considered in detail what will be the duties of a local management committee in regard to a group of hospitals. Is it not highly probable that a board will thankfully accept, at least in broad outline, plans so prepared? Ought not the same sort of activity to be initiated everywhere? Will it not be the fault of the profession—medical, dental, nursing, social service—if a newly constituted board has to begin by gathering with great expenditure of time and trouble information and advice that ought to have been prepared by us in advance?

With regard to the choice of officials it is to be hoped that no one pattern will be adopted for all regions. No-one yet knows what is the best plan. Nothing but good can come from diversity of method in the early stages. Who knows for certain whether the chief administrative officer should be a layman or a medical man? Why not try both plans if the right individuals can be found?

London, W.1. E. ROCK CARLING.

Medicine and the Law

No Fee, No Damages

A RECENT decision in the Dublin courts may have surprised those who study the liabilities of hospitals. Daniel Walsh went to the Cork District Hospital to be operated upon for varicose veins. He complained that some of the anæsthetic was somehow allowed to enter his eye. The judge found that the patient went into the hospital with two good eyes in September and was discharged in January with the sight of the left eye gone. Walsh sued the South Cork board of assistance. The board denied negligence and further pleaded that they owed him no duty. The judge held that, as Walsh was a non-paying patient, he was not entitled to recover from the board, even if there had been negligence.

One would like to see the full statement of the grounds of the decision. The courts of Eire are presumably still administering the common law. It is difficult to find any analogy in English decisions. In an old case, where the facts had nothing to do with medical treatment (Shiells *v.* Blackburne, 1789), a judge expressed the following view: "If a man applies to a surgeon to attend him in a disorder for a reward, and the surgeon treats him improperly, that is gross negligence and the surgeon is liable to an action. The surgeon would also be liable for such negligence if he undertook gratis to attend such person, because his situation implies skill in surgery. But if the patient applies to a man of a different employment or occupation for his gratuitous assistance, who either does not exert all his skill or administers improper remedies to the best of his ability, such person is not liable." This case is still cited in modern textbooks.

The liability of a public body for mistakes made by the employees or professional men whom it chooses is, of course, a more complicated matter than the liability of doctor to patient. These problems perhaps will diminish when State insurance covers all accidents and when the State health service includes nearly all medical practitioners.

The Foundling's Birth Certificate

A letter in the *Times* on Oct. 29 and subsequent correspondence have again drawn attention to the unhappy consequences of the disclosure in birth certificates that the person to whom the certificate relates is illegitimate or a foundling. It has been suggested in several quarters that the certificate should omit details which may thus cause pain and prejudice. The proposal would require legislation. The Registrar-General has powers of prescribing forms, but he is obliged by statute at present to see that certain facts are furnished on a birth certificate. Only an Act of Parliament can authorise him to cause something less to be furnished.

There may be no chance, in the existing conditions of streamlined law-making, for the necessary Bill to be introduced. The suggested reform of the foundling's certificate is just the kind of matter which a private Member of Parliament might have taken up. For the past eight years, however, no private Member's Bill has been permitted. The attention recently aroused might usefully lead to the general overhaul of our registration laws. They date from 1836. The world has moved since then.

in isolating the mesenteric and splenic vessels. In spite of this the operation was completed satisfactorily, though unfortunately the patient died on the second day from heart-failure.

ALAN SHORTER.

Mount Vernon Hospital, Northwood, Middlesex.

THE PLEBISCITE

SIR,—Now that the National Health Service Bill has become an Act, it is only at grave risk to their whole future that members of the medical profession can postpone any longer becoming acquainted with the essential features of the measure and making up their minds with a view to appropriate action. This might not have been an easy matter in any circumstances, but it has been made unnecessarily difficult by the confusion of the issue due to the early agreement of the leading political parties and the (probably now repentant) executive of the B.M.A., without a mandate from the representative body, to adopt the principle of a "comprehensive" and centrally controlled service for the nation. By this arrangement before the "fight" began, all they wanted was handed on a plate to the plotters, and all that followed was merely a wordy conflict waged over the whole field of relatively unimportant details. The final act of folly would be to negotiate a settlement on the basis of regulations which the Minister of Health and his successors could alter at will to suit their convenience or at the behest of party bosses behind the scenes.

Above the din of propaganda it is difficult to hear the still small voice of truth; but one thing which must not be missed is the fact that what Parliament has passed is practically an enabling Act giving the Minister of Health dictator powers over those who join the new service. An examination of the Act will reveal that it is an instrument admirably designed for the enforcement of a hidden policy. In this connexion it should be observed that it is a centrally controlled organisation with comprehensive powers over great masses of persons and is *therefore potentially an instrument of aggression, a secret* weapon, a mechanism of dictatorship, capable of being used for the regimentation of the medical profession and of the public whom it serves, prepared in advance against the day when a minority political group, having seized power, is in need of a means to impose its policy upon the people of this country.

In face of all this, what should our policy be—appeasement? No. "He is a foolish man who thinks he can appease a wolf."

The plebiscite—this is not *the* crucial decision: this is OPPORTUNITY writ large. To answer "No" can do no individual doctor any harm, now or in the future. On the contrary, it may save him from the crucial dilemma, at a later stage, of having to choose between enslavement and the risk of starvation for himself and his dependants. It may save the profession and the nation from a great deal more besides.

Bexley, Kent. E. U. MACWILLIAM.

SIR,—May I, through your columns, appeal on the widest grounds to all members of our profession to answer "Yes" to the "plebiscite" sent us by the secretary of the British Medical Association? The Bill has become the Act. The nation has decided that it will have a National Health Service, and in this Act has laid down the general principles under which this should be organised. It is now the time for the details to be filled in by cross-table discussions between representatives of those who serve and of those whom we are to serve. This is not a time in which to hesitate in the service of the State, or for those who have been appointed representatives of all the leading medical bodies in the country to leave, with their work half done, the plough to which they have been called to put their hands. Let us by our votes tell them we think that they should go on.

London, S.E.1. T. B. LAYTON.

SIR,—I am enough of a Socialist to believe that *all* diagnosis and treatment should be available to everyone. Thus far I am sure that most of the profession agree whole-heartedly with Mr. Bevan. But before giving our coöperation in running a new health service we must be sure how large a proportion of those involved, the public and the doctors, will suffer, and what are the compensating gains.

It is clear that better financial backing is neede
the hospitals, and this can surely best be provided b
State. A measure of control of spending is c
necessary; I am not qualified to discuss the pro
method of exercising this control. With regard t
general practitioners, it appears to me that the
reason for the undoubtedly better treatment of the
wealthy patient is that his doctor can afford to
more time with him. The rich man's doctor has
patients and they pay more. The doctor in a wor
man's practice must have more patients since he is
less for each. Improvement can only be obtaine
restricting the working-man's doctor to fewer pat
(and clearly more doctors will therefore be requ
and by paying him more. Mr. Bevan is already pre
the medical schools to take more medical stud
He has, however, refused to make the increases in
ment to the panel doctor suggested by the Spens
mittee. The alternatives to which the panel practiti
will eventually be driven, then, if a capitation basi
payment survives, are either to give up some o
patients and reduce his standard of living (this is
trade-unions call "dilution") or to attempt to cont
his unsatisfactory existence as at present, not ha
the time to do his work as he would wish. His dec
will be helped perhaps by the "indirect directi
of other doctors into his practice; the unempl
doctor, perhaps newly qualified, will probably have
alternatives of accepting this direction or unemploym
Mr. Bevan's *assurance that his power would be*
with benevolence does not carry as much weight
might have done had he accepted the Spens Commit
recommendations. It would appear that "diluti
with a reduced standard of living is the proposed
of the day for panel doctors.

Incidentally, Mr. Bevan proposes that he (and
successors in office) should in future take over
G.M.C.'s disciplinary powers, and he considers th
right of appeal to the law-courts would be unneces
The Minister can do no wrong. The inclusion of su
clause in the Act is in my opinion sufficient for its r
tion by the profession out of hand—but then I am per
still obsessed by the abstracts of freedom and ju
for which we fought.

The only course open to us is to refuse to work
scheme, even though many of us stand to gain by wor
it. Who was it sold his birthright?

When Mr. Bevan consults the profession (and he m
first consult the *Concise Oxford Dictionary* to find
meaning of the word) he will find that our aims are n
the same as his. Then we can start again. I hope we s

London, N.W.3. WILLIAM DUNHA

*** In the heat of the controversy over the insur
capitation fee our correspondent may have forgo
that on July 22 Mr. Bevan promised to apply the find
of the Spens Committee to the remuneration of pr
tioners in the National Health Service. If the profes
agrees to consultation with the Minister on term
service under the new Act it will be able to bas
final decision on specific proposals rather than unha
suspicions.—ED. L.

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—From the back row of the gallery may I appl
Dr. Glaister's letter in last week's issue? As one
has occasionally worked as a locum in mental hospi
I am quite certain that the operative factor in s
patients who have lost their symptoms *after* E.C.T. is
—the age-long restrainer of all animal life.

I am too ignorant to form an opinion on the freque
of this, but Dr. Jan Frank[1] has *reported* that
patients who had undergone a course of E.C.T. all, with
exception, dreaded it; he also *said* that the sight of
apparatus inspired fear in others. But Dr. Millı
brushes all this nonsense aside: "*Many* corresponde
have raised the spectre of fear in reference to E.C
and it is high time that this was laid, once and for all.
That settles it of course—*in Dr.* Milligan's mind. I
it leaves one with a nasty feeling that even if Dr. Fra
were only half right there are *Belsens* within our gates.

---

1. *Proc. R. Soc. Med.* 1945, 38, 317.
2. *Brit. med. J.* 1946, i, 735.

umstances I have come to the conclusion that I should not justified in withdrawing his licence. It is, however, essential t proper care shall be taken of animals kept on laboratory mises, and I am taking up with the appropriate authorities question of improved arrangements for supervising the e of animals at the laboratory in question

The Disabled in Industry

Ir. SIDNEY SHEPHARD asked the Minister of Labour the nber of disabled persons employed in industry and what centage this number represented of the total employed.—GEORGE ISAACS replied: I estimate that the number of istered disabled persons in employment on Sept. 17 last about 590,000, which would represent approximately 6% of the total employed population at that date. This course understates the real percentage of disabled persons employment, as many of them have not yet registered

British Penicillin Production

n answer to a question, Mr. JOHN WILMOT said that the sent rate of production of British penicillin is about 0,000 mega units a month. During September export nces were issued for about 149,000 mega units

---

Obituary

LOUIS EDWARD BARNETT

KT., C.M.G., M.B. EDIN., F.R.C.S.

Sir Louis Barnett, a founder and past-president of the yal Australasian College of Surgeons and emeritus fessor of surgery in the University of Otago, died in nedin on Oct. 28 at the age of 81.

The son of the late Alfred Barnett, of Wellington, he an his medical education in New Zealand and was ong the earliest students at the Otago medical school 1883. He graduated M.B. at the University of Edinburgh with first class honours five years later, and after holding a house-appointment at the Middlesex Hospital, London, he took the F.R.C.S. in 1890. The following year he returned to New Zealand to become surgeon to the Dunedin Hospital and acting lecturer in surgery at the University of Otago. His appointment as lecturer was confirmed in 1896—at a yearly salary of £125—and in 1909 he was appointed to the chair which he occupied till 1924. After his retirement he endowed the chair in memory of his son Ralph, who had n killed in the first world war. From 1914 to 1918 Louis himself served with the R.A.M.C. and N.Z.M.C. consulting surgeon with the rank of lieut.-colonel, he was appointed C.M.G. in 1918.

arnett had made a special study of hydatid disease was chairman of the New Zealand Hydatid Research nmittee. For ten years he was also chairman of the go branch of the British Empire Cancer Campaign, he had probably done more than any other New lander in rousing public opinion to the need for ouraging cancer research. It was largely through his rts that the radium institute was set up in Dunedin.

Generations of medical graduates," writes our v Zealand correspondent, "will remember Sir Louis nett as a careful, thorough, painstaking surgeon, and indly man. He remained a pioneer, and in spite of iculties and discouragements helped to found and iblish the Otago school and the Australasian college. interest in his work persisted to the end, and I have letters, written within a few weeks of his death, nowledging and commenting on case-records of latid disease, of which he collected nearly 2000. He ained the registrar-in-chief for the college until he l, and the shaky handwriting told of a daily fight against ema. Many of his old students attended his last public earance a year ago, when he spoke once more on latid disease at the college meeting in Dunedin."

ir Louis married in 1892 Mabel Violet, daughter of Hon. James Fulton, a member of the Legislative incil of New Zealand. One of their sons, Mr. Geoffrey nett, F.R.C.S., is in practice in Dunedin.

JOSEPH SHAW BOLTON

D.SC., M.D. LOND., F.R.C.P.

Dr. Shaw Bolton, former director of the West Riding Mental Hospital at Wakefield, and emeritus professor of mental diseases in the University of Leeds, died at Beaconsfield on Nov. 12.

Born at Whitby in 1867 he was educated there at Spring Hill School and took his Inter. B.SC. Lond. while working as a pupil to the local doctor. After two years spent as an unqualified assistant in a private asylum and in a general practice in Manchester, he graduated B.SC. at the age of 21, and was able to fulfil his father's condition that he must have saved £100 before he could go to University College, London. Here in 1894 he graduated M.B. and was awarded the gold medal, Atchison scholarship, and Filliter exhibition, and the following year took his M.D. He spent three years in Birmingham as assistant lecturer in physiology before becoming pathologist under Sir Frederick Mott at Claybury, and he held the post of senior assistant medical officer at Hellingly and later at Rainhill before he was appointed to Wakefield in 1910.

On his appointment, Shaw Bolton's anatomical and physiological investigations into the cerebral functions of the brain were already well known, and he was recognised as a worthy successor to such men as Bevan Lewis, Ferrier, Crichton-Browne, and Maudsley who had made Wakefield a centre of scientific progress and research. In July, 1914, he published his magnum opus, *The Brain in Health and Disease*, which he described as an attempt to settle the question of cerebral function on the old-established bases of anatomy and physiology and of histological and clinical pathology. Appearing as it did on the eve of war the book never received the attention it deserved, for by the time the war was over a new school of psychiatry had arisen. Shaw Bolton remained its courageous and doughty opponent, and in his Myth of the Unconscious Mind (*J. ment. Sci.* 1926, 72, 25,) he expressed freely and frankly his views on the Freudian school.

"When Shaw Bolton came to Wakefield," writes M. J. McG., "he found two hospitals—one an acute or admission modern hospital opened in 1900 and the other an old building, many parts of which remained more or less as when the building was opened in 1818. His predecessor's great achievement was the building of the admission hospital, but to Shaw Bolton was left the far more difficult problem of modernising the old building and making the whole hospital one administrative unit. An active and energetic man, his policy was to get things done and not to waste time talking about them. At times indeed he got the work done first and then asked the permission of the committee, permission which was always granted, perhaps with a grumble or two. But Shaw Bolton was a Yorkshireman and had to deal with a committee of Yorkshiremen, and I think they understood and appreciated each other."

In 1910 Shaw Bolton was Goulstonian lecturer of the Royal College of Physicians, and the years that followed brought many other distinctions—Maudsley lecturer in 1925, president of the Royal Medico-Psychological Association in 1928, Henderson Trust lecturer in 1933, hon. D.SC. of Leeds in 1934, Lumleian lecturer in 1935. "But he regards them all," wrote J. K. J. in 1936, "with complacent detachment as accidents in course of loved work; he is only roused to reminiscent enthusiasm by recollections of his early battle to gain footing in a medical school, to get permission to marry as an assistant medical officer, and to establish the first university diploma in psychological medicine."

Shaw Bolton retired in 1933 but quickly re-emerged to become medical superintendent of Buckinghamshire Mental Hospital for an interregnum of six months.

S. R. T. and I. S., who joined the staff of the hospital at this time, write: "We found the temporary chief a

Parliament

FROM THE PRESS GALLERY

Winter in Germany

SPEAKING in the debate on the King's Speech Mr. A. EDEN said that, though the Government claimed that in Germany they had won a victory in the battle of last winter, it was clear that the battle of this winter would be infinitely sterner. The Lord President of the Council had told the House on May 23 that the United States government had agreed that there should not be a starving British zone in Germany side by side with an American zone getting assured supplies. Both zones should have the same standard of rationing and the same degree of assurance that their supplies should not suddenly come to an end. Now there was a desperate food crisis in our zone. How, Mr. Eden asked, did that square with the assurance which Mr. Morrison got from the American government last May? Mr. Eden could understand the food position becoming desperate next spring, but it was impossible to conceive how it could become desperate now, after a good local harvest, unless there was maldistribution, which meant bad administration.

Mr. J. HYND, the Chancellor of the Duchy of Lancaster, freely admitted that there had been delays and difficulties inseparable from a quadripartite administration. Maintenance of the present health standards of the German people, low as they were, and the regular distribution of rations, low as they sometimes had to be, had been something of a miracle. He agreed that we were facing another grim winter, but he did not share Mr. Eden's apprehensions that the battle of this winter was going to be as difficult as that of the last. He attributed the sudden excitement and publicity regarding the German food situation to two factors. First, United Kingdom reserves had run down and shipments were in arrear, so that there was no question of switching British shipments to Germany as in the past. Secondly, local-government representatives had assumed responsibility for collection and distribution of food, and, having seen the statistics, they were shocked at the situation which they had to face. Another factor in the situation was that the Government had deliberately increased the ration to 1550 calories a few weeks ago. The reason was not that we had more stocks, or more food in sight, but because the situation in Germany made that action inevitable. It would have been inhuman to expect the Germans to live, produce, or do anything whatever on 1000 calories. In spite of the difficulties, Mr. Hynd continued, they had every reason to expect at least 80% overall of the 1550 calories ration—at any rate until the end of this month. By that time he hoped that the conference with our American allies would have produced the answer. The German harvest had been quite good in the circumstances, and had produced 1½ million tons of grain, which was being collected and threshed as expeditiously as possible and consumed currently.

As to the question whether common ration standards and pooling resources would operate, and whether the agreement reached by the Lord President of the Council last March was to be operated, Mr. Hynd hoped he would not be pressed in the matter because implementation of that policy was being discussed at the present time, and unless it were carried out it would be impossible to achieve any kind of progress in the development of the British zone or British and United States zones.

Dr. BARNET STROSS felt that the world food situation could hardly be worse. He had hoped that Sir John Orr would have succeeded in his ambition to bring about a World Food Board. Today a little over half the people in the world had less than 2250 calories, less than a third had over 2750 calories. In the world at any time there were apparent food surpluses in some areas and great need and famine conditions in others. Where surpluses seemed to exist there had been no control and planning. Recent developments in America had caused despondency and disappointment. But if America threw away wilfully her opportunity of leading the world that did not mean that Britain and the Commonwealth and every other country willing to combine with us should not say that there was no reason why people should die unnecessarily when there was a food glut in many parts of the world.

QUESTION TIME

Full-time M.O.H.s

In the House of Lords on Oct. 28 Lord MERTHYR asked the Government in how many county districts in England and Wales medical officers of health were still permitted to engage in private practice; in which counties these districts were situated; and what steps were proposed to be taken to ensure that the whole country was served by full-time medical officers without further delay.

The Earl of LISTOWEL replied: There are 511 county districts in England and 111 in Wales where the M.O.H. is not restricted from engaging in private practice. All counties except three have formulated arrangements to secure that as vacancies occur doctors appointed shall be restricted from engaging in private practice. Steady progress was being made before the war in securing the appointment of whole-time M.O.H.s, but acute shortage of medical man-power interrupted the process. A number of county district councils whose proposals for full-time permanent appointments had on that account to be deferred are now putting them forward again. These proposals have to be considered in the light of changed circumstances—for example, the proposed modification in the duties of the M.O.H. under the National Health Service proposals—and in some instances it is necessary to discuss with the authorities concerned whether any alteration of the original arrangement is desirable. The Government are in full accord with the view that the employment of full-time medical officers of health throughout the country is an object to be attained with all practicable speed.

Hospital Staffs

Mr. E. A. HARDY asked the Minister of Labour whether, in view of the fact that the London Provincial Council had failed to implement the recommendations of the National Joint Council for Hospital and Institution Staffs, he would give an assurance that any decisions reached by the Provincial Council would date from the pay-week in which April 1, 1946, fell.—Mr. GEORGE ISAACS replied: The date from which any decisions of the London Provincial Council should operate would be a matter for the council. I have no authority to intervene.—Mr. HARDY: In view of the widespread complaints of shortage of hospital staffs, is the Minister aware that such staffs in this country are seething with discontent because of the failure of the National Joint Council, which was set up in 1945, and that, despite the recommendations made in March this year that it should operate from April 1, nothing has been done so far as the London Provincial Council is concerned? They have never had a meeting.—Mr. ISAACS: The council is in some difficulty as to its constitution, and I have no power to intervene, although I am exercising what little influence I possess to speed up its establishment.—Mr. A. EDEN: Is it true that this council has never even met?—Mr. ISAACS: The London Provincial Council has not met because there is an argument as to the basis of its constitution.

Continuation of Unrra Supplies

Replying to questions, Mr. E. BEVIN stated that the Government had decided not to support the continuation of UNRRA after the completion of its present programme of operations, which will last well into 1947, largely because, in their view, the problem will then be no longer one of relief. The needs of countries are not uniform and it really becomes a question of balance of payments which will have to be taken into account. The fifth session of the council adopted a resolution to go into this problem of balance of payments, and the Government, in view of their own limited resources, cannot pledge themselves to undertake any further liability except in cases of proven need.

Cereal Exports to Europe

Replying to a question, Mr. H. A. MARQUAND stated that the quantity of grain and grain products sent from the United Kingdom to all European countries was 116,400 tons in the six months ended September, 1946, of which 70,200 had gone to Germany.

Physiological Experiments on Cats at Oxford

Mrs. LEAH MANNING asked the Home Secretary whether his attention had been called to the dismissal of the appeal by a professor of physiology, Dr. E. G. T. Liddell, against his conviction for causing unnecessary suffering to cats at Oxford University; and whether he would consider withdrawing his certificate to experiment.—Mr. C. EDE replied: Dr. Liddell has not been guilty of any offence or irregularity in the performance of experiments, and after reviewing all the circumstances I have come to the conclusion that I should not be justified in withdrawing his licence. It is, however, essential that proper care shall be taken of animals kept on laboratory premises, and I am taking up with the appropriate authorities the question of improved arrangements for supervising the care of animals at the laboratory in question.

The Disabled in Industry

Mr. SIDNEY SHEPHARD asked the Minister of Labour the number of disabled persons employed in industry; and what percentage this number represented of the total employed.—Mr. GEORGE ISAACS replied: I estimate that the number of registered disabled persons in employment on Sept. 17 last was about 590,000, which would represent approximately 3·76% of the total employed population at that date. This of course understates the real percentage of disabled persons in employment, as many of them have not yet registered.

British Penicillin Production

In answer to a question, Mr. JOHN WILMOT said that the present rate of production of British penicillin is about 360,000 mega units a month. During September export licences were issued for about 149,000 mega units.

Obituary

LOUIS EDWARD BARNETT

KT., C.M.G., M.B. EDIN., F.R.C.S.

Sir Louis Barnett, a founder and past-president of the Royal Australasian College of Surgeons and emeritus professor of surgery in the University of Otago, died in Dunedin on Oct. 28 at the age of 81.

The son of the late Alfred Barnett, of Wellington, he began his medical education in New Zealand and was among the earliest students at the Otago medical school in 1883. He graduated M.B. at the University of Edinburgh with first-class honours five years later, and after holding a house-appointment at the Middlesex Hospital, London, he took the F.R.C.S. in 1890. The following year he returned to New Zealand to become surgeon to the Dunedin Hospital and acting lecturer in surgery at the University of Otago. His appointment as lecturer was confirmed in 1896—at a yearly salary of £125—and in 1909 he was appointed to the chair which he occupied till 1924. After his retirement he endowed the chair in memory of his son Ralph, who had been killed in the first world war. From 1914 to 1918 Sir Louis himself served with the R.A.M.C. and N.Z.M.C. as consulting surgeon with the rank of lieut.-colonel, and he was appointed C.M.G. in 1918.

Barnett had made a special study of hydatid disease and was chairman of the New Zealand Hydatid Research Committee. For ten years he was also chairman of the Otago branch of the British Empire Cancer Campaign, and he had probably done more than any other New Zealander in rousing public opinion to the need for encouraging cancer research. It was largely through his efforts that the radium institute was set up in Dunedin.

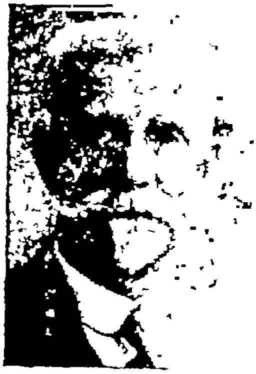
"Generations of medical graduates," writes our New Zealand correspondent, "will remember Sir Louis Barnett as a careful, thorough, painstaking surgeon, and a kindly man. He remained a pioneer, and in spite of difficulties and discouragements helped to found and establish the Otago school and the Australasian college. His interest in his work persisted to the end, and I have two letters, written within a few weeks of his death, acknowledging and commenting on case-records of hydatid disease, of which he collected nearly 2000. He remained the registrar-in-chief for the college until he died, and the shaky handwriting told of a daily fight against œdema. Many of his old students attended his last public appearance a year ago, when he spoke once more on hydatid disease at the college meeting in Dunedin."

Sir Louis married in 1892 Mabel Violet, daughter of the Hon. James Fulton, a member of the Legislative Council of New Zealand. One of their sons, Mr. Geoffrey Barnett, F.R.C.S., is in practice in Dunedin.

JOSEPH SHAW BOLTON

D.SC., M.D. LOND., F.R.C.P.

Dr. Shaw Bolton, former director of the West Riding Mental Hospital at Wakefield, and emeritus professor of mental diseases in the University of Leeds, died at Beaconsfield on Nov. 12.



Born at Whitby in 1867 he was educated there at Spring Hill School and took his Inter. B.SC. Lond. while working as a pupil to the local doctor. After two years spent as an unqualified assistant in a private asylum and in a general practice in Manchester, he graduated B.SC. at the age of 21, and was able to fulfil his father's condition that he must have saved £100 before he could go to University College, London. Here in 1894 he graduated M.B. and was awarded the gold medal, Atchison scholarship, and Filliter exhibition, and the following year took his M.D. He spent three years in Birmingham as assistant lecturer in physiology before becoming pathologist under Sir Frederick Mott at Claybury, and he held the post of senior assistant medical officer at Hellingly and later at Rainhill before he was appointed to Wakefield in 1910.

On his appointment, Shaw Bolton's anatomical and physiological investigations into the cerebral functions of the brain were already well known, and he was recognised as a worthy successor to such men as Bevan Lewis, Ferrier, Crichton-Browne, and Maudsley who had made Wakefield a centre of scientific progress and research. In July, 1914, he published his magnum opus, *The Brain in Health and Disease*, which he described as an attempt to settle the question of cerebral function on the old-established bases of anatomy and physiology and of histological and clinical pathology. Appearing as it did on the eve of war the book never received the attention it deserved, for by the time the war was over a new school of psychiatry had arisen. Shaw Bolton remained its courageous and doughty opponent, and in his Myth of the Unconscious Mind (*J. ment. Sci.* 1926, 72, 25,) he expressed freely and frankly his views on the Freudian school.

"When Shaw Bolton came to Wakefield," writes M. J. McG., "he found two hospitals—one an acute or admission modern hospital opened in 1900 and the other an old building, many parts of which remained more or less as when the building was opened in 1818. His predecessor's great achievement was the building of the admission hospital, but to Shaw Bolton was left the far more difficult problem of modernising the old building and making the whole hospital one administrative unit. An active and energetic man, his policy was to get things done and not to waste time talking about them. At times indeed he got the work done first and then asked the permission of the committee, permission which was always granted, perhaps with a grumble or two. But Shaw Bolton was a Yorkshireman and had to deal with a committee of Yorkshiremen, and I think they understood and appreciated each other."

In 1910 Shaw Bolton was Goulstonian lecturer of the Royal College of Physicians, and the years that followed brought many other distinctions—Maudsley lecturer in 1925, president of the Royal Medico-Psychological Association in 1928, Henderson Trust lecturer in 1933, hon. D.SC. of Leeds in 1934, Lumleian lecturer in 1935. "But he regards them all," wrote J. K. J. in 1936, "with complacent detachment as accidents in course of loved work; he is only roused to reminiscent enthusiasm by recollections of his early battle to gain footing in a medical school, to get permission to marry as an assistant medical officer, and to establish the first university diploma in psychological medicine."

Shaw Bolton retired in 1933 but quickly re-emerged to become medical superintendent of Buckinghamshire Mental Hospital for an interregnum of six months.

S. R. T. and I. S., who joined the staff of the hospital at this time, write: "We found the temporary chief a most impressive yet congenial person—reddish bearded, hair en brosse, reminding one rather of Captain Kettle—obviously enjoying his return to daily clinical work with all the relish of a retired master mariner taking the bridge once again. He had the sure and confident touch that marked the school of psychiatry to which he belonged. Strong and decisive when the occasion demanded, he had a notable humility about his own painstaking and valuable contributions to knowledge. A vivid personality with a keen sense of humour, he was no stickler for outward pomp. If there was a job to be done, he would get it done in the shortest and most efficient way. He did not hesitate, for example, to take up his abode in a patient's single room off one of the wards and to use the 'office' as his dining-room, living-room, and consulting-room; for this was the simplest and most efficient way of keeping himself on the spot in reasonable comfort. Untroubled by concessions to orthodoxy, he was adaptable to an extraordinary degree, yet he never lost command of a situation, nor one iota of his dignity. His association with the Bucks Mental Hospital was brief, but it was decisive and a landmark in the history of the hospital. The visiting committee, in recognition of his services, appointed him as their honorary consulting physician, and for some years after his final retirement in 1935 he maintained active interest in the hospital and many congenial contacts with its staff."

Dr. Shaw Bolton leaves his widow with two sons and a daughter. The elder son is a doctor who played football for England, and his daughter is also a doctor.

HARRY ROBERTS

L.M.S.S.A.

On Nov. 12 death removed from our midst, at the age of 75, one of those rare members of our profession who are much more than mere doctors. Harry Roberts combined an inborn faculty for good doctoring with a clear vision of what medicine stood for in terms of the Common Health and a passionate love of Mother Earth and all the gifts she holds for her children. These were, indeed, the three aspects of his life and work—doctor, humanist, and countryman.

Harry Roberts was born at Bishop's Lydiard, in Somerset, in 1871, was educated at Taunton and Bristol, and pursued his medical studies at St. Mary's Hospital medical school, whence he qualified L.S.A. in 1895. He had married in 1892. After practising at Hayle, in Cornwall, for eight years, he moved to London, and for two years, living at Vauxhall Mansions, he dabbled in politics, being attracted to various Labour groups and causes, and becoming one of the leaders of the Tariff Reform movement. He flirted with the Fabians, whose society had been founded in 1886, and it looked as though he would forsake medicine as a career for the political arena. In 1905, however, he returned to practice at Aldgate, and, eight months later, moved to Stepney, where he became a very successful and popular general practitioner, continuing in active work there for nearly forty years.

He built up an enormous clientèle. The introduction of the National Insurance Act in 1912 brought panel patients to his surgery in flocks: in 1924 there were more than 10,000 names on his books. He was at this time helped by four assistants and by a secretariat of able women. There were always two doctors on duty, and the practice was organised to the last degree of efficiency. The Ministry of Health was wont to send inquiring Americans and others anxious to see the panel scheme in action to Stepney for an ocular demonstration.

During a long and active life Roberts's literary output was enormous. As early as 1904 he was editing Walt Whitman and Thoreau for English readers. He had published *The Sayings of Jesus* in 1903. (Forty years later he attempted something on similar lines, but more ambitious, *The Philosophy of Jesus*, written in collaboration with a medical colleague.) He began to appear in literature as a sociologist as early as 1892, three years before he qualified as a doctor, with a small book on *Population and Social Reform*. This was followed by *Constructive Conservatism* (1913) and a more serious effort, *National Health Policy*, in 1923.

Roberts's efforts to bridge the gap between academic medicine and the popular demand for help on general hygienic lines produced what was probably his most successful work, *Everyman in Health and Sickness*, published by Dent in 1935. He was arranging for a modernised edition of this book at the time of his death. *Euthanasia* appeared in 1933 and *The Troubled Mind* in 1938. His contributions on kindred lines in the journals were very numerous. As a reviewer he was in great demand, as the columns of the *Times Literary Supplement*, the *Spectator*, and the *New Statesman* testify. He was an incisive but admittedly fair critic.

The third aspect of Roberts's life and work was known to thousands who never came across him as a doctor nor realised that the "green fingers" which he possessed in all matters connected with the soil and its products were also at his command when the sick person needed him. In 1908 he built a house to his own design high up in the Hampshire "hangers," and lived here and in busy Stepney the double life with which his many friends became familiar. His books on the country life sufficiently proclaim his activities. But many years before this he had revealed this side of his nature. *The Chronicles of a Cornish Garden* and *Old Fashioned Flowers* appeared in 1901, *The Tramp's Handbook* and *The Still Room Book* in 1903. In 1915 he published *All about Gardening*. Roberts enjoyed the distinction of being the only author with two volumes to his credit in the *Britain in Pictures* series: he wrote *Rebels and Reformers* in 1942 and *English Gardens* in 1944. He was an authority on gipsies, brewed excellent cider, made large quantities of saleable pot-pourri, and knew all that could be done with the compost-heap without making a god of "humus."

He was as good a talker as writer. There were few men and women "in letters" who did not visit him at Oakshott, and his correspondents were even more numerous than his guests. He was at endless pains to avoid giving offence and was quick to redeem the lapse when it occurred. Of the "little, nameless, unremembered acts of kindness and of love" that measure a good man's life his host of friends can testify abundantly.

Roberts suffered a severe attack of congestive heart-failure in 1942. He recovered as the result of much care on the part of devoted friends. As the result of equal care he lived a fairly active life until his sudden death whilst sitting at his writing table. His was a virile, restless, and dynamic soul, but he was highly constructive and sane in his outlook and he achieved much in a field that was new when he entered it—the field of Social Medicine. When H. M. Tomlinson heard of his friend's death he said: "But he's more alive still than most of us." The comment makes a fitting epitaph for one whose spirit lives and whose work endures. H.

> ". . . Whose liberal virtues freed his fretting soul
> To see life steady and to see it whole."

So his friend Horace Horsnell wrote of Harry Roberts about the time of the 1914–18 war. It is a nutshell picture of a man as humane and rebellious as Thomas Wakley, as witty as Falstaff, as various as Cleopatra; shrewd, too, and with a gift for lifelong friendships.

Long ago he bought a beech-filled valley in Hampshire, where he and his friends used to go to camp, and to plan a house. In time they put up huts in the woods, and stayed there often. At last the imagined house began to grow, half-way between the valley and the crest of the hanger.

> At first it was like an ancient manor house—a single great room with an open fireplace—but over the years more rooms clustered about it, until, within the last decade, his sister added a bathroom. Roberts was indignant. "Now it's like anybody else's house," he complained. But it was not. Oakshott had a special quality, quite indescribable, created by Harry Roberts and those who shared it. A friendly house, full of friendly people, where the cooking was done brilliantly (Roberts was an expert, and

so were his companions) in the intervals of discussion on war, society, and art, where helpers from the village were spoken of as retainers, lest anyone should fancy them serfs, where little cats grey as squirrels blew about like smoke, and where Roberts and the good company who sought him talked, heard music, and joined—earnestly or casually—in the work of house, farm, and garden.

He was a good neighbour; the town hall at Petersfield was built largely through his efforts: and during this war he founded a local youth club, and then helped the young people to take over the full responsibility for it.

He was like no other landowner. Once he discovered in an old map a forgotten right-of-way crossing his land; he hurried out to clear the path and put up inviting notices. The other end of this path crossed the land of a farmer who was far from sharing his enthusiasm. They corresponded, and for a week the farmer was Roberts's blackest villain; then he went to see him and came back cheered and pacified. The farmer was a splendid fellow: it was true he didn't want hikers going straight through the farmyard, but was perfectly willing to open an alternative route.

This was characteristic: Roberts had only to see and talk to an opponent to recognise his good points and give generous credit for them. Implacable over principles, he was always sympathetic to persons. That is why his death has robbed so many of a great friend.

He leaves a son and daughter, three grandchildren, and two great-grandchildren. M. N. J.

NIKOLAI BURDENKO

News of Colonel-General Burdenko's death has swiftly followed his resignation, because of ill health, from the presidency of the Soviet Academy of Medical Sciences. As surgeon-in-chief to the Red Army, member of the Supreme Soviet, and director of the Moscow neurosurgical institute, he was a great figure in Soviet life as well as in Soviet surgery.

Born in 1878, the grandson of a serf, he served in a Red Cross detachment during the Russo-Japanese War and received the Soldier's Cross of St. George for bravery. In 1904 he graduated in medicine at the University of Dorpat, and four years later he was appointed to a chair there. Postgraduate work in Pavlov's laboratory followed, and during the 1914–18 war he served as a consultant surgeon, becoming chief of the Russian army medical service in 1917. In 1924 he went to Moscow with the task of establishing the first Soviet neurosurgical institute. Here he built up a strong team of neurologists who derived from Pavlov's school.

Burdenko himself specialised in the surgery of the central nervous system, and under his leadership the Army service for injuries of the brain and cord was extremely well organised, with interchangeable teams from front line, through the base hospital, to convalescence in the Far East. Among his colleagues he was especially honoured for his operations for tumours of the third and fourth ventricles and in the pituitary and posterior cranial fossa. A British surgeon who watched him operating in 1943, when his powers were admittedly already impaired by his physical disabilities, found his technique less advanced than that obtaining in the neurosurgical clinics of this country or America. But there was no doubt of the devotion, esteem, and respect which Burdenko's vital personality and stimulating teaching had inspired among the professoriate and the "young men," and of the influence he exerted on the medical profession throughout Soviet Russia. The medical service he did so much to foster accomplished great things for the Red Army.

On Active Service

CASUALTY

Flight-Lieutenant Raymond George Blackledge, previously reported as missing, has now been presumed to have died about Jan. 20, 1945, while a prisoner-of-war in Japanese hands. Born in 1912, he studied medicine at Oxford University and St. Thomas's Hospital and graduated B.M. in 1937. After holding house-appointments at St. Thomas's, the Radcliffe Infirmary, Oxford, and the Miller General Hospital, Greenwich, he was commissioned as flying-officer in the medical branch of the Royal Air Force Volunteer Reserve in September, 1940.

Appointments

Antonio, R. F., M.B. Edin.: M.O., Gold Coast.
Beal, J. R., M.D. Manc., D.P.H.: senior tuberculosis officer, Northumberland County Council.
Clouston, G. S., M.D. Lpool, D.P.M.: psychiatrist, West Suffolk and Ipswich Education Committees.
Litchfield, J. W., B.M. Oxfd, M.R.C.P.: physician i/c outpatients, St. Mary's Hospital, London.
Muir, Clement, M.B. Edin., M.R.C.P.E., D.P.H.: principal assistant M.O., Surrey County Council.
Preston, J. R., M.B. Glasg., D.P.H.: M.O.H., Sutton Coldfield.
Read, M. T., M.C., M.R.C.S.: M.O., Malaya.

London County Council Assistant Medical Officers on Central Administrative Staff:

- Austin, F., M.R.C.S.
- Cran, E. M., M.B. Aberd., D.P.H.
- Harrison, T. H., M.R.C.S.
- Peet, F. L., M.D. Durh., L.D.S.
- Thomson, R. T., M.B. Glasg., D.P.H.

Diary of the Week

NOV. 24 TO 30

Sunday, 24th

Family Planning Association
10.30 A.M. (Gas Industry House, Hyde Park Corner, S.W.1.) Conference. (1) Experience of some Local Authorities in Providing Contraceptive Advice within the Terms of the Ministry of Health Memoranda; and (2) Clinical Problems in Contraceptive Technique and the Atypical Cases.
2.30 P.M. Developments in the Treatment of Subfertility and their Application to Clinics.

Monday, 25th

Royal Society of Medicine, 1, Wimpole Street, W.1
5.30 P.M. *Odontology.* Mr. D. Greer Walker: Severe Infections of the Mandible. Prof. M. A. Rushton: Regional Osteitis Fibrosa Affecting the Facial Bones.
Medical Society of London, 11, Chandos Street, W.1
8.30 P.M. Mr. W. M. Mollison, Dr. Philip Cloake: Diagnosis and Treatment of Aural Vertigo.

Tuesday, 26th

Royal Society of Medicine
5 P.M. *Medicine.* Dr. E. B. Ford, Mr. Aleck Bourne, Dr. Kenneth McFadyean, Mr. Justice Humphreys: Birth Control: Some Medical and Legal Aspects.
London School of Dermatology, 5, Lisle Street, W.C.2
5 P.M. Dr. H. Gordon: Limitations of X-ray Therapy in Dermatology.
Edinburgh Postgraduate Board for Medicine
5 P.M. (Royal Infirmary.) Mr. D. M. Douglas: Experimental Approach to Surgery.

Wednesday, 27th

Royal Institute of Public Health and Hygiene, 28, Portland Place, W.1
3.30 P.M. Miss Barbara Low: Juvenile Delinquency.
National Hospital, Queen Square, W.C.1
5 P.M. Dr. F. M. R. Walshe, F.R.S.: Contribution of Clinical Study to the Physiology of the Cerebral Motor Cortex. (Victor Horsley lecture.)

Thursday, 28th

University of London
5 P.M. (University College, Gower Street, W.C.1.) Sir Joseph Barcroft, F.R.S.: Flora of the Alimentary Canal.
Royal College of Surgeons, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. R. W. Raven: Diseases of the Pharynx and Œsophagus. (Erasmus Wilson demonstration.)
Royal Society of Medicine
5 P.M. *Urology.* Mr. R. H. O. B. Robinson: Problems of Renal Lithiasis. (Presidential address.)
Medico-Legal Society
8.15 P.M. (26, Portland Place, W.1.) Mr. Ivor Back: Murder of Miss Gilchrist.
Middlesex County Medical Society
3 P.M. (Chase Farm Hospital, Enfield.) Cases will be shown. Mr. J. A. Dunlop: Prevesicular Prostatectomy.
Socialist Medical Association
7.30 P.M. (296, Vauxhall Bridge Road, S.W.1.) Dr. F. Avery Jones: Social Aspects of Peptic Ulcer.
London School of Dermatology
5 P.M. Dr. A. D. Porter: Vitamin A in Dermatology.

Friday, 29th

Royal College of Obstetricians and Gynæcologists, 58, Queen Anne Street, W.1
5 P.M. Dr. J. F. Loutit: Rhesus Factor.
Royal Society of Medicine
5.45 P.M. *Endocrinology.* Cases will be shown at 5 P.M.
London Chest Hospital, Victoria Park, E.2
5 P.M. Dr. J. R. B. Hern: Asthma.

Saturday, 30th

Medical Society for the Study of Venereal Diseases, 11, Chandos Street, W.1
2.30 P.M. Dr. J. A. W. McCluskie: Cardiovascular Syphilis.

In our leading article on the Artificial Kidney last week (p. 720) "plasma phæresis" should read "plasmaphæresis" from πλάσμα + ἀφαίρεσις (=removal).

Notes and News

LONDON MEDICAL EXHIBITION

THE exhibition, the first since 1938, was held this week in the Royal Horticultural Society's hall. The displays were an excellent reminder of the many war-time innovations. Medicines on a stand all look much the same; but in the various new gadgets there was much to draw the eye of the casual visitor. Plastics, as might be expected, are coming to the fore—for example, in the manufacture of stethoscopes; they are also being used for aspherical magnifying glasses, which are light and fairly cheap, and magnify three or four times without distortion over a large area, so that there is little discomfort in reading with them. For the ophthalmologist there is, too, a new rotary drum to hold trial lenses in much less than the normal compass. For eye and ear work there are droppers from which the fluid is obtained by warming the container in the grip; the number of drops is easily controlled, and the solutions are said to remain virtually sterile for at least two to three years. Then there are new devices for the liberation of penicillin and other antibacterial agents as a fine vapour into the air of ward or office. Perhaps the most interesting exhibit was a prototype electrically operated machine for the automatic control of respiration; clinical trials are reported to have proved its value in intrathoracic operations. The rhythm, rate, and depth of respiration can be readily controlled, and intrabronchial suction is possible. The machine, which is simple and light, should have a future as a resuscitator—by the sea, in the wards, and even in ambulances.

DENTAL DEADLOCK

THE Joint Advisory Dental Council has expressed its willingness to reopen discussions with the Minister of National Insurance on the fees payable for insured persons. At present dentists are doing no work under N.H.I. on the grounds that they cannot provide a satisfactory service on the fee scale offered by the Minister. In Parliament on Oct. 25 the Minister suggested that the approved societies could not afford the higher scale proposed by the Dental Council; the council does not agree with this view but is willing to discuss the point and put forward means of solving the difficulty.

A PHARMACIST'S VIEW

SPEAKING in London on Oct. 21, Mr. Hugh Linstead, M.P., secretary of the Pharmaceutical Society, said: "Running through proprietary medicine advertising there is a general disparagement of the medical profession. . . . It is a commonplace of testimonial advertising that the general medical practitioner is disparaged, and by implication the National Health Service. . . . There are at present far too many completely worthless medicines being sold to the public. I am quite certain that far too many advertisements skate on the very thin ice of creating fear. . . . I think that varying standards should all be amalgamated and the proprietary medicines industry might very well set up a council of public men . . . who . . . might be prepared to pass the proprietary medicine brought before them. I think you must have a register of medicines and makers . . . you must have a prohibition against false and fraudulent claims." Formulas, he concluded, should be laid down by the advisory committee and not by the manufacturer.

A SCIENTIFIC NEWS-LETTER

ANY publication that helps to spread the scientific outlook among general readers deserves a hearty welcome. *Science To-Day*[1] sets out to do this in a weekly news-letter of eight small pages, giving the layman the why and wherefore—not thrusting sensational items, to be gaped at as nine-day wonders, before a goggle-eyed audience. The first four pages contain news items, mostly culled from the current technical journals; the remainder are given up to a background article reviewing some larger subject of topical interest. The early issues mention such widely different topics as fish migration, radar, nuclear physics, Giacobini-Zinner meteors, penicillin, thyroid chemistry, cosmic rays, curare, gas turbines, and calculating machines. The doctor who likes to keep in touch with the growing points on the tree of knowledge will enjoy this little journal.

THE CHURCHES' COUNCIL OF HEALING

THE third of a series of lectures arranged by the Churches' Council of Healing is being given at Denison House, 296 Vauxhall Bridge Road, London, S.W.1, on Dec. 11 at 7 P.M when the Rev. J. Crowlesmith, secretary of the Methodi Society for Medical and Pastoral Psychology, will speak o Possibilities of Coöperation between Doctors and Clergy in th Healing of the Sick.

Since the purposes of this council are not generally known it may be useful to note here that the late Archbishop Temple who founded it, was deeply anxious to reconcile religion and science, and especially the practice of medicine and the practice of religion. "His chief aim" (writes a doctor interested in the work) "was to bring together the many branches of the modern divine and spiritual healing movement on the basis of an acceptance of the assured results of modern science and a belief in the value of divine healing. By this means he believed that a real unification of all the forces that make for health and healing may be achieved, and in particular that the healing work of the medical profession might be united to an equally important healing mission of the Christian Church in all its branches."

Such a synthesis of aims could hardly have been conceived much less approached, in the last century; but in modern medicine the non-physical factors are assuming increasing importance; and the materialist hypothesis, our correspondent suggests, has itself been placed on the defensive. "Doctors are asking by what philosophy they shall guide their practice. Ordinary people are asking a similar question." The movement initiated by the Archbishop aims at "integrating the humanist tradition characteristic of modern scientific medicine with the 'supra-humanist' tradition characteristic of the Christian Church. This integration seems to have been achieved without the sacrifice of the truths and values either of scientific medicine or religion. The practice of divine or spiritual healing is conceived as being the *completion* of the work of modern medicine and not as a *substitute* for it."

This interpretation of the work of the Council of Healing is in line with a resolution adopted in the Lower House of Convocation of York on Oct. 17, asking Dr. C. F. Garbett, the Archbishop, to appoint a joint committee to consider the use of psychology in the pastoral office of the clergy and "the steps needed to regularise the work of priest psychologists." The *Manchester Guardian* (Oct. 9) pointed out that this recalls a resolution passed in the Upper House of Convocation in 1938, welcoming "the movement for developing consultation and coöperation between clergy and doctors, especially medical psychologists."

SCOTTISH MENTAL HOSPITALS' PATHOLOGICAL SCHEME

THIS scheme has now become a division of the pathology department of Edinburgh University. The board's 48th annual report indicates that the change has reduced the annual expenditure under the scheme; the surplus revenue is to be made available for research to those employed by the contributing hospitals, and possibly to others.

MIDGET HEARING AID

Messrs. Amplivox Ltd., of 2, Bentinck Street, W.1, have produced a new hearing aid which they call the 'Omnipac' and which they claim is the smallest in the world. As the name suggests, the whole mechanism is compactly made up in one case from which runs the lead to the earpiece. The case measures 4 in. × 2$^1/_2$ in. × 1 in. and weighs complete with batteries 10 oz. This relatively midget size has been achieved by a new miniature valve and miniature batteries of high output. It is claimed that the low-tension battery, costing 1*s.* 6*d.*, is of revolutionary design, giving an unlimited shelf life with a life of 30 hours on continuous load, while the high-tension battery costs 3*s.*, has a shelf life of months, and lasts 100 hours on load. There is also a new type of earphone which can be used with the aid, requiring no head-band and fitting comfortably in the meatus. The performance of the aid is most satisfactory and as good as any standard valve-amplifying instrument. An additional unit can be supplied for use with a telephone which plugs into spare sockets on top of the aid. This is a useful and successful device. The instrument marks a definite advance in construction. It sells at 21 guineas, the telephone unit costing 2 guineas extra.

---

[1] Edited by A. W. Haslett, M.A., 104, Clifton Hill, London, N.W.8. Annual subscription 30*s.*

DELAY IN SUPPLY OF SPECTACLES

THE Faculty of Ophthalmologists recently appointed a subcommittee, on which the manufacturing opticians were represented, to investigate the delay in the supply of spectacles. It is anticipated that in twelve months the accumulation of orders which is causing the delay will have been dealt with and that deliveries will be back nearly to normal; but it was agreed that in the meantime six suggestions should be published for the consideration of prescribing surgeons and opticians. The council of the faculty believe that the adoption of these suggestions would result in an immediate improvement in the situation. The suggestions are as follows:

1. Except in cases of genuine medical urgency, avoid priority orders.
2. Unless there are good reasons for the contrary, avoid prescribing $^1/_8$ powers, and $^1/_4$ powers over 4D.
3. In the lower ranges, covering the "stock powers," prescribe *flat* lenses; except in the case of bifocals, which are more easily obtained in toric form.
4. Avoid ordering tinted lenses wherever possible. When ordered, give alternative tints.
5. Where possible, indicate on the prescription that a variation of $^1/_4$D up or down is permissible. It is suggested that this should be done by the sign " ±0·25 " on the prescription.
6. Avoid prescribing prisms unless really necessary. All prescriptions including a prism, other than those that can be dispensed by decentration, demand special grinding.

MOBILE EXHIBITIONS OF NURSING

To encourage nursing recruitment, the Ministry of Labour and National Service have launched two mobile exhibition vans, which are to visit villages and the smaller towns. The exhibition, which consists of cheerful and informative photographs of nurses in various stages of training, at work and at play, is mounted on and inside a very large trailer, drawn by a tractor on the roof of which a loud-speaker is mounted. Inside, besides more pictures, there is a small comfortable interviewing room, whose cork-lined walls are sound-proof. Here the prospective candidate for nursing can talk to one of the technical nursing officers of the Ministry, and also, thanks to collaboration promised by local hospitals, with a young nurse in training in the region. The loud-speaker microphone is in this little room, and a gramophone beneath it can be used to broadcast music. During the next month these vans will tour the southern and south-western regions, near Reading and Salisbury. In launching one of the vans on Nov. 13, Mr. George Isaacs, the Minister of Labour, noted how much thought and hard work had gone to the making of the exhibition. It should help to maintain the rise in nursing recruitment which has gone on since the beginning of the century; and if the interviews are well conducted, as seems likely, it may also help to reduce the present high wastage of recruits.

PSYCHOLOGY OF STUDY

A CORRESPONDENT signing himself "Ex-Service M.O." wrote asking advice on the best method of preparing for an examination while carrying on with a full-time job. His letter appeared in THE LANCET of August 31, p. 312. Dr. W. H. Perry now writes from Vancouver, saying: "I would refer your correspondent to a little book, *Doctor in the Making*, by A. W. Ham and M. D. Salter, of the University of Toronto, published by J. B. Lippincott and Co. It is very pleasant reading and while designed for the junior undergraduate can be very helpful to those preparing for higher examinations; particularly those of us who, on account of the recent unpleasantness, have suffered a severe and prolonged interruption of our study habits."

RADIOLOGICAL PROTECTION

THE 6th edition of the recommendations of the British X-ray and Radium Protection Committee, lately reprinted in booklet form, contains a new appendix including a section on X-ray examinations under general anæsthesia. The committee has never maintained that there are no risks in radiological work, but it has always held that these can be largely avoided by observance of its 67 recommendations. The booklet is obtainable on application to the hon. secretaries at 32, Welbeck Street, London, W.1. The Medical Research Council has lately set up a Protection Committee as a subcommittee of the Research Committee on the Medical and Biological Applications of Nuclear Physics; the main function of this committee will be to initiate research into new methods of protecting the staffs of establishments now being organised for the large-scale production of radioactive isotopes.

Royal College of Surgeons of England

At a meeting of the council on Nov. 14, with Sir Alfred Webb-Johnson, the president, in the chair, the honorary gold medal of the college was awarded to Sir Alexander Fleming, F.R.S., in appreciation of his distinguished work and particularly in recognition of his discovery of penicillin.

It was reported that the trustees of the Sir Halley Stewart trust had made a grant to the college for a research fellowship, and Mr. H. Fletcher Lunn, anatomical curator, was appointed as the first fellow. Dr. R. J. Last, anatomical curator, was elected as the first Bland-Sutton research scholar.

It was reported that the special trustees had elected Mr. F. H. Masina as a Prophit research student for the investigation of the pathology and treatment of carcinoma of the bladder.

Mr. Alan Perry (London), Sir Heneage Ogilvie (Guy's), and Mr. R. M. Handfield-Jones (St. Mary's) were elected members of the court of examiners. The Hallett prize was awarded to Mr. R. P. Melville, of the University of Sydney. H. K. Ford (Epsom College and the London Hospital) was nominated as the 54th Jenks scholar.

It was decided to hold a meeting of fellows on Friday, Nov. 29, at 5 P.M., to discuss certain aspects of the National Health Service Act.

Mr. Ian Aird, professor of surgery in the British Postgraduate Medical School, was elected ad eundem to the fellowship of the college. Diplomas of membership were granted to the candidates named in THE LANCET of Nov. 9 (p. 701) as having qualified to practise, with the exception of 5 who had previously been granted membership.

Diplomas in medical radiodiagnosis, in medical radiotherapy, and in child health were granted, jointly with the Royal College of Physicians, to the candidates named in THE LANCET of Nov. 9 (p. 701).

Society of Apothecaries

The society's gold medal in therapeutics will be presented to Sir Alexander Fleming, F.R.S., and Sir Howard Florey, F.R.S., on Thursday, Nov. 28, at 8 P.M. The presentation will be followed by a soirée.

Addison Lecture

Prof. E. C. Dodds, F.R.S., will deliver the first Addison lecture at Guy's Hospital on Monday, Dec. 2. His title is Stories of Endocrine Research. Tickets may be had from the secretary of the medical school, Guy's Hospital, London, S.E.1.

Princeton's Bicentenary

Honorary degrees were conferred on Sir Henry Dale, O.M., F.R.S., and Sir John Orr, F.R.S., at the bicentennial celebrations of Princeton University.

Public-health Teaching in Croydon

Last spring the Royal Institute of Public Health and Hygiene arranged that doctors undergoing courses of instruction in preventive medicine should attend for $2^1/_2$ days each week at Croydon, where they gain practical experience of all the departments working under the local authority.

London County Council

At its meeting on Nov. 19 the council appointed Dr. A. A. W. Petrie, the senior medical superintendent in their mental-health services, to be their medical adviser on mental health. Dr. Petrie will be seconded for part of the time from Banstead Hospital to headquarters staff to fulfil his new duties. He succeeds Dr. R. M. Stewart, who has retired.

The Basic Nursing Course

The London County Council have endorsed the resolution adopted by the Association of County Medical Officers of Health providing for a two-tier system of nurses' training with opportunities for advancement from the lower to the upper tier. The resolution which has also been endorsed by the County Councils Association (see *Lancet*, Sept. 28, p. 462) proposes that—

> There should be a basic training of two years for all nurses, some of which period should be spent in nursing the chronic sick. This training should be essentially practical.
>
> After that training, and on passing their appropriate examinations, the designation should be "Qualified Nurse."
>
> A substantial number of nurses should receive further training in order to qualify them for positions of ward sister and higher. The appropriate designations to be selected later.

The L.C.C. are reserving their views on the designations to be used and other details ancillary to the application of the principle.

Medical Sheriffs

Dr. J. Emrys Jenkins has been appointed sheriff for Breconshire, and Dr. E. Wyn Jones sheriff for Caernarvonshire.

Medical Society of London

The Lloyd Roberts lecture will be delivered on Monday, Dec. 16, at 8.30 P.M., by Sir James Chadwick, F.R.S., who is to speak on Atomic Energy.

Mass Radiography in Tasmania

The Tasmanian government proposes, with the help of mobile mass-radiography units, to have the chest of every civilian radiographed periodically—possibly once in every five years.

Edinburgh University Club of London

A reception is to be held at the May Fair Hotel, W.1, on Thursday, Dec. 5, from 6.30 to 8 P.M., in honour of Sir John Fraser, the principal. The hon. secretary is Dr. Bruce Williamson, 12, Wimpole Street, W.1.

London University Conservatives

Dr. W. J. O'Donovan has been appointed provisional chairman of the University of London Conservative and Unionist Graduates' Association, which is to hold its first post-war meeting at 11 A.M. on Saturday, Nov. 30, at King's College, Strand, W.C.2.

Congress of School and University Hygiene

This congress is to be held in Paris from June 25 to 29, 1947, under the auspices of the ministries of national education and of public health. At the congress the Société Française d'Hygiène Scolaire will propose the formation of an international association to be charged with the organisation of periodical congresses and the establishment of liaison between doctors engaged in this branch of medicine. The secretary-general of the congress is Dr. Pierre Delthil, 46, Rue de Naples, Paris, 8e.

International Congress of Military Medicine and Pharmacy

At the invitation of the Swiss Government the eleventh congress is to be held at Basle from June 2 to 7, 1947. The principal subjects for discussion are the resuscitation of the wounded, the prophylaxis of epidemics, methods of determining the concentration of hydrogen ions, the evacuation of casualties, and the contribution of the medical officer to the morale and physique of soldiers.

Contact Lens Society

The society, which is open to both medical and non-medical membership, has been formed, under the presidency of Prof. Ida Mann, for the study of contact lens work in all its aspects. The joint secretaries are Mr. A. G. Cross and Mr. G. H. Giles, to whom inquiries should be directed at 65, Brook Street, London, W.1. The first scientific meeting will be held there at 5.30 P.M. on Jan. 20.

More Scientists Needed in the United States

It will take five or more years to make up the shortage in scientists created by the war, according to Dr. Thomas Parran, surgeon-general of the United States Public Health Service. The federal government is offering fellowships to encourage doctors to engage in medical research.

B.C.G. in U.S.S.R.

A member of the tuberculosis institute of the Medical Academy of the U.S.S.R. has informed British United Press that in the past two decades about 3 million babies have been immunised against tuberculosis with vaccine of the Calmette type. Good results are also claimed with older children and adolescents; and it is stated that in protected children the incidence of tuberculosis is only a third of the incidence in children before B.C.G. vaccination was used.

Nobel Awards

The first half of the Nobel chemistry prize has been awarded to J. B. Sumner, of Cornell University, for his discovery of the crystallisability of enzymes; the second half has been awarded jointly to W. M. Stanley and J. H. Northrop, both of the Rockefeller Institute for Medical Research, Princeton, for researches into the purified production of enzymes and virus proteins.

Prescriber and Dispenser

The National Health Service Act means a 99·9% separation of dispensing from the hands of the prescriber, according to Mr. Thomas Reid, a member of the Pharmaceutical Society's council. No longer, he says, will the doctor's chauffeur, or any other unskilled person, act as a dispenser. "My own prophecy is that under the new health service the doctor will again become a competent writer of prescriptions."

Association of Industrial Medical Officers

At a meeting of the Scottish group, to be held in the Institute of Hygiene, Glasgow University, at 3 P.M. on Wednesday, Dec. 11, Prof. T. Ferguson and assistants will give a symposium on Occupational Medicine. Medical practitioners are invite to attend.

Welfare Foods

Potassium iodide is to be added to the vitamin A and tablets made for issue to expectant mothers. Each tabl will now contain potassium iodide 0·13 mg., vitamin 4000 I.U., vitamin D 800 I.U., and calcium phosphate *B.* 250 mg. In future the Ministry of Food cod-liver oil *will b* "cold-cleared," so as to improve its appearance and remove its tendency to cloud in cold weather.

New Fracture Bed

A new type of bed for patients with multiple fractures has been devised by Howard Hughes, an American pilot, who wa recently admitted to a Los Angeles hospital with multipl fractures, and burns prohibiting the application of plaster The bed has a "spinal" mattress, divided into six independen sections, each 5 in. square; these are mounted on screw-jacks worked by cranks within easy reach of the patient, who, by adjusting them, can raise or lower the sections, so that th spine is brought into any desired curvature.

Return to Practice

The Central Medical War Committee announces that th following have resumed civilian practice:

Dr. F. DUDLEY HART, 152, Harley Street, W.1 (Tel.: Welbeck 6919).
Mr. J. STEWART HESLOP, F.R.C.S., 8, St. John Street, Manchester, 3 (Tel.: Blackfriars 2166).
Dr. H. EVERLEY JONES, O.B.E., 11, Park Road West, Wolverhampton.
Dr. JOHN S. PARKINSON, 10, St. John Street, Manchester, 3 (Tel.: Blackfriars 4311).
Dr. J. GRAHAM SCOTT, 11, Wexford Avenue, Johannesburg, S. Africa.

Academician Nikolai Anichkov was last month elected president of the Soviet Academy of Medical Sciences, following the retirement of Academician Nikolai Burdenko, who has since died.

Mr. Kenneth Carter, M.P.S., has been appointed secretary of the Therapeutic Research Corporation of Great Britain.

Messrs. Burroughs Wellcome & Co. have opened an office at 18, Merrion Square, Dublin.

Births, Marriages, and Deaths

BIRTHS

BULLEID.—On Nov. 8, at Midsomer Norton, the wife of Dr. A. H. Bulleid—twin daughters.
BUTLER.—On Nov. 10, the wife of Flight-Lieutenant Kenneth Butler, M.B.—a son.
EVANS.—On Nov. 10, in London, the wife of Dr. M. L. H. Evans—a son.
EXNER.—On Nov. 10, the wife of Dr. G. G. Exner—a daughter.
GLAISHER.—On Nov. 4, the wife of Dr. C. Glaisher—a daughter.
HINDS HOWELL.—On Nov. 13, in London, the wife of Dr. A. Hinds Howell—a daughter.
HOVENDEN.—On Nov. 9, the wife of Dr. T. G. Hovenden—a daughter.
LANGTON-LOCKTON.—On Nov. 12, the wife of Dr. Philip Langton-Lockton—a daughter.
MANSON-BAHR.—On Nov. 8, at Nairobi, Kenya, the wife of Dr. P. E. C. Manson-Bahr—a son.
MARSHALL.—On Nov. 14, at Carshalton, the wife of Dr. T. S. Marshall—a son.
WYLIE.—On Nov. 14, the wife of Squadron-Leader W. D. Wylie, M.R.C.P.—a son.

MARRIAGES

WHYTE—CARRINGTON-WARD.—At Karachi, India, Lieut.-Colonel D. G. C. Whyte, D.S.O., R.A.M.C., to Patricia Carrington-Ward.

DEATHS

ALLAN.—On Nov. 7, Flying-Officer Charles King Allan, M.B. Glasg., aged 23.
BOLTON.—On Nov. 12, at Beaconsfield, Joseph Shaw Bolton, D.SC., M.D. Lond., F.R.C.P.
BROWNLIE.—On Nov. 12, at Edinburgh, James Law Brownlie, M.D. Glasg., M.R.C.P.E., D.P.H., F.R.S.E.
DANIELL.—On Nov. 10, at Brighton, Edgar Percy Daniell, M.R.C.S., aged 86.
GWYNNE-JONES.—On Nov. 15, Howell Gwynne-Jones, C.V.O., M.R.C.S.
LOMAS.—On Nov. 15, in London, Henry Lomas, M.D. Vienna, M.R.C.S., D.P.H.
LYNDON.—On Nov. 14, Arnold Lyndon, O.B.E., M.D. Lond., of Grayshott, Hindhead, Surrey, aged 85.
MURRAY.—On Nov. 13, at Wokingham, John Gawler Murray, L.R.F.P.S., aged 78.
ROBERTS.—On Nov. 12, at Oakshott, Harry Roberts, L.M.S.S.A., aged 75.
SULLY.—In November, at Durban, South Africa, Albert Max Sully, M.R.C.S., aged 81.

CARDIAC SIGNS IN YOUNG ADULTS

WITH SPECIAL REFERENCE TO FUNCTIONAL MURMURS *

GEOFFREY BOURNE
M.D. Lond., F.R.C.P.
PHYSICIAN IN CHARGE OF CARDIOGRAPHIC DEPARTMENT,
ST. BARTHOLOMEW'S HOSPITAL, LONDON

DURING the last six years I have examined a large number of young adults cardiologically at the request of three medical boards. This paper is based on a careful analysis of about a quarter of them, 308 in all, of whom 224 had normal hearts and 84 organic heart disease.

The cases were selected by the boards, which contained different medical practitioners. The extent and type of this selection clearly varied from board to board, and from doctor to doctor; so the results described are no criterion of the distribution of cases in the normal population. It is probably true, however, that the recruits referred provided a good indication of the type of case suspected by a doctor of having some cardiac abnormality.

I made a full clinical examination, followed by radiography in the anteroposterior and the right and left oblique positions. Where the pulmonary conus seemed to be unusually prominent, a barium swallow was also done, and the size of the left auricle thus carefully checked. An electrocardiogram was not taken as a routine, since it was early found that it yielded little additional information except in selected cases.

When the hearts of young people are examined, various conclusions may be reached:

(1) The heart is found to be perfectly normal both functionally and physically.

(2) A normal physical state is associated with cardiac symptoms.

(3) Though function is perfect, signs of disease are present.

(4) Both function and the physical state are clearly deficient.

The first and fourth of these possibilities do not raise any question as to the state of the heart.

The second group contains people with what is usually known as effort syndrome. Here there are definite symptoms, the most common of which are apparently due to excessive sensitivity of the heart both on the sensory and the motor side. Certain other symptoms and signs are also present which have no direct association with the heart. In effort syndrome palpitation, fatigue, and shortness of breath follow an amount of exertion which does not produce them in normal people. Further, symptoms of nervousness, sweating, and giddiness, probably of vasomotor origin, are frequent. The sweating is usually a cold sweat, affecting the body locally rather than generally. It is seen particularly in the axillæ, on the palms of the hands, and on the forehead, and is excessive. The heart in such cases is often clearly normal, except that its abnormal response to exercise and emotion easily provokes tachycardia. Vasomotor signs resulting from postural change are common, a raised pulse-rate and a lowered blood-pressure following the change in position from the horizontal to the vertical.

In the third group—a large one—signs suggesting some cardiac abnormality are present without any symptoms. This is the group in which diagnosis is often difficult but which is from the point of view of the State very important because admission to the Services or to any pensionable position is likely to involve expense, if a person with organic heart disease is accepted. These slight abnormalities, or suspected abnormalities, are the basis of this paper. They fall into certain well-defined clinical groups.

SIZE OF HEART

In the investigation of a cardiac patient the size of the heart is the most important single fact. If the heart is enlarged, it must be regarded as diseased, whether such disease is past or present. If the heart is normal in size, it may be concluded, especially in the young, that disease is probably absent. If the heart is of the small longitudinal type, well below the average, no organic disease is present.

In many excited but healthy young adults the position of the apex-beat is deceptive. This, especially in athletic individuals, is often so forcible that its position seems to be in the midclavicular line or external to it. Here accurate radiography is the only means of determining whether the heart is enlarged or not. There are two methods—a film taken at a distance of 6 ft., or measurement by orthodiagram. Of the two, the orthodiagram is probably more accurate, since it is possible to measure the heart either in systole or in diastole as desired. The commonest method is to define the outer border of the heart in diastole, both to the left and to the right, and to measure the interior diameter of the thorax on both sides at the end of an easy inspiration. The vigorously beating heart above described is found by such measurement not to be enlarged, in spite of the apparently abnormal position of the apex-beat.

HEART SOUNDS

The heart sounds described below were present in every case in young adults whose hearts were regarded as normal both clinically and radiologically, and whose blood-pressure was within normal limits. (Such functional or physiological murmurs and unusual sounds may also, of course, coexist with the murmurs of organic valvular disease.)

The heart sounds introduce many difficulties into diagnosis. Abnormalities occur in the first and second normal heart sounds, and in the presence sometimes of a physiological third heart sound. Furthermore, murmurs and adventitious sounds are very common, and these in their turn present problems.

The *first heart sound* is often muffled or impure, particularly when it is loud and when the heart is beating excitably or vigorously. It may occasionally be reduplicated. The most important single point about the first heart sound is its musical pitch. When the first heart sound is loud but low-pitched it is normal, and when the pitch is raised, approximating more to the quality of the second sound, there is suspicion of abnormality.

The *second sound* is chiefly investigated at the base of the heart. Reduplication is present fairly frequently at the pulmonary base, and is of no special significance. Such reduplication may vary with respiration, chiefly appearing during inspiration.

The *third sound* is a physiological phenomenon, but it is not very easily heard and is only present in a small proportion of cases—about 15% of my 308 cases. It is audible at the apex and is a single distant sound. It is heard after the second sound, which it follows at the same interval in any particular case. It is often more audible in the left lateral position and in the last half of expiration. It is apt to disappear during inspiration. It is more easily heard when the heart is beating slowly.

This sound is important, for it may be loosely described as a mid-diastolic murmur and may suggest mitral stenosis. The points to be emphasised are that the sound is short and detached, and that it is associated with no presystolic murmur and with no distant diastolic rumble. Moreover the first sound is of normal pitch, whereas in mitral stenosis the pitch is raised. Radiography of such patients commonly reveals a heart which is rather small than large, in which there is no increase in the size of the pulmonary conus. The third heart sound may also be heard in diseased hearts, particularly where there is ventricular dilatation secondary to hyperpiesis; in some cases of mitral stenosis; and in patients with an early stage of heart-block. In the first of these examples the additional sound is probably related to the first sound and not to the second. It has been found to coincide with auricular systole. In mitral stenosis the diastolic murmur may suggest a third heart sound, but there is usually a definite underlying distant diastolic rumble also, especially in the left lateral position. After the *first stage of heart-block, where the P–R interval is* prolonged, auricular systole may in this way become unusually audible. It is clear that the cases of third heart sound described above belong to none of these three groups.

---

* Read to the Torquay Medical Society on March 21, 1946.

MURMURS

Various murmurs and abnormal signs may give rise to difficulty in diagnosis.

Systolic Murmur.—The systolic murmur heard at the pulmonary base alone is not very frequent. There were only 6 examples in the 224 normal cases of the present series. But a systolic murmur at the pulmonary base conducted down the left border of the sternum to the apex is common, and the series contains 36 examples (16%). This murmur may be associated with a sensation which gives to the examining hand almost the impression of a systolic thrill, but radiography shows a perfectly normal heart, with no increase in size of the pulmonary conus. This murmur is louder when the subject is lying down and may be present only in this position. If, when the stethoscope is placed first at the apex (so that the apical systolic murmur is the first to be heard), the pulmonary systolic part of the murmur is louder than that heard at the apex, the murmur is unlikely to be organic in origin. The possibility of organic disease diminishes in proportion to the number of these functional murmurs present.

A systolic murmur heard at the apex alone is also common, with 25 (11%) in this series. The murmur was not conducted, and frequently was absent when the patient was standing, and often it disappeared during full inspiration.

The third systolic murmur of importance was that heard at the apex and heard even more loudly towards the axilla during inspiration only. There were 23 examples (10%) in the series. During expiration this murmur disappears, and it is therefore called a cardio-inspiratory systolic murmur. It is common in persons who also show a systolic pulmonary murmur conducted to the apex. No enlargement or radiological abnormality was found in these patients, who often had a heart of the narrow longitudinal type, obviously not organically diseased.

Exocardial Murmur.—Another common adventitious sound can be described as an exocardial murmur or rub. There were 26 cases (11%). Whether this label "exocardial" has any basis in fact is impossible to determine. One patient, however, produced some evidence suggesting this explanation; for there was a shuffling murmur which corresponded with all of the heart's movements—systole and diastole of the ventricles and systole of the auricles producing *a triple* shuffling sound. This is exactly analogous to what may be heard in pericarditis, where the sound is definitely exocardial. But in the present case the shuffling sound was eliminated by inspiration and was only heard during the last half of expiration and the beginning of inspiration. Moreover, radiography showed the heart to be perfectly normal in size and shape, and there were no symptoms indicating any diminution in normal cardiac function. This exceptional case is only of importance as presenting evidence for the exocardial basis of these murmurs.

The commonest exocardial murmur is that which is heard most loudly in the fourth space to the *left of the* sternum, and close to it. The sound is conducted to some extent towards the apex and to some extent towards the pulmonary base. There is no associated thrill and no enlargement of the heart, and as a rule the sound eliminated *during full inspiration. In about a quarter* the cases showing a harsh exocardial sound this is prese only at the pulmonary base. Though the murmur usually a loud rather harsh shuffle, occasionally the is a definite musical squeak, which also disappears o *full inspiration.*

These are the murmurs of greatest importance whic are found in normal young adults. They suggest variou organic lesions and have to be differentiated from then

DIFFERENTIAL DIAGNOSIS

The systolic murmurs must be differentiated from th murmur of mitral regurgitation. This murmur is hear both on standing and on lying down, though it is ofte louder on lying down. It is also not affected by respir tion. Further, in mitral regurgitation there is usuall some enlargement of the heart, and the character of th first sound may vary, being raised in pitch.

The systolic murmurs at the pulmonary base are common, especially when conducted to the apex, th they are unlikely to cause difficulty. When the murm *is restricted to the pulmonary base, the question of a* organic congenital defect may arise. Some of thes murmurs may indeed be due to a very minor lesion the pulmonary valve; but a diagnosis is impossibl because the interference with the normal circulation is slight as to cause neither symptoms nor signs. There is n cyanosis, clubbing, or enlargement of the right ventricle.

The *harsh exocardial murmurs to the left of the sternu* suggest chronic pericardial disease, but here again th heart is otherwise so normal that this diagnosis is unlikely Another possibility here is a very small patency in th interventricular septum; but in this condition th murmur *should be associated with a thrill and som* enlargement of the heart, and should be heard durin all phases of respiration.

The above murmurs and sounds have been full described because a clear clinical description may b the first step in elucidating clinical problems. Carefu examination is likely to confirm the separate character and qualities of these murmurs, and by separating then from one another some impetus may be given to attempt to define how they individually may be produced. I none of them has any characteristic abnormality bee seen on the X-ray screen. Since an electrocardiogra was not taken in every case, it is just possible that thi form of investigation might be helpful, though th examination of many thousands of normal people i hospital and in private practice has not provided evidenc that this is likely. Since, however, these murmur exist as clinical entities, it is necessary to define them s that their innocence may be clearly understood i individual patients.

BLOOD-PRESSURE

The final diagnostic difficulty which arises in apparently healthy young adults is that associated with the blood-pressure. This is often increased in nervous subjects, and a figure of 180/90 may be noticed. Three points are of importance in determining whether this increase in blood-pressure is nervous or not. The general behaviour of the patient is likely to give a clue to his nervous state. An associated tachycardia is nearly always present when the increase in blood-pressure is due *to nervous causes.* Radiographic measurement of the heart will show no increase whatever in size, as would be the case if hyperpiesis were constantly present. Indeed the heart may be small. The diastolic figure is of far greater importance than the systolic. If it is normal or only slightly raised, the hyperpiesis is unlikely to have an organic cause.

ASSESSMENT OF CARDIOVASCULAR SYSTEM

The most important points in assessing the state of the heart and cardiovascular system in young people are as follows:

(1) Is there any enlargement of the heart? If the heart is normal in size and shape, organic disease is unlikely. If the heart is small, organic disease is almost certainly absent.

(2) Is the first sound of normal or of low pitch? If it is low-pitched, any associated murmurs are unlikely to be due to mitral disease.

(3) Does the murmur disappear either on standing or on lying down, or does it disappear during respiration? Any murmur which disappears in this way is very unlikely to be due to organic disease.

During examination of these 308 subjects the following abnormalities due to organic disease were noticed:

Mitral stenosis (40).
Mitral regurgitation (13).
Mitral stenosis with aortic regurgitation (4).
Aortic regurgitation, almost certainly rheumatic, present alone (7).
Patency of the ductus arteriosus (2).
Patency of the interventricular septum (4).
Transposition of the viscera (1).
Coarctation of the aorta (1).
Enlargement of the heart, radiography showing a cardiac diameter of more than half of the chest diameter. The cause of enlargement not ascertainable (9).

The organic defects were present in these cases without symptoms, and often this was so even though the young man or woman was playing normal games and undertaking normal physical activities.

The murmurs of mitral disease were sometimes heard only when the patient was lying down, and in a few cases only in the left lateral position; and the diastolic murmur of aortic regurgitation was often so distant that it was difficult to detect, and the leak was so small as to cause no change in blood-pressure. On the other hand the congenital murmurs were loud and easy to pick up.

The series contained 9 cases of effort syndrome with characteristic symptoms but an organically normal heart.

SUMMARY

Of 308 Service recruits referred by medical boards for cardiological investigation, 224 had normal hearts and 84 organic heart disease.

Difficulties in diagnosis were mainly due to abnormalities in the first and second sounds, a physiological third sound, and adventitious sounds. These sounds are described and interpreted.

Another difficulty in diagnosis was an increase in blood-pressure in an apparently heathy person.

Suggestions for the assessment of the cardiovascular system are given.

"As we are actually situated today I do not think we can possibly have too great an increase in the amount of intelligence available in our society. . . . I . . . find men of high intellect . . . overpressed and overworked. . . . Yet the fact remains that we could at least in theory breed too many intellectuals. Firstly, in a society made up exclusively of, say, Aldous Huxleys, Laskis, Einsteins, or Stracheys, who would . . . perform the innumerable dull routine services necessary if our life is not to relapse into confusion? Secondly, even if you could get the necessary manual and unpleasant work done by compelling intellectuals to tackle it, this could only be achieved in an atmosphere of discontent and internal stress that would make . . . for revolution and dictatorships and oppression. Thirdly, pure intellect is perhaps not all that it is cracked up to be from the point of view of making the most successful sort of society in this world."—Mr. GEOFFREY ELEY, addressing the Eugenics Society on May 28. (*Eugen. Rev.* October, 1946, p. 133.)

ABSORPTION AND EXCRETION OF WATER

THE ANTIDIURETIC HORMONE

E. B. VERNEY
M.A., M.B.Camb., F.R.C.P., F.R.S.
SHEILD PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF CAMBRIDGE

(*Concluded from p. 744*)

INHIBITION OF WATER DIURESIS BY RISE IN OSMOTIC PRESSURE OF CAROTID PLASMA

The hypothesis that water diuresis is conditioned by an inhibition of secretion of antidiuretic substance by the neurohypophysis implies a prior governance of this secretion by the osmotic pressure of the arterial plasma. It was of interest, therefore, to determine the effects of a rise in the osmotic pressure of the carotid plasma on the secretion of the kidney during water diuresis.

Dogs have been used exclusively in this work. They were perineotomised to facilitate catheterisation, and each common carotid artery was exteriorised as a "carotid loop" (Van Leersum 1911). In the formation of the loop, two parallel incisions are made through the skin along the course of the carotid, the artery is enfolded within the strip of skin by suturing its edges behind the artery, and finally the outer edges of the skin incisions are approximated by a row of sutures deep to the tunnel of skin through which the carotid artery is now passing. During this surgical procedure the carotid sinus has sometimes been denervated, sometimes not. The animals were trained to lie quietly on their right side for long periods, and during an experiment the urine was collected continuously into a series of graduated glass tubes. The solutions for injection were carefully filtered and sterilised beforehand, and the injections were made under aseptic conditions as uniformly as possible with the aid of a beating metronome.

Effect of Intracarotid Injections of Hypertonic Solutions of NaCl.—It was first necessary to see whether intracarotid injection of isotonic solutions at different temperatures and intravenous injections of hypertonic solutions produced any effect on the course of urine flow. They were found not to do so. When, however, hypertonic solutions were injected into the carotid, definite inhibitory responses were observed (fig. 15). The magnitude of the response varied with the tonicity of the solution at constant rate and period of injection and with the period of the injection at constant volume and tonicity of solution.

Disappearance of Effect after Removal of Posterior Lobe.—The shape of these responses suggested that they were of pituitary origin, and this hypothesis was put to the test of experiment by measuring the responses to a given injection before and after removal of the posterior lobe. Fig. 16 shows that the response to 21 c.cm. of 2·50% NaCl injected into the right carotid in 20 sec. equates closely with the response to 1·0 mU of postpituitary extract injected intravenously, whereas the response to the same intracarotid injection after removal of the posterior lobe is very much reduced in size. It is, therefore, a valid procedure to assay the responses in terms of postpituitary extract; and, when this is done, it is found that the response to a given intracarotid injection is diminished by some 90% as the result of removal of the posterior lobe. It will be recollected that the response to emotional stress suffered a similar reduction in magnitude as the result of a similar procedure. No difference was detected between the response to an intravenous and that to an intracarotid injection of postpituitary extract.

Effect of Short-period Injections is Osmotically Determined.—It now became of interest to inquire whether it was indeed the increase in the osmotic pressure of the plasma which was operative in eliciting the response to intracarotid injections, and to this end comparison was made of the effects of isosmotic solutions of NaCl and

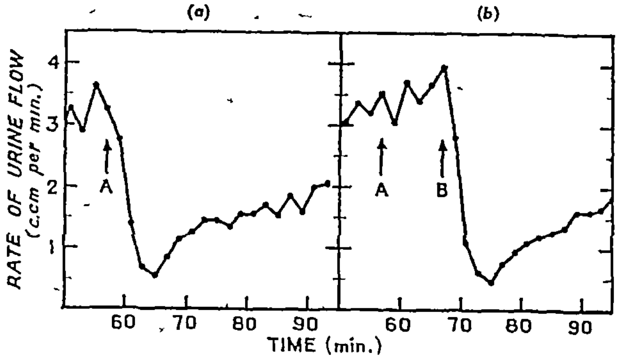


Fig. 15—Inhibitory response to intracarotid injection of hypertonic solution: (a) at A, injection of 10 5 c.cm. of 1 50% NaCl into left carotid in 9 sec.; (b) at B, injection of 11 0 c.cm. of 1·50% NaCl into right carotid in 13 sec.

dextrose. Fig. 17 shows three responses: to 10 c.cm. of 2·50% NaCl injected in 12 sec.; to 10 c.cm. of 15·4% dextrose injected in 11 sec.; and to 2·0 c.cm. of 8% NaCl injected in 10 sec., the volume and strength of this last solution being such as were calculated, at an estimated carotid blood-flow of 2·5 c.cm./sec., to produce about the same increase in osmotic pressure as the two isosmotic solutions. The three responses are indistinguishable and are all assayed at 2·5 mU. The response, therefore, is due not specifically to NaCl but to the rise in osmotic pressure.

The osmoreceptors,‡ wherever they may be, do not accommodate during short-period exposure to a rise in the osmotic pressure of the carotid plasma produced by NaCl, doubling the period of exposure to the same rise causing the release of at least double the quantity of antidiuretic substance. This lack of accommodation would be expected on the view that the osmoreceptors are continually engaged in controlling the antidiuretic function of the pituitary.

Effect of Intracarotid Infusions of Hypertonic Solutions of NaCl, and its Quantitative Assessment in Terms of Postpituitary Extract.—I will now refer to the results of longer periods of exposure to smaller increases in osmotic pressure. The infusions of the solutions of NaCl were made by means of a synchronous motor connected by reduction gearing to the head of a micrometer screw whic moved forward the plunger of the all-glass syringe wit which the fine infusing needle was connected. It wa first necessary to determine the course of the aortic blood-chloride during the infusion of a hypertonic solution (1) the left carotid artery, and (2) the malleolar vein. Chloride determinations on samples of blood from the right carotid artery taken at intervals during the 10-min period of such infusion showed that the aortic blood-chloride followed exactly the same course, irrespective of whether the infusion was made into the left carotid artery or into the malleolar vein. So far, therefore, as the effects of an increase in the aortic blood-chloride are concerned, intravenous infusions may be used a controls of intracarotid infusions.

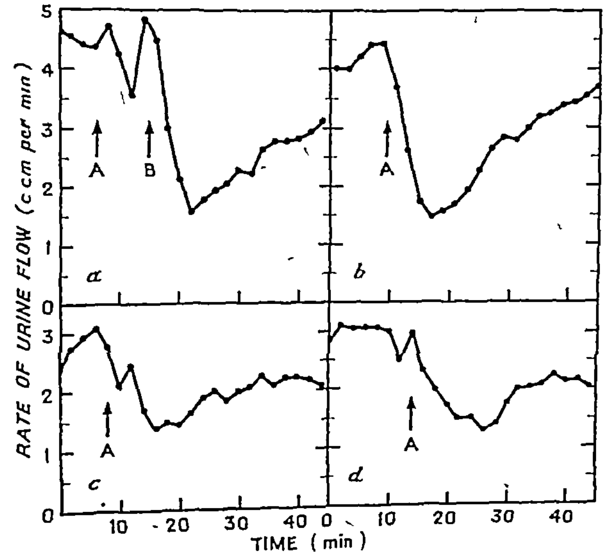


Fig. 16—Responses to injections: *a* and *b* 5 days before, *c* and *d* 11 days after, removal of posterior lobe of pituitary. *a*: at B, injection of 21 c.cm. of 2 50% NaCl into right carotid in 20 sec.; *b*: at A, 1·0 mU of postpituitary extract injected intravenously in 15 sec.; *c*: at A, injection of 21 c.cm. of 2 50% NaCl into right carotid in 20 sec.; *d*: at A, 0·1 mU postpituitary extract injected intravenously in 20 sec.

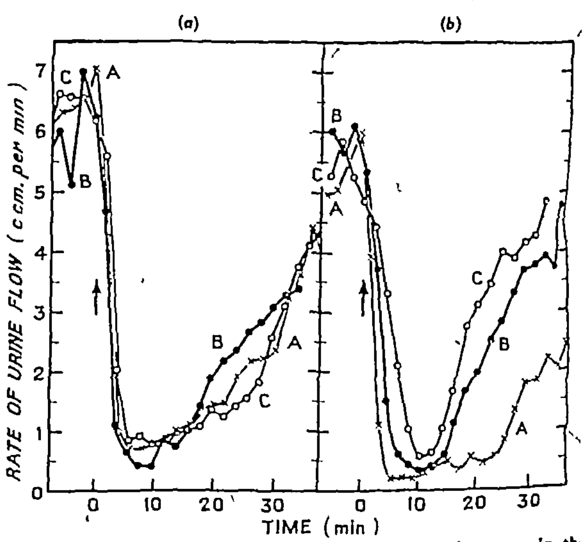


Fig. 17—Similarity between responses to equivalent increases in the osmotic pressure of the carotid plasma: (*a*) at the arrow 10·0 c.cm of 2 50% NaCl was injected into the right carotid in 12 sec. (graph A) 10·0 c.cm. of 15 4% dextrose in 11 sec. (graph B); and 2·0 c.cm. o 8·00% NaCl in 10 sec. (graph C); (*b*) at the arrow postpituitar extract 3 0 mU was injected into the malleolar vein (graph A), 2·0 m (graph B), and 1 0 mU (graph C).

Now, it was found that, when an infusion of NaC was made into the carotid over a period of 10 min., th urine flow was inhibited earlier than when the sam infusion was made into the malleolar vein; and tha as the strength of the infused solution was reduced, thi difference became greater. The cause of the earlie onset of the inhibition when the infusion was made int the carotid artery must be attributed to the increase i osmotic pressure of the blood in the vascular bed supplie by the carotid over and above that of the aortic blood Experiments were then performed in which NaCl wa infused over periods of 40 min. at the slow rate of 0 33 mg of NaCl per sec. (fig. 18). The infusion into the carot was accompanied by a gradual fall in urine flow fro 6·0 to 0·5 c.cm./min., at which level the flow was persistin when the infusion was stopped. The *flow* then slowl increased to reach a rate of nearly 4 c.cm./min. thirty minutes later. The responses to intravenous infusion o the same *solution of NaCl without* added postpituitary extract, and with increasing additions of this substance are also shown in fig. 18; and the response to the intra carotid infusion is assayed as equivalent to that of an intravenous infusion of 1 µU of postpituitary extract per sec. ($0{\cdot}5\times10^{-9}$ g./sec. in terms of the standard powder). This, then, may be regarded as the rate at which the antidiuretic *substance* is being continuously secreted in the non-hydrated dog, a figure which agrees well with the results of Shannon's (1942) experiments on replacement therapy in the dog with diabetes insipidus. The carotid blood-flow of the animal *to which* fig. 18 relates is probably about 2·5 c.cm./sec. On this assump-

---

‡ The term "osmoreceptors" is used without prejudice to any specific permeability which they may later be shown to exhibit to their ionic and molecular environment.

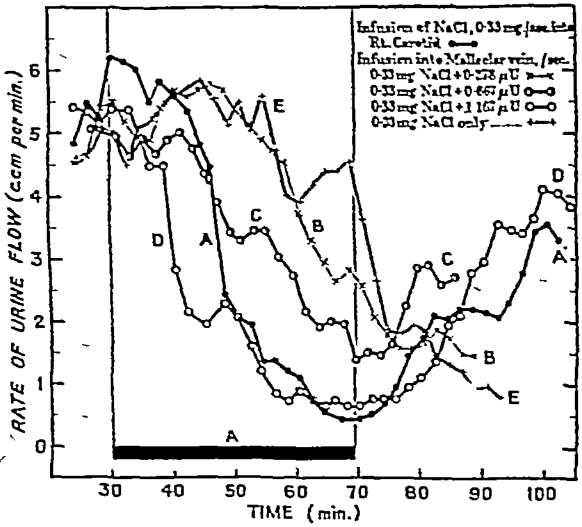


Fig. 18—Effect of prolonged infusion of NaCl into the carotid, and the method of its assay. The black rectangle covers the period of the infusions.

tion the increase in blood-chloride to which the osmoreceptors are responding and causing the pituitary to secrete 1 µU per sec. is 8 mg./100 c.cm., or, in terms of the resultant increase of osmotic pressure in the water phase of the blood, 96 mm. Hg—i.e., an increase of less than 2%. This change in blood-chloride is well within the range of the falls reported in water diuresis in man—Priestley (1921) found a fall of 35 mg./100 c.cm. of venous blood—and the smallness of the figure gains additional interest when it is recollected that the carotid infusion was unilateral.

HORMONAL CHARACTERISATION OF POSTPITUITARY ANTIDIURETIC SUBSTANCE

The recovery of urine flow when the intracarotid infusion is stopped shows that the secretion of pituitary antidiuretic substance is being inhibited by the fall in blood-chloride and consequent depression of activity in the osmoreceptors. The progression of this recovery is to be attributed to the gradual destruction in the kidney, and perhaps in the blood, of the quantity of antidiuretic substance which was maintaining the secretion of urine at a non-diuretic level. The latent period between the peak of the water-load curve and the maximal rate of urine secretion, to which I referred earlier and promised to return, is to be attributed to the same process, as indeed was foreseen at the time that work was done. Water diuresis, then, may be fitly and accurately described as a condition of physiological diabetes insipidus; and there can be little doubt that the antidiuretic secretion of the neurohypophysis is a hormone in the physiological sense, its liberation being continuously governed by the contemporary concentration of chloride, and possibly of other osmotically active substances, in the arterial plasma.

The presence of osmoreceptors connected by nerve paths with the pituitary was postulated by Klisiecki et al. (1933), who gave also references to earlier work on water diuresis. Their apprehension has now become justified; their localisation is for future inquiry. We do not yet know whether the osmoreceptors lie in the vascular bed —e.g., the supra-optic nucleus—supplied by the internal carotid artery or in that supplied by the external; they are not in the carotid sinus. Should the site of the receptors become experimentally definable, one may predict the possibility of developing a suitable technique for their exposure in the non-diuretic animal to a local *fall* in osmotic pressure, and so of producing a condition of diabetes insipidus which, in its experimental reversibility, would exhibit the attribute which theory demands.

POSTSCRIPT

Since this lecture was delivered, short-period (10 sec.) intracarotid injections of hypertonic solutions of sucrose have been found to release approximately the same amount of the antidiuretic hormone as do similar injections of isosmotic solutions of NaCl and of dextrose. A similar injection of an isosmotic solution of urea is, however, entirely without action. Moreover, long-period (40 min.) intracarotid infusion of dextrose, producing a local increase in blood-sugar of some 80 mg./100 c.cm. and the same increase in osmotic pressure as does the NaCl in the experiment illustrated in fig. 18, has no apparent influence on the course of water diuresis. It appears that, as judged within the compass of these periods, the osmoreceptors are freely permeable to urea, less freely permeable to dextrose, and relatively impermeable to sodium chloride. Further, in connexion with the localisation of the osmoreceptors, it has been found in the one animal to which the test has so far been applied that the antidiuretic response to an intracarotid injection of a hypertonic solution of NaCl vanishes as the result of ligation of the *internal* carotid artery.

REFERENCES

Aschner, B. (1912) *Pflüg. Arch. ges. Physiol.* 146, 1.
Farini, F. (1913) *Gaz. Osped.* no. 109, cited from abstract in *Wien. klin. Wschr.* 26, 1867.
Fisher, C., Ingram, W. R., Ranson, S. W. (1938) Diabetes Insipidus and the Neuro-Hormonal Control of Water Balance, Ann Arbor.
Frank, E. (1912) *Berl. klin. Wschr.* 49, 393.
Gemelli, A. (1908) *Arch. ital. Biol.* 50, 157.
Howell, W. H. (1898) *J. exp. Med.* 3, 245.
Klisiecki, A., Pickford, M., Rothschild, P., Verney, E. B. (1933) *Proc. roy. Soc.* B, 112, 496.
O'Connor, W. J., Verney, E. B. (1942) *Quart. J. exp. Physiol.* 31, 393.
— — (1945) *Ibid*, 33, 77.
Oliver, G., Schäfer, E. A. (1895) *J. Physiol.* 18, 277.
Petersen, H. (1936) *Z. Biol.* 97, 378.
Pickford, M. (1939) *J. Physiol.* 95, 226.
Priestley, J. G. (1921) *Ibid*, 55, 305.
Ranson, S. W., Fisher, C., Ingram, W. R. (1938) *Res. publ. Ass. nerv. ment. Dis.* 17.
Rein, H. (1928) *Z. Biol.* 87, 394.
— (1929a) *Ibid*, 89, 195.
— (1929b) *Handb. biol. ArbMeth.* Abt. 5, Teil 8, p. 693.
— (1931) *Ergebn. Physiol.* 32, 28.
Rydin, H., Verney, E. B. (1938) *Quart. J. exp. Physiol.* 31, 393.
Schäfer, E. A. (1909) *Proc. roy. Soc.* B, 81, 442.
—, Herring, P. T. (1906) *Philos. Trans.* B, 199, 1.
—, Magnus, R. (1901) *J. Physiol.* 27, ix.
— Vincent, S. (1899) *Ibid*, 25, 87.
Shannon, J. A. (1942) *J. exp. Med.* 76, 371.
Starling, E. H., Verney, E. B. (1925) *Proc. roy. Soc.* B, 97, 321.
Van Leersum, E. C. (1911) *Pflüg. Arch. ges. Physiol.* 142, 377.
Vassale, G., Sacchi, E. (1892) *Riv. sper. Freniat.* 18, 525.
Verney, E. B. (1926) *Proc. roy. Soc.* B, 99, 487.
— Starling, E. H. (1922) *J. Physiol.* 56, 353.
Von den Velden, R. (1913) *Berl. klin. Wschr.* 50, 2083.

ORAL PENICILLIN IN GONORRHŒA

S. R. M. Bushby
M.Sc. Brist.
OF THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES, BECKENHAM

A. H. Harkness
M.R.C.S.
MEDICAL OFFICER IN CHARGE OF VENEREAL DISEASES DEPARTMENT, ST. PETER'S HOSPITAL, LONDON

It was early observed by Abraham et al. (1941) that the dose of penicillin clinically effective parenterally was ineffective orally, and that the proportion of oral penicillin recovered in the urine was low compared with that of parenteral. Penicillin being unstable at low pH, its destruction in the stomach was assumed to play an important part; and the later discovery of the production of penicillinase by coliform organisms seemed to justify the view that the antibiotic could not be effective by mouth (Chain and Florey 1944).

The largely theoretical concept of destruction of penicillin by gastric juice has been thoroughly investigated.

Cutting et al. (1945) made extensive tests with enteric coatings and concluded that a resin-cellulose plastic was superior to all others, but they also incorporated acid-neutralising buffers.

Burke et al. (1945) used a double gelatin capsule hardened in formaldehyde and alcohol and gave prior treatment with aluminium hydroxide.

György et al. (1945) used sodium citrate as a buffer, and Charney et al. (1945) showed that after the *oral administration* of penicillin with sodium citrate, especially after meals, the amount of penicillin excreted in the urine was increased.

McDermott et al. (1945) combined penicillin with peanut oil as a protection against acid.

TABLE I—SERUM-PENICILLIN LEVELS AFTER ADMINISTRATION OF SINGLE DOSES OF UNCOATED AND ENTERIC-COATED TABLETS

Volunteer	Dose of penicillin (I.U.)	Tablet	Serum-penicillin level (I.U./ml.) at hours after administration			
			0·5	1·5	3·0	5·0
A	40,000	Uncoated	0·06	0·125	0·03	0·02
		Coated	<0·02	<0·02	0·12	<0·02
B	40,000	Uncoated	0·04	0·2	0·03	<0·02
		Coated	<0·02	<0·02	0·03	<0·02
C	60,000	Uncoated	0·04	0·08	0·04	<0·02
		Coated	<0·02	<0·02	0·04	<0·02
D	60,000	Uncoated	0·04	0·16	0·08	<0·02
		Coated	<0·02	<0·02	<0·02	<0·02
E	60,000	Uncoated	0·06	0·2	0·04	<0·02
		Coated	<0·02	<0·02	0·08	<0·02
F	60,000	Uncoated	0·12	0·12	0·16	<0·02
		Coated	<0·02	<0·02	0·08	<0·02

Most authors claim some advantage for their adjuvant, but Bunn et al. (1945), after a trial of antacids and suspensions in oil and beeswax, could find no instance in which their effect was superior to that obtained with penicillin either in capsule or dissolved in saline.

The present position is summed up by Finland et al. (1945), who conclude that penicillin in water gives as good results as when taken with buffers or stabilisers, though aluminium hydroxide may have a slight adjuvant effect. It seems, however, of paramount importance for penicillin in water to be taken before meals.

In the absence of experimental evidence derived from penicillin absorption and excretion-balance experiments in man, two further possibilities should be considered. Free et al. (1945) believe penicillin to be destroyed in the tissues. A contrast is drawn between the sudden flooding of the blood-stream after intravenous or intramuscular injection and the continuous entry into the circulation after oral administration. The other possibility is that penicillin is slowly and incompletely absorbed. If this is true, there may be unexpected advantages in the oral route in the case of highly susceptible organisms located in tissue other than blood.

In infections due to the gonococcus or to the pneumococcus, both of which are known to be extremely sensitive to penicillin (Ross et al. 1945), a good deal of evidence exists that penicillin may be administered effectively by mouth provided the dose is adequate.

György et al. (1945) treated successfully 18 cases of gonorrhœa in adult males, 5 cases of gonococcal vulvovaginitis in children, and 3 cases of gonococcal conjunctivitis in infants with penicillin by mouth in doses varying from 10,000 units three-hourly or four-hourly in children to 15,000–40,000 units three-hourly in adults for two or three days. In 3 further cases of gonococcal vulvovaginitis there was a relapse after three courses of the same dosage, but permanent cures followed the same dosage given intramuscularly.

Finland et al. (1945) report 7 failures in the treatment of 61 cases of acute gonorrhœa, using a total dosage varying between 120,000 and 800,000 units given hourly or two-hourly.

Ross et al. (1945) treated successfully 8 cases of gonococcal vulvovaginitis in children with four doses each of 100,000 units three-hourly. In a preliminary trial there were failures with two doses and three doses each of 100,000 units.

Cutting et al. (1945) reported 11 failures in the treatment of 53 cases of gonorrhœa. In 4 of the failures the patients had each received doses of 25,000 units, with a total dosage of 250,000 units, and in the remaining 7 failures the patients had each received doses of 50,000 units, with a total dosage of 500,000 units.

Free et al. (1945) treated 14 cases of gonorrhœa with 1,600,000 units in two days (100,000 units two-hourly during the waking period); there were no failures.

Bohls et al. (1946) treated 10 cases of gonorrhœa with one oral dose of 100,000 units, with 4 failures; 15 with a single dose of 200,000 units, with 1 failure; 13 with 100,000 units twice daily for two days, with 3 failures; and 36 with 200,000 units twice daily, with 1 failure.

The present report concerns 62 cases of gonorrhœa treated orally with six doses of penicillin 40,000 I.U. and sodium citrate 1 g. three-hourly. After single doses of 40,000 or 60,000 units (2 or 3 tablets each containing calcium penicillin 20,000 I.U. with sodium citrate 0·5 g.) taken an hour after breakfast, estimates were made at intervals on volunteers. Food, consisting of bread and butter and tea, was taken about two hours after the penicillin, and a light lunch two hours later. The resulting concentrations are shown in table I. When given in uncoated tablets penicillin appeared in the blood within 30 min., reached a peak in about 1½ hours, and was undetectable at 5½ hours. When given in tablets coated with a multilayer enteric coating of proved efficiency penicillin did not appear in the blood until after 2½ hours, and was undetectable at 5½ hours. Only 11 patients received coated tablets.

DETERMINATION OF PENICILLIN IN BLOOD

The usual methods for determining penicillin in blood serum will not detect quantities less than 0·02 unit per ml. American workers (cited by Suchet 1945) consider that lower levels than this are therapeutically effective in gonorrhœa; this may be true, for many organisms are definitely sensitive to lower levels when tested in vitro with suitable bacteriological media.

The limiting factor is the need to dilute the serum to make it a suitable medium for the growth of the test organism. Attempts to increase the sensitivity of the estimation by using the gonococcus for this purpose failed, since it grows feebly in 50% serum, and any increase in sensitivity which is gained is defeated by the need for higher dilutions. We have found Fleming's (1943) slide technique an easy and convenient method for small quantities. It avoids the need for absolutely sterile samples, as neat serum and red cells do not readily grow the ordinary contaminants, though readily allowing the growth of the test organism—a virulent hæmolytic streptococcus.

The neat blood does, however, slightly decrease the antibiotic action of the penicillin; hence levels below 0·02 unit per ml. cannot be detected. Abraham and Duthie (1946) found that penicillin was most active at pH 6·5, and by increasing the hydrogen-ion concentration of the blood we have attempted, unsuccessfully, to increase the sensitivity of Fleming's method.

PRELIMINARY OBSERVATIONS

Preliminary observations were made on patients with acute gonorrhœa treated with penicillin 40,000 units and sodium citrate 1 g. at various intervals and for various periods. There was a good response in 6 patients receiving six doses four-hourly and 6 receiving five doses four-hourly. Among 10 patients receiving four doses three-hourly and 4 patients receiving three doses four-hourly there was 1 failure in each group; both responded well to a second course of six doses three-hourly. These clinical observations suggested to us that twelve hours was too short a period of treatment, and four hours too long an interval between doses; so we decided to treat further cases (62 in all) with six doses three-hourly.

The serum-penicillin levels were determined in 53 cases. Considerable variations were found before each dose, not only from patient to patient but also in the same patient. Examples are shown in table II.

TYPE OF CASE

In this series we treated a total of 85 adult males (84 with gonorrhœa and 1 with primary anorectal gonococcal infection) and 3 adult females (1 with urethritis and cervicitis and 2 with cervicitis only). Of these 88 cases 40 were sulphonamide-resistant, of which 2 were complicated by acute epididymitis, 1 by acute prostatitis, and 3 (2 males and 1 female) had not responded to intramuscular injections of penicillin administered elsewhere. Of these latter, 1 male had had one injection of 150,000 units in peanut oil and the other had had five daily doses of 100,000 units each; the female had had one injection of 200,000 units in peanut oil and beeswax, and, owing to failure, had had a similar dose five days later. To facilitate the taking of blood two-hourly in certain patients, 42 were admitted to hospital for twelve hours and 46 continued with their usual occupations. Fluids were restricted to $1^1/_2$ pints during treatment, and there was usually at least an hour's interval between the taking of tablets and solid food. Urination took place two-hourly, immediately after the taking of smears and cultures.

CLINICAL OBSERVATIONS

A feeling of well-being during treatment was observed (as it is after parenteral administration) in many of our cases; we attribute this to the elimination of a gonococcal bacteræmia.

The gonorrhœal discharge, often more profuse 2–6 hours after the start of treatment, became progressively less during treatment; in a few cases it disappeared entirely. In a large proportion of cases the creamy discharge at the fourth hour became mucopurulent, and at each subsequent examination more mucoid, persisting as such until 2–5 days after the last dose of penicillin. Residual non-gonococcal urethritis (more frequent in sulphonamide-resistant cases) in most cases was due, as it is with parenteral penicillin, to resolution processes in gonococcal lesions, such as soft infiltrations and infections of glandular tissues. Pre-existing lesions of the urinary tract may also be a cause of persistence of non-gonococcal urethritis. This was so in one of our cases in which a discharge was present until the fourteenth day, when urethroscopy revealed a stricture of the urethra due to a previous attack of gonorrhœa.

TABLE II—SERUM-PENICILLIN LEVELS (I.U./ML.) IN PATIENTS RECEIVING BY MOUTH PENICILLIN 40,000 UNITS AND SODIUM CITRATE 1 G. THREE-HOURLY FOR SIX DOSES

Case	2*	4	6	8	10	12	14	16
	2†	1	3	2	1	3	2	1
1	<0·02 +	0·04 +	<0·02 −	<0·02 −	0·16 −	0·02 −	0·02 −	0·12 −
2	<0·02 +	<0·02 +	0·02 −	<0·02 −	<0·02 −	<0·02 −	<0·02 −	0·06 −
3	<0·02 +	0·04 +	<0·02 +	<0·02 −	0·04 −	<0·02 −	<0·02 −	<0·02 −
4	<0·02 +	0·04 −	<0·02 −	<0·02 −	0·04 −	<0·02 −	<0·02 −	0·02 −
5	<0·02 +	0·03 +	0·10 −	0·02 −	<0·02 −	<0·02 −	<0·02 −	0·04 −
6	0·02 −	<0·02 −	<0·02 −	0·04 −	<0·02 −	<0·02 −	<0·02 −	0·08 −
7	<0·02 +	<0·02 +	<0·02 +	<0·02 −	0·04 −	0·02 −	0·02 −	0·04 −
8	0·12 +	0·06 +	0·04 +	0·04 −	0·02 −	0·16 −	0·02 −	0·02 −
9	<0·02 +	0·04 +	0·02 +	0·02 −	0·12 −	0·02 −	<0·02 −	0·04 −
10	<0·02 +	0·02 +	0·02 +	<0·02 −	0·02 −	<0·02 −	0·02 −	0·04 −
11	0·02 +	0·16 +	.. +	0·12 −	<0·02 −	0·06 −	<0·02 −	<0·02 −
12	<0·02 +	0·04 +	<0·02 +	<0·02 −	0·02 −	<0·02 −	<0·02 −	0·02 −
13	<0·02 +	<0·02 −	<0·02 −	<0·02 −	<0·02 −	<0·02 −	0·02 −	0·02 −
14	<0·02 +	<0·02 +	<0·02 −	<0·02 −	<0·02 −	<0·02 −	0·02 −	0·02 −
15	<0·02 −	0·02 −	<0·02 −	0·04 −	0·04 −	<0·02 −	0·08 −	0·08 −

* These figures indicate hours after start of treatment.
† These figures indicate hours after last dose of penicillin.
+ = Gonococci in films of discharge.
− = No gonococci in films.

Primary mixed infections due to both the gonococcus and non-specific organisms are also occasionally responsible for residual non-gonococcal urethritis. Penicillin is effective in destroying the gonococcus but usually does not benefit non-specific infections. One such patient (who admitted masturbation) developed an acute non-specific epididymitis four days after the completion of treatment.

The *urine*, in recent infections, still contained a few mucous threads in the first glass after completion of treatment, but in some of the older infections, especially sulphonamide failures with gross involvement of the posterior urethra, it was still muddy, or clear, with heavy threads, usually in one glass, but on four occasions in two glasses. The persistence of a mucoid non-gonococcal discharge did not often indicate the condition of the urine, as in many such cases the first morning specimen was clear, with no threads. Threads in the urine were often present for a week and sometimes for longer periods, and would no doubt have disappeared more rapidly with a few urethrovesical irrigations, withheld entirely in this series for fear of masking gonococcal relapse.

Dysuria, noted in 39 cases before the start of treatment, invariably disappeared during treatment, but in 4 cases (2 associated with painful erections, no discharge, and clear urine with no threads) it persisted two days and may have been due to restriction of fluids during penicillin therapy. The early clinical cure in the cases with painful erections was considered to be explained by the fact that resolution was taking place in structures —e.g., corpora cavernosa—isolated from the urethra.

TOXIC MANIFESTATIONS

An urticarial eruption developed in one patient two hours after the fifth dose. The sixth dose was taken, and the patient was not seen by one of us until four hours later, when there was swelling of hands, feet, and neck, and a generalised papular urticaria. Ephedrine gr. $^1/_2$ was given six-hourly, and the skin returned to normal in thirty-six hours. Before the administration of oral penicillin the patient had been treated elsewhere with several courses of sulphonamides and was said to have had, a week before seeing us, a daily injection of penicillin 100,000 units for five days. This we rather doubted, as the urethral discharge had not improved. A patch test carried out two months after completion of treatment was completely negative. This patient was reinfected a fortnight after the patch test, and no toxic manifestations were observed with a repeated course of oral penicillin.

BACTERIOLOGICAL EXAMINATIONS

Smears of the urethral discharge were examined every two hours during treatment in most cases. Giant forms of gonococci (first observed by one of us in January, 1944) were present in all cases at two hours, usually at four hours, and occasionally at six hours (their delay in disappearance being invariably associated with the use of coated tablets), when they were detected only after a thorough search. Gonococci, normal in size and shape, were also seen in most cases at two hours and often at four hours. Cultures were carried out two-hourly in many cases, but the gonococcus was not grown after smears had become negative. The rate of elimination did not appear to be related to the blood-penicillin level (table II), and the invariable presence of giant forms in smears taken two hours after the start of treatment showed that penicillin was present in the discharge at that time. The presence of giant forms in smears did not indicate that viable gonococci were no longer present in the secretions, since cultures in such cases were occasionally positive. Cultures were positive in several cases up to six hours, when coated tablets were given, after the start of treatment but never later, in spite of the presence in smears of an occasional giant form. It is an easy matter to overlook giant forms at and after the sixth hour, as they may stain very lightly and, when engulfed in degenerated polymorphs, may be mistaken for a portion of the nucleus.

TESTS FOR CURE

Our investigations began in February, 1946, and a large majority of our cases have been under observation five or six months, none less than two months. During the first fortnight examinations were carried out thrice weekly, and subsequently weekly. All patients were requested to refrain from micturating for at least three hours before each visit, when smears and cultures were taken and the condition of the urine assessed by the two-glass test.

No instrumentation or rectal investigations were carried out until fourteen days had elapsed, when in all cases there was no discharge and the urine was clear, with no threads, at which stage tests for cure were made. Anterior urethroscopy was performed. Smears and cultures after massage of prostate, vesiculæ seminales, and Cowper's glands were made on two occasions at an interval of a week. At least one of the examinations took place before the first morning micturition and usually followed the anterior urethroscopy. Other than the detection of 1 case of urethral stricture, these tests were negative in all cases. The Wassermann and Kahn reactions were negative in all cases, and the gonococcal complement-fixation reaction was positive in 8; 3 of these became negative during the period of observation, the others remaining persistent positives. The significance of these latter has been discussed elsewhere (Harkness 1944 and 1945) and is due, in our opinion, to delay in the start of treatment or to previous long-standing infection. All the failures and reinfections had negative reactions.

On completion of the above-mentioned tests the taking of alcohol was permitted, and during the subsequent observation periods of weekly examinations the Wassermann and Kahn tests were repeated on several occasions in view of the dangers of a concomitantly acquired syphilis.

FAILURES AND REINFECTIONS

In all there were 4 failures and 2 reinfections. There were 2 relapses (twenty-four hours after three doses of 40,000 units four-hourly, and forty-eight hours after four doses of 40,000 units three-hourly) during the preliminary observations, when the minimal effective amount of oral penicillin was being studied. The 2 other failures (our only failures in 62 cases receiving six doses of 40,000 units three-hourly) could be attributed to maladministration on the part of the patients. One was a labourer who had previously been resistant to one injection of 150,000 units in peanut oil and beeswax and a five-day course of sulphathiazole 1 g. six-hourly and who, owing to a misunderstanding of our orders, took large amounts of fluids during his oral penicillin course. The other was a young man who did not take the tablets at the proper intervals. Cure in both these cases was effected by a second course; the dose was, however, probably needlessly increased to 60,000 units. The case of epididymitis which developed four days after completion of treatment, when there was no discharge and the urine was clear, with no threads, was considered to be due to the effects of trauma by masturbation on a recently inflamed urogenital tract with a mild residual non-gonococcal infection. A laboratory report of the centrifuged deposit of urine showed only an occasional leucocyte, and cultures were sterile. The reinfections occurred in 2 males (who admitted exposure without protection two and three days before the onset of urethritis) a month and two and a half months after cures had been effected with six doses of 40,000 uni three-hourly; both were again successfully treated wi the same dosage.

DISCUSSION

The practical demonstration of the efficiency of o penicillin emphasises the importance of dosage. T first assumption following the demonstration that mo was required was that much was destroyed, but rece evidence gives less and less support to the theory gastric or penicillinase destruction. Our own eviden that the only effect of an enteric coating of prov efficiency was to delay the arrival of penicillin in t blood-stream gives no support to the theory of destructi in the stomach. There remains the theory of destructi in the tissues. We believe the evidence of renal clearan following intravenous and intramuscular exhibiti to obscure the field; more diffuse penicillin penetrati in tissues other than blood may well follow the slow absorption of oral penicillin. That penicillin absorpti from the gut is slow and probably incomplete is t explanation we favour.

There were 2 failures in our 62 cases treated for fiftee hours with 240,000 units (40,000 units at three-hourl intervals), a relapse-rate comparing very favourabl with our work and the work of others with parenter penicillin. An analysis of our estimates of serum penicillin levels shows the levels to have been generall at or under 0·02 unit throughout the course of trea ment. This level is lower than that quoted as essenti to success by some authorities. Thus Jones et a (1945) consider that a high percentage of cure cannot b obtained unless the serum inhibition is present in dilution of not less than 1 in 8 and is maintained for nin and a half hours; but their published figures do n support this view. This degree of serum inhibitio would necessitate a concentration of 0·08 unit per ml. and, even though most of our cases had levels higher tha this during treatment, the average level was lowe On the other hand, some American workers maintai that blood-penicillin levels undetectable by laborator methods are clinically efficient, and Allan (1946) is of th opinion that a demonstrable amount of penicillin in th blood need not be maintained so long as hitherto believe necessary, nor that the level need be high. Perhap further study of different serum-penicillin levels main tained for different lengths of time will explain thi discrepancy. Jones et al. (1945) believe 0·08 unit fo nine and a half hours to be essential; we maintained level of about 0·02 unit for about fifteen hours. Ou figures support the view that lower serum-penicilli levels maintained for a longer time may be effective since we had 2 failures in 14 cases receiving nine hours treatment, and only 2 failures in 62 cases receivin fifteen hours' treatment. Again, the presence of gian forms of gonococci before penicillin has been detecte is evidence of antibiotic activity at low serum-penicilli levels.

Non-gonococcal urethritis persists for various period with equal frequency, after successful oral and parentera penicillin therapy, but in our opinion it occurs mor often than after successful sulphonamide therapy. Adjuvant treatment, consisting of urethrovesical irrigations, would have been helpful in aiding resolution in some of our cases and is recommended, but it was withheld for fear of masking gonococcal relapse.

The minimum of interference until fourteen days after the disappearance of gonococci from the secretions is a wise precaution, as trauma due to instrumentation and prostatovesicular massage may precipitate local or metastatic non-gonococcal complications; in one of our cases epididymitis followed masturbation.

Oral administration of penicillin incorporated in sodium citrate is recommended for the treatment of gonorrhœa. It is necessary, however, to give a word of warning on the importance of regular dosage during the fifteen hours' course; otherwise failure may sometimes follow, as it does with sulphonamide therapy. Short concise instructions should be given verbally and in writing to each patient. The course of treatment has the advantage that the drug is taken only during fifteen normal waking hours.

SUMMARY

Of 62 cases treated for fifteen hours with six doses each of penicillin 40,000 units and sodium citrate 1 g. given by mouth, a total of 240,000 units, 2 cases relapsed.

This rate compares favourably with our experience of parenteral therapy.

It is important to keep strictly to the regular dosage schedule and the restriction of fluids to 1½ pints during the course.

We are indebted to Dr. P. Lamb, of St. Peter's Hospital, and to Mr. A. E. Day and Mr. J. Croxford, male nurses at St. Charles's Hospital, for their collaboration; and Messrs. Burroughs Wellcome & Co. for supplying the tablets, each containing calcium penicillin 20,000 I.U. and sodium citrate *0·5 g.*

REFERENCES

Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A. (1941) *Lancet* ii, 177.
— Duthie, E. S. (1946) *Ibid*, i, 455.
Allan, A. (1946) *Brit. med. J.* i, 314.
Bohls, S. W., Cook, E. B. M., Potter, R. T. (1946) *Vener. Dis. Inform.* 27, 69.
Bunn, P. A., McDermott, W., Hadley, S. J., Carter, A. C. (1945) *J. Amer. med. Ass.* 129, 320.
Burke, F. G., Ross, S., Strauss, C. (1945) *Ibid*, 128, 83.
Chain, E., Florey, H. W. (1944) *Brit. med. Bull.* 2, 5.
Charney, J., Alburn, H. E., Bernhart, F. W. (1945) *Science*, 101, 251.
Cutting, W. C., Halpern, R. M., Sultan, E. H., Armstrong, C. D., Collins, C. L. (1945) *J. Amer. med. Ass.* 129, 425.
Finland, M., Meads, M., Ory, E. M. (1945) *Ibid*, p. 315.
Fleming, A. (1943) *Lancet*, ii, 434.
Free, A. H., Huffman, L. F., Trattner, H. R., Brown, H. B. (1945) *J. Lab. clin. Med.* 30, 738.
György, P., Vandegrift, H. N., Elias, W., Collo, L. G., Barry, F. M., Pilcher, J. D. (1945) *J. Amer. med. Ass.* 127, 639.
Harkness, A. H. (1944) *Brit. J. vener. Dis.* 20, 81, 139.
— (1945) *Ibid*, 21, 45.
Jones, T. R. L., Maitland, F. G., Allen, S. J. (1945) *Lancet*, i, 368.
McDermott, W., Bunn, P. A., Benoit, M., Dubois, R., Haynes, W. (1945) *Science*, 101, 228.
Ross, S., Burke, F. G., McLendon, P. A. (1945) *J. Amer. med. Ass.* 129, 327.
Suchet, J. (1945) *Brit. J. vener. Dis.* 21, 78.

HÆMOPOIETIC RESPONSE TO FOLIC ACID IN PERNICIOUS ANÆMIA

THE STERNAL-MARROW CHANGES

R. J. HARRISON
M.R.C.P.

J. C. WHITE
M.B. Birm.

From the Departments of Medicine and Pathology, British Postgraduate Medical School, Hammersmith

THIS paper describes the results of folic-acid therapy in a case of pernicious anæmia, with particular reference to the sternal-marrow changes. Consideration of one case obviously does not justify full assessment of the value of folic acid in the treatment of pernicious anæmia, but the observations on hæmopoiesis are of interest.

The range of hæmopoietic substances affecting the human bone-marrow has recently been extended. The hæmopoietic principle of liver, effective in very highly concentrated form in restoring the megaloblastic hæmopoiesis of uncomplicated Addisonian pernicious anæmia to normoblastic form, does not always abolish the similar megaloblastic picture which may accompany tropical or non-tropical sprue. Less highly refined and concentrated liver extracts given parenterally, or proteolysed liver or yeast extract by mouth, are often effective however, substances other than the hæmopoietic principle of liver or Castle's intrinsic factor (Castle et al. 1930) presumably being involved. The successful treatment of nutritional macrocytic anæmia with autolysed yeast extract has been attributed by Wills (1945) and Wills and Evans (1938) to a substance distinct from the extrinsic factor.

Darby and Jones (1945) and Darby et al. (1946) have reported from America that synthetic folic acid has successfully abolished or reduced megaloblastic hæmopoiesis in non-tropical sprue, with restoration of a normal blood picture. Spies (1946a) has obtained a good hæmopoietic response to folic acid, with reversal of megaloblastic hæmopoiesis, in macrocytic anæmias, including nutritional macrocytic anæmia, pellagra, uncomplicated Addisonian pernicious anæmia, macrocytic anæmia of pregnancy, and sprue.

A link is provided between the megaloblastic hyperplasia of the marrow in sprue and Addisonian pernicious anæmia, besides other megaloblastic anæmias, in that synthetic folic acid, which appears to be distinct from the hæmopoietic principle of the liver, may restore normoblastic hæmopoiesis in all these conditions. With reference to the multiple-factor hypothesis of Jacobson and SubbaRow (1937) regarding the nature of the hæmopoietic principle, folic acid also appears to be distinct from their "primary factor," which is a liver fraction active in very small amounts, especially in the presence of accessory substances. The use of folic acid in sprue by Darby and Jones (1945) and Darby et al. (1946) was the outcome of observations on the similarity between human sprue syndrome and vitamin-M deficiency in rhesus monkeys described by Day et al. (1935). This deficiency condition, accompanied by severe anæmia, leucopenia, and diarrhœa, could be prevented by giving dried brewer's yeast or liver extract, and Day et al. (1945) found *Lactobacillus casei* factor to be curative. This factor is also necessary for normal growth and hæmoglobin formation in chicks.

The *L. casei* factor had been described by Snell and Peterson (1940) as "norite eluate factor," extractable from yeast and liver, and an essential growth factor for *L. casei*. A growth factor for *Strep. lactis*, isolated by Mitchell et al. (1941) from spinach and called folic acid, was found to be widely distributed in vegetable and animal tissues. Many observers noted similarities between the properties and activities of *L. casei* factor and folic acid from various sources, and Pfiffner et al. (1943) isolated a crystalline folic-acid substance from liver with growth-promoting activity for *L. casei* and *Strep. lactis*. SubbaRow et al. (1945) finally synthesised a folic acid identical with the natural *L. casei* factor from liver.

It is this synthetic folic acid or *L. casei* factor which has been used therapeutically in man, and its structural formula, with two alternative modes of synthesis, has been published by Angier et al. (1946). The substance contains pteridyl, *p*-aminobenzoyl, and glutamic-acid groups. The extent of the natural group of substances to which synthetic folic acid belongs is not yet known. Pfiffner et al. (1945) isolated a crystalline vitamin-B_c conjugate from yeast with anti-anæmic potency for the chick but very little microbiological growth-promoting activity. They suggest that further work may reveal the relationship of several compounds—e.g., the human nutritional factor of Wills (1931) in yeast—to this crystalline factor. Darby et al. (1946) suggest the term "*vitamin-M group*" to designate substances related to folic acid and *L. casei* factor with hæmopoietic activity for primates.

Recent American work suggests that the pyrimidine base, thymine, which is identical with synthetic 5-methyl uracil (Jones 1920), may have a hæmopoietic activity similar to that of folic acid. Snell and Mitchell (1941) and Stokstad (1941) showed that thymine could be substituted for folic-acid substance as the growth factor for *L. casei*, provided substances such as adenine were present. Stokes (1944) found the bacterial cells grown with thymine to contain no folic acid; great excess of thymine is required as a substitute for folic acid, and he suggests that folic acid is a coenzyme for the synthesis of thymine or similar substances required for

TABLE I—PERIPHERAL BLOOD PICTURE BEFORE THERAPY

Time	Red cells (millions per c.mm.)	Hb (% Haden)	Hb (g./100 c.cm.)	Colour-index	Reticulocytes (%)	White cells (per c.mm.)	Polymorphs (per c.mm.)
On admission* ..	0·9	24	3·74	1·33	—	2600	2002
2nd day†	0·84	20	3·12	1·19	0·2	—	—
3rd day‡	0·68	21	3·28	1·54	0·3	1900	1235

* 1 normoblast and 1 intermediate erythroblast per 100 white cells.
† P.C.V. 9·2 c.cm. %; M.C.H. 48·2 γγ; M.C.V. 135·3 c.μ; M.C.H.C. 35·6 %; E.S.R. (Wintrobe) 55 mm. after 1 hour; corrected E.S.R. <1 mm.
‡ Blood-platelets 105,000 per c.mm.

the synthesis of nucleic acids. Spies (1946b) has substituted synthetic thymine for folic acid in the treatment of tropical sprue and Spies et al. (1946) of pernicious anæmia; hæmopoietic response has been obtained, but the dosage required is large (15 g. a day). Berry and Spies (1946) have recently reviewed the present status of folic acid and substances with related action.

The case to be described here has been treated by the oral administration of synthetic folic acid.

CASE-RECORD

A man, aged 63, was admitted to hospital on June 4, 1946, with six months' history of weakness, anorexia, and loss of weight. He had lost 16 lb. The skin of his face and hands had become darker; for two months there had been progressive dyspnœa on exertion.

He had been given six 1 c.cm. injections of a liver extract without improvement; the liver preparation used was six years old.

His diet before his illness had been high in carbohydrate, with deficiencies in vitamins A, B complex, and C. On admission he was placed on a hospital ward diet omitting liver, kidneys, and sweetbreads.

There was nothing relevant in past or family history.

On Examination.—Cheerful, coöperative, and emaciated. Weight 103 lb. Height 5 ft. 2 in. No orthopnœa, but dyspnœa on slight exertion. Skin of face and hands pigmented; mucosæ pale, no pigmentation. Hair grey. Temperature normal. Tongue moist, pale, with smooth surface and atrophic papillæ. Spleen just palpable. Jugular venous pressure 2 cm. above sternal angle. Resting pulse-rate 100 per min. Blood-pressure 120/45. Heart not enlarged; no added sounds. No abnormal neurological signs.

Fractional Test-meal.—Histamine-fast achlorhydria.

Neutral-red Test-meal.—No neutral red in any of the specimens of gastric juice.

Gastroscopy June 29 (Mr. Avery Jones).—Anterior wall and fundus showed gross mucosal atrophy, these changes less marked on posterior wall and not present on antrum.

Radiography.—Barium meal showed smooth mucosa, with few rugæ.

Urine.—Schlesinger's test for urobilin was strongly positive on admission, and from the fourth day of treatment onwards weakly positive.

Plasma icteric on admission. Plasma bilirubin less than 0·5 mg. per 100 c.cm. two days after start of folic-acid therapy; 1 mg. per 100 c.cm. six weeks later; less than 0·5 mg. per 100 c.cm. nine weeks from start. Direct van den Bergh consistently negative.

Hæmatological Investigations.—The peripheral blood picture before therapy is given in table I.

Blood films showed anisocytosis of the erythrocytes, with a preponderance of ovoid rather large cells and occasional very large macrocytes. There was very little anisochromasia or polychromasia. Poikilocytosis was quite frequent. The nucleated red cells present were normoblasts or intermediate erythroblasts. The neutrophil polymorphs sometimes showed excessive segmentation of the nucleus.

Sternal puncture was performed shortly after admission, and films and sections of the marrow indicated very advanced megaloblastic hyperplasia, with abnormalities in the granulocytic series leading to the formation of giant metamyelocytes and proleucocytes (table II). Hæmocytoblasts were numerous (2·2%), and the early members of red-cell and granulocytic [illegible]ies were increased. The nucleated red cells were predomi[illegible]ly members of the abnormal megaloblastic series, and all stages of hæmoglobinisation were observed. Occasio mitoses were seen, and were practically confined to t megaloblasts. There was considerable pleomorphism of t megaloblasts, and giant forms were seen with multiple nuc and moderately advanced hæmoglobinisation of the cytopla (fig. 2). The sections showed a sheet-like cellular hyperplas with obliteration of fat-spaces, and the very numero elements with basophilic cytoplasm were seen to be islets megaloblasts developing near hæmocytoblasts (fig. 1).

Therapy.—Oral treatment with folic acid was give 20 mg. was administered on each of the first two days, follow by 10 mg. daily for six days.

On the day following the start of therapy the patien general condition deteriorated, he became mentally co fused and disoriented, and showed signs of increasing co gestive cardiac failure. Jugular venous pressure 10 c above sternal angle, blood-pressure 90/50 mm. Hg. A slo drip transfusion of 250 c.cm. of packed red cells was giv carefully for six hours, followed by distinct improvement. further 250 c.cm. of packed red cells was given next da The general condition was now much improved, and t jugular venous pressure was not raised above the stern angle, blood-pressure being 110/60 mm. Hg.

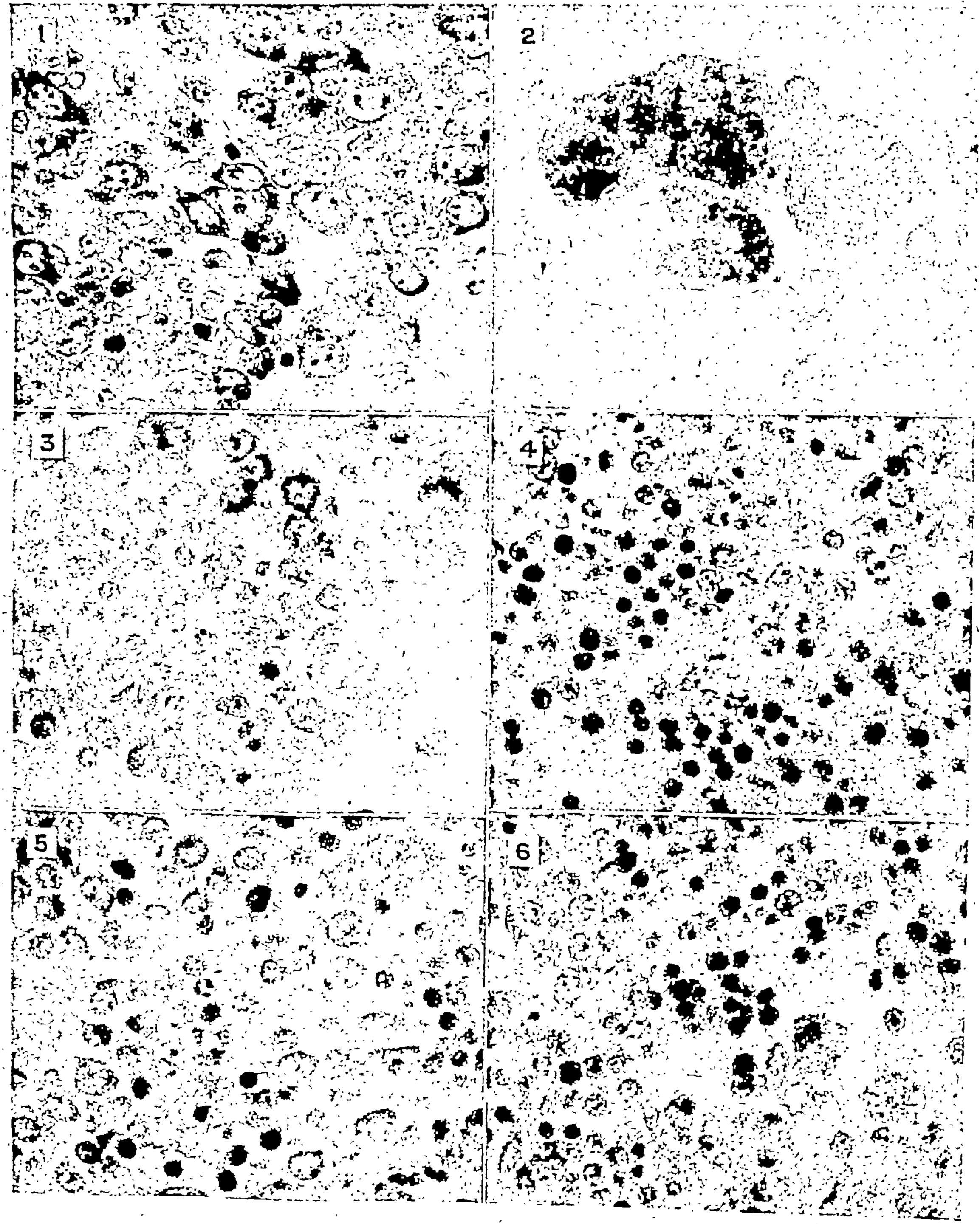
The hæmatological response to therapy was good, and t peripheral blood changes are shown in fig. 7. A reticulocy response of 3·4% began on the fourth day and reached maximum of 27·6% on the sixth day. A rapid rise in t red-cell count and Hb levels was accompanied by a gradu return of the leucocytes to within normal limits.

The qualitative and quantitative changes in the sterna marrow picture are shown in table II. Early changes we apparent twenty-four hours after the start of folic-ac

TABLE II—MYELOGRAMS BEFORE, DURING, AND AFTER THERAP

Cell types	Percentage of cell types (from counts of 500 cells)					
	Shortly after admission	Days from start of 1st course of folic acid			19 days from start of 2nd course of folic acid	6 day from start of 3rd course of folic acid
		1 day	10 days	16 days		
Reticulum cells ..	0·6	1·0	—	0·4	0·6	—
Hæmocytoblasts ..	2·2	1·8	0·4	0·4	1·0	0·2
Myeloblasts	2·4	1·2	0·4	0·6	1·4	0·2*
Promyelocytes ..	3·4	0·6	0·8	0·8	1·4	2·4*
Myelocytes	6·6	6·0	5·8	4·0	8·2	4·6*
N. metamyelocytes ..	2·2	5·4	9·4	4·4	5·4	9·6*
Giant n. metamyelocytes	1·8	0·8	—	0·2	1·2	—*
E. metamyelocytes ..	1·8	1·8	0·2	0·4	1·0	0·6*
N. proleucocytes ..	7·8	10·8	11·6	5·2	9·2	15·4*
Giant n. proleucocytes	10·2	2·6	—	—	1·2	—*
E. proleucocytes ..	0·8	2·4	1·0	0·8	0·6	0·6*
N. leucocytes ..	14·0	14·6	20·8	45·0	20·6	11·4*
E. leucocytes	2·2	1·8	1·8	0·8	0·8	1·8*
B. leucocytes	—	—	—	0·6	1·0	0·8*
Total immature granulocytes (to metamyelocytic stage) ..	18·2	15·8	17·0	10·4	18·6	18·4
Promonocytes and monocytes ..	—	—	2·2	0·2	0·8	0·4
Plasma cells	0·4	0·2	—	—	0·4	0·2
Lymphocytes ..	28·6	13·8	20·4	25·6	29 4	25·2
Total white cells ..	82·6	64·0	75·2	88·6	82·6	73·2
Proerythroblasts ..	1·6	3·6	—	1·0	0·4	0·6†
Early erythroblasts ..	—	3·8	1·6	1·8	3·4	1·2†
Intermediate erythroblasts	—	0·4	6·4	3·2	3·8	6·6†
Late erythroblasts ..	—	0·2	8·6	2·6	2·6	9·6†
Normoblasts	0·2	2·2	5·8	1·6	2·2	6·6†
Macronormoblasts ..	0·8	2·0	1·2	—	0·2	0·4†
Early megaloblasts ..	2·2	6·2	—	—	—	—†
Intermediate megaloblasts	3·6	6·0	—	—	0·6	—†
Late megaloblasts ..	3·4	4·4	—	0·4	1·2	—†
Erythroblasts in mitosis	—	1·0	0·6	—	0·2	0·2†
Megaloblasts in mitosis	0·2	1·0	—	—	—	—†
Amitosis of megaloblasts	—	0·4	—	—	—	—†
Total nucleated red cells	12·8	33·2	24·2	10·6	14·6	25·4
Unclassified cells ..	1·8	1·8	0·2	—	1·2	1·2
Leucoerythrogenetic ratio	1·42	0·53	0·70	0·08	1·27	0·68

† Red-cell series.



Figs. 1, 2, 3, and 4—Sections and films of marrow from sternal punctures of the case described: fig. 1, section before folic-acid therapy, showing megaloblastic hyperplasia and increase in hæmocytoblasts; fig. 2, giant megaloblast from marrow film before therapy, showing multiple nucleus, with characteristic reticular chromatin pattern, and polychromasic cytoplasm (Jenner-Giemsa stain, × 1150); fig. 3, section twenty-four hours after start of folic-acid therapy, showing appearance similar to that in fig. 1, with aberrant granulopoiesis, and a megaloblast in mitotic division in upper right-hand corner; fig. 4, section nine days after start of folic-acid therapy, showing entirely normoblastic erythropoiesis, with darkly staining nuclei of erythroblasts and normoblasts, and occasional proerythroblasts, and normal granulopoiesis.

Figs. 5 and 6—Sections of sternal marrow from a typical case of pernicious anæmia in relapse, and following successful therapy with purified liver principle ('Anahæmin'), for comparison with figs. 1, 2, and 3: fig. 5, section before therapy (red cells 1,000,000 per c.mm., Hb 25% (Haden)), showing megaloblastic hyperplasia; fig. 6, section six days after parenteral liver therapy (reticulocytes 44%), showing actively normoblastic erythropoiesis.

All sections except fig. 2 × 580. Figs. 1, 3, and 4 fixed in Susa and stained with pyronin-methyl green. Figs. 5 and 6 fixed in methyl alcohol-formol and stained with Delafield's hæmatoxylin and azur-Giemsa (White et al. 1946).

therapy (fig. 3). The significant change was a considerable increase in mitoses in the red-cell series, seen in the earlier members of both normoblastic and megaloblastic series. Some of the mitoses were normal but others were aberrant, with formation of multipolar spindles. Amitotic division of megaloblasts was also observed. Megaloblasts were still very numerous at this time.

After ten days' treatment the megaloblastic series had completely disappeared from the marrow, and the maturation of the *granulocytes* was also entirely normal, no giant bizarre forms of the metamyelocytes and proleucocytes being seen (table II). Mitotic activity was reduced, and the biopsy specimen from the sternal marrow showed intense normoblastic erythropoiesis proceeding normally, though the cellularity of the marrow was still much greater than normal (fig. 4).

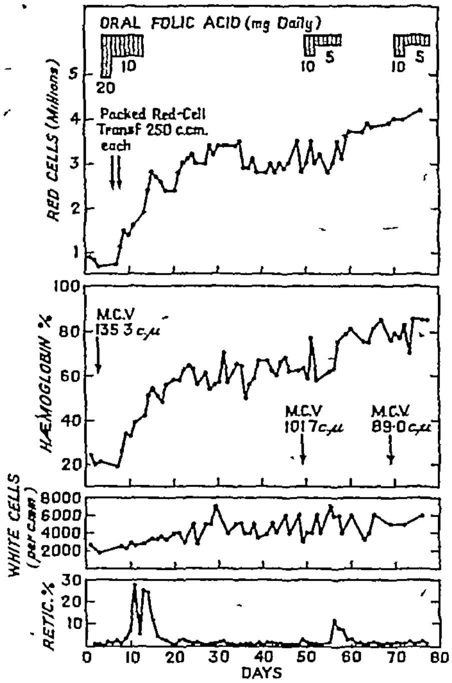


Fig. 7—Peripheral blood changes in response to folic-acid therapy.

A further sternal-marrow examination after 16 days (table II) showed a more normal cellularity, and maintenance of predominantly normoblastic erythropoiesis, but a few late megaloblasts and giant neutrophil metamyelocytes had reappeared.

The peripheral blood picture became stabilised at about 3,000,000 red cells per c.mm. and Hb 60% (Haden) (9·36 g.). The absolute values 44 days after the start of therapy were :

P.C.V. ..	28·5 c.cm. %	M.C.H. ..	34·7γγ
M.C.V. ..	101·7 c.μ	M.C.H.C. ..	34 %
		Reticulocytes	1 %

At this time the serum-bilirubin was 1·0 mg. per 100 c.cm. (*direct van den Bergh negative*), but the urinary Schlesinger test for urobilin was consistently within normal limits, being only weakly positive.

A further course of 50 mg. of oral folic acid was now given (10 mg. daily for two days, followed by 5 mg. daily for six days), leading to a reticulocyte response of 10·6% after five days. On the day following the reticulocyte peak the *patient was put on a high-protein dietary intake of 125 g.* daily.

The blood picture showed further improvement thirteen days after the second reticulocyte peak :

Red cells ..	3,900,000 per c.mm.	M.C.H. ..	30·4γγ
Hb	76 % (Haden) (11·6 g.)	M.C.H.C. ..	34·2 %
Colour-index ..	0·97	White cells ..	5000 per c.mm.
P.C.V.	34·7 c.cm. %	Reticulocytes	0·1 %
M.C.V.	89·0 c.μ.		

Films of the sternal marrow nineteen days from the start of the second course of folic acid (table II) contained some abnormally developing granulocytes and a few megaloblasts. Section of the marrow, however, showed a return to a degree of cellularity only slightly above normal. A third course of folic acid (50 mg.) was now given, in *divided dosage as before*, for eight days.

The red-cell count and Hb level continued to rise slowly, but no further reticulocyte peak developed. Six days from the start of the third course (table II) the sternal marrow showed entirely normal erythropoiesis and granulopoiesis :

Red cells ..	4,200,000 per c.mm.	White cells ..	6000 per c.mm.
Hb	85 % (Haden) (13·26 g.)	Reticulocytes	1·2 %
Colour-index ..	1·01		

Patient's condition was now very good ; *he felt* well, had an excellent appetite, and could walk without dyspnœa. The pigmentation of face and hands persisted, the tongue remained smooth, and repetition of gastroscopy (Mr. Aven Jones) revealed no change in the atrophic mucosa. It is interesting that after the folic-acid therapy he evinced a liking for fresh green vegetables for the first time.

Maintenance therapy with folic acid 20 mg. orally, twice weekly, was now instituted.

Latest blood-count, 3 months *from start of therapy* :

Red cells ..	5,000,000 per c.mm.	White cells ..	6000 per c.mm.
Hb	94 % (Haden) (14·6 g.)	Reticulocytes	1·4 %
Colour-index ..	*0·94*		

DISCUSSION

The characteristic structure of the megaloblastic bone-marrow is familiar, *particularly in pernicious* anæmia, and several descriptions have been given of the reversion to normoblastic *erythropoiesis under the* influence of the liver principle (Davidson et al. 194 Scott 1939, Wilson 1942). Interpretation of *the prese* of megaloblasts as an abnormal series never *found* in the absence of deficiency of the hæmopoietic principle has been emphasised (Israëls 1939, Jones 1943). Many observers have suggested that abnormal changes in the granulocytic series are equally as characteristic of deficiency of the hæmopoietic principle as is the coexistent megaloblastic proliferation.

La Cour (1944) considers *that abnormal* mitoses in red-cell and granulocytic series are responsible for the *formation of megaloblasts and abnormal* granulocytes in the marrow of pernicious anæmia, and that the two series show well-marked *differences in the* amounts and distribution of nucleic acids. In the marrow of pernicious anæmia and in other conditions, such as tropical sprue and macrocytic megaloblastic anæmia of pregnancy, cells with deeply basophilic cytoplasm become more numerous. These cells are hæmocytoblasts (stem cells for granulocytes and red cells), early members of the normal red-cell series, and early megaloblasts. Cytochemical tests with ribonuclease suggest that the basophilia of these cells is due to the presence of considerable amounts of ribonucleic acid (White 1946). Response of the megaloblastic marrow to hæmopoietic principle leads to rapid reversion to the normal type of maturation, with disappearance of megaloblasts and abnormal granulocytes and reduction of the hæmocytoblasts and basophilic early cell types to within normal limits.

These changes are typically seen in pernicious anæmia treated with highly purified preparations of the liver principle. Megaloblasts rapidly disappear from the marrow, mitoses are numerous in the early stages of the response, and at the time of the reticulocyte *peak* the marrow shows intense normoblastic erythropoiesis and orderly maturation of granulocytes.

The response of the megaloblastic marrow to succes folic-acid therapy appears to differ in no way from t characteristic response to purified liver principle. Report by Spies (1946a) and by Kaufmann and Schwager (1946 indicate that the essential change in *the* marrow unde therapy is a rapid reversion from megaloblastic t normoblastic erythropoiesis, with *a reticulocyte respons* and return of the red cells and leucocytes in the peri pheral blood towards normal *levels*. In the *present* cas of advanced pernicious anæmia the marrow showed complete return *to normoblastic* erythropoiesis, wit total absence of megaloblasts and abnormal granulocytes in a *sternal-marrow specimen* taken nine days afte the start of folic-acid therapy. Before treatment th predominantly *megaloblastic* erythropoiesis and accum lation of hæmocytoblasts were very striking. H metabolism also became more normal, as shown by th fall in urinary urobilin and ultimately in the reduce serum-bilirubin level.

The diagnosis of pernicious anæmia was substantiated by the changes in peripheral blood and bone-marrow, the histamine-fast achlorhydria, and atrophic gastritis.

The question arises whether the two transfusions could have provoked the hæmopoietic response. They were given twenty-four and forty-eight hours after the start of folic-acid therapy, when the patient's general condition was still precarious; it was evident that their immediate effect was good, and the cardiac failure did not increase. The well-marked reticulocyte response—3·4% initially, 27·6% at the peak—began on the fourth day of therapy, with the peak on the sixth day. It appears very unlikely that the transfusions could have been responsible so rapidly. Spies (1946a) observed incipient reticulocyte response 4–7 days after the start of therapy in five cases of pernicious anæmia, with peaks at 7–10 days, and the results in the present case strongly suggest that the folic acid was responsible. It is also unlikely that a natural remission coincided with administration of folic acid, because before the start of therapy the red-cell count and the amount of Hb actually decreased, and reticulocyte levels were low. The lack of response to liver therapy some time before folic-acid therapy was very probably due to the extract having lost potency, since it was six years old.

The initial dosage of folic acid was sufficient to effect temporarily a complete return to normal erythropoiesis and granulopoiesis in the marrow. The subsequent rise in the red-cell count and the Hb level was considerable, but continued therapy produced a second reticulocyte response, with further improvement in the peripheral blood picture. It should be noted, however, that early megaloblastic changes had reappeared before the second course of folic acid. Similar marrow findings nineteen days after the start of the second course also indicate that megaloblastic erythropoiesis and disordered granulopoiesis rapidly recur in the absence of continued administration of folic acid. These changes can be eliminated completely within a few days by readministration of folic acid, and it is evidently necessary to repeat the maintenance dosage at short intervals to sustain normal hæmopoiesis. The maintenance level has not been determined, but in the present case 20 mg. of folic acid twice weekly is to be given a trial. Further clinical trials are to be made with other cases to determine the optimal dosage.

Repeated small doses were manifestly sufficient to secure a gradual return to a normal blood picture in the present case. Davidson and Girdwood (1946) have advocated a single large initial dosage, followed by similar weekly or fortnightly maintenance doses, in pernicious anæmia.

Further knowledge is required of the possible function of folic acid as an enzyme or coenzyme before it will be possible to assess its significance in reversing megaloblastic erythropoiesis and its rôle in the normal maturation of red cells.

The position of folic acid in preventing subacute combined degeneration has not been determined yet. Signs of neurological involvement were absent at all times in the present case.

SUMMARY

The response of an advanced case of pernicious anæmia to folic acid given by mouth is described.

Therapy led to a return to normal hæmopoiesis, as shown by the changes in sternal marrow and peripheral blood.

Repeated doses of folic acid were necessary to maintain normal hæmopoiesis.

Our thanks are due to Prof. J. McMichael and Prof. J. H. Dible for their interest and assistance in this study; Dr. T. F. Macrae, who kindly made available supplies of synthetic folic acid donated by Messrs. Lederle; and numerous colleagues in the British Postgraduate Medical School for their coöperation and assistance. The photomicrographs were made by Mr. V. Willmott.

Continued at foot of next column

Continued from previous column

REFERENCES

Angier, R. B., et al. (1946) *Science*, 103, 667.
Berry, L. J., Spies, T. D. (1946) *Blood*, 1, 271.
Castle, W. B., Townsend, W. C., Heath, C. W. (1930) *Amer. J. med. Sci.* 180, 305.
Darby, W. J., Jones, E. (1945) *Proc. Soc. exp. Biol., N.Y.* 60, 259.
— — Johnson, H. C. (1946) *J. Amer. med. Ass.* 130, 780.
Davidson, L. S. P., Davis, L. J., Innes, J. (1942) *Quart. J. Med.* 11, 19.
— Girdwood, R. H. (1946) *Lancet*, Sept. 14, p. 373.
Day, P. L., Langston, W. C., Shukers, C. F. (1935) *J. Nutrit.* 9, 637.
— et al. (1945) *J. biol. Chem.* 157, 423.
Israëls, M. C. G. (1939) *J. Path. Bact.* 49, 231.
Jacobson, B. M., SubbaRow, Y. (1937) *J. clin. Invest.* 16, 573.
Jones, O. P. (1943) *Arch. Path.* 35, 752.
Jones, W. (1920) Nucleic Acids, London, p. 18.
Kaufmann, J., Schwager, P. G. (1946) *Canad. med. Ass. J.* 54, 539.
La Cour, L. F. (1944) *Proc. roy. Soc. Edinb.* 62, 73.
Mitchell, H. K., Snell, E. E., Williams, R. J. (1941) *J. Amer. chem. Soc.* 63, 2284.
Pfiffner, J. J., et al. (1943) *Science*, 97, 404.
— — (1945) *Ibid*, 102, 228.
Scott, R. B. (1939) *Quart. J. Med.* 8, 127.
Snell, E. E., Mitchell, H. K. (1941) *Proc. nat. Acad. Sci., Wash.* 27, 1.
— Peterson, W. H. (1940) *J. Bact.* 39, 273.
Spies, T. D. (1946a) *J. Amer. med. Ass.* 130, 474.
— (1946b) *Lancet*, i, 225.
— Frommeyer, W. B., Vilter, C. F., English, A. (1946) *Blood*, 1, 185.
Stokes, J. L. (1944) *J. Bact.* 48, 201.
Stokstad, E. L. R. (1941) *J. biol. Chem.* 139, 475.
SubbaRow, Y., et al. (1945) *Science*, 102, 227.
White, J. C. (1946) in the press.
— Baker, J. R., Griffin, J. G. (1946) *J. Path. Bact.* 58, 155.
Wills, L. (1931) *Brit. med. J.* i, 1059.
— (1945) *Biochem. J.* 39, xxxii.
— Evans, B. D. F. (1938) *Lancet*, ii, 416.
Wilson, T. E. (1942) *Med. J. Aust.* i, 513.

EXAMINATION OF HOME-CONTACTS OF TUBERCULOUS PERSONS

W. POINTON DICK
M.R.C.S.
PHYSICIAN I/C MASS RADIOGRAPHY UNIT, AND LATELY ASSISTANT TUBERCULOSIS OFFICER FOR MIDDLESEX

BRIAN C. THOMPSON
M.A., M.D. Camb.
TUBERCULOSIS OFFICER, OTAGO HOSPITAL BOARD, N. ZEALAND; LATELY TUBERCULOSIS OFFICER FOR MIDDLESEX

THE examination of home-contacts of tuberculous persons is one of the most important parts of the preventive work of chest clinics. It enables incipient disease to be checked and brings to light sources of infection that may be present in the home. Such examinations could well be undertaken by a mass radiography unit, and it is hoped to deal with this possibility in a further communication.

Thompson (1944) described a suggested programme for the routine examination of home-contacts and presented statistics for the years 1942–43. It is now possible to analyse the results of a close follow-up of all available home-contacts seen at the Ealing Chest Clinic during the years 1942–45. During this time 3168 persons (2025 adults and 1143 children) were examined, and 186 persons (111 adults and 75 children) were found to have significant lesions. An average of 2·5 contacts were seen for every index-case. The age-distribution of examinees and cases is shown in table I.

It will be noted that the greatest number of examinees per year of age falls into the 0–4 age-group, and that there is a steady diminution in the numbers examined as the older age-groups are approached; and that the highest percentage of cases of tuberculosis was found in the age-groups 0–4 and 15–24. These are dealt with in more detail below.

Contacts of non-pulmonary tuberculosis in whom no significant abnormality could be detected on first examination were not recalled for a further interview, the object of the investigation being essentially to find the source case. On the other hand, contacts of cases of pulmonary tuberculosis were seen at three-monthly intervals: the children for a tuberculin test and clinical examination to be followed by radiography if the skin test were positive; the adults for radiography and a clinical examination. Some persons, having attended for their first and possibly a subsequent examination, did not report again and were lost sight of. Occasionally one of these recalcitrant contacts was referred to the clinic by his doctor or a hospital and was found to have developed a significant lesion since his last attendance. In table II those persons found to have pulmonary tuberculosis are grouped according to the time of diagnosis of their disease. As would be expected, the greatest number of cases was found at first examination.

TABLE I—AGE-DISTRIBUTION

Age-group (yrs.)	0–4	5–14	15–24	25–34	35–44	45–54	55 +
Total examined	405*	738	559	450	430	356	230
No. with significant lesions	34 (8·4%)	41 (5·5%)	57 (10%)	24 (5·3%)	18 (4·2%)	6 (1·7%)	6 (2·6%)

* 255 (63%) of this group gave a positive tuberculin reaction.

An analysis of the 34 cases in the age-group 0–4 (table I) shows that with one exception they were all in contact with a sputum-positive case. Of the 34 patients 5 died (2% of the positive reactors), and all 5 had been living in infectious households. Of these children 3 were less than a year old, 1 was aged 14 months, and 1 was aged 3 years. They all died within eight weeks of diagnosis, except 1 child who died after fifteen weeks.

The great importance of examining all available contacts in the age-group 15–24 is emphasised by the fact that 1 out of every 10 persons examined in this group had a significant lesion. This is about twice the proportion found in the age-groups 25–34 and 35–44, and over four times as high as in persons aged 45 or more.

The cases of pulmonary tuberculosis among adults have been subdivided in table III according to the stage of their disease.

> The diagnostic standards of the National Tuberculosis Association of America (1940) were used, minimal lesions being defined as being without demonstrable excavation and confined to a small part of one or both lungs, the total extent of the lesions, regardless of distribution, not to exceed the equivalent volume of lung tissue which lies above the second chondrosternal junction and the spine of the fourth, or body of the fifth, thoracic vertebra on one side.

TABLE II—TIME OF DIAGNOSIS

Group	No. examined	No. with significant lesions			
		At 1st exam.	At subsequent exam.	Referred by doctor	Total
Adults ..	2025	77 (3·8%)	17	17	111 (5·5%)
Children	1143	58 (5·1%)	17	..	75 (6·6%)
Total..	3168	135 (4·3%)	34	17	186 (5·9%)

It was found that, whereas three-quarters of the cases discovered on first examination and four-fifths as the result of routine re-examination had minimal lesions, among those persons who had defaulted and were subsequently referred to the clinic the proportion of minimal lesions fell to a half. It does not follow that the defaulters fared worse than the other two groups, for there may well have been a high proportion of minimal lesions among the defaulters who did not return to the clinic.

The disposal of the 111 adults with tuberculous lesions is shown in table IV. There is a steep rise in the percentage of cases requiring treatment among those who did not remain under observation. It is also highly significant that among contacts the percentage of cases of previously undiagnosed tuberculosis requiring treatment is five times that found among the general population by mass radiography.

The Medical Research Council (1942), discuss contact examination, recommends that young adu (aged 15–30) should be radiographed at three-mont intervals and continue to be kept under observation *at least two years after contact is broken*; and that re-examination of contacts over thirty years of age m be dispensed with, if necessary through pressure of wo as being less likely to be productive of cases. The findi at the Ealing Clinic support this view. Of the 17 perso found at routine re-examination to have significa lesions only 2 were over thirty years of age. When is realised that about 60% of the adult contacts we in this older age-group, it will be seen that a very conside able saving in work could have been effected by omitti to re-examine those over thirty years of age, and th during the four years under review only 2 cases wou have been missed.

All children with significant disease were in contact wi a positive index-case, except 1 in whom contact had bee broken for thirteen months. All adults were in conta except 5 cases discovered at first or subsequent exam nation in which contact had been broken for from four t fifteen months; 5 cases discovered at first examinatio in which the index-case was negative; and 10 case discovered on reference by doctor in which contact ha been broken for fifteen months in 2 cases and for from thre to five years in 8 cases. These last patients havin previously defaulted, it was impossible to decide the exac time at which their disease had first appeared.

TABLE III—STAGE OF DISEASE IN 111 ADULTS

Stage of disease	At 1st examination	At subsequent examination	Referred by doctor
Minimal	59 (77%)	14 (82%)	8 (47%
Moderately advanced	15	3	7
Far advanced ..	3	0	2
Total	77	17	17

COMMENTS

Ideally all contacts of all cases of tuberculosis should b examined at least once. All contacts of sputum-positiv cases should be examined at three-monthly interval while contact continues and for two years after contac is broken. As a practical programme, when pressure o work is a limiting factor, all contacts should be see once, but the routine re-examination of those over thirt years of age can be omitted. Two age-groups, 0–4 an 15–24 years, require special mention as producing th highest proportion of cases. In the age-group 0–4 years 2% of those presenting a positive tuberculin reactio developed fatal tuberculosis, and all but one of those wh died were under eighteen months old. It was felt tha the only factor which could influence this result was th immediate breaking of contact with infection, and that *if the child* survived the first three months after becomin tuberculin-positive, the results were uniformly good.

TABLE IV—DISPOSAL OF 111 ADULTS

Group	At 1st exam.	At subsequent exam.	Referred by doctor	Total
Observation	45 (2·2%)	8	3	56 (2·8%)
Treatment	32 (1·6%)*	9	14	55 (2·7%)
% requiring treatment	42%	53%	82%	50%

* cf. 0·3% found by mass radiography (Dick 1945). Figures in parentheses are percentages of 2025 examinees.

The examination of all available persons in the age-group 15–24 years is of first importance in any programme of contact examination. In this group 1 in every 10 persons had a significant lesion. A constant factor in all groups was a history of present or recent contact with a positive index-case.

REFERENCES

Dick, W. Pointon (1945) *Brit. med. J.* ii, 568.
Medical Research Council (1942) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 246.
National Tuberculosis Association of America (1940) Diagnostic Standards.
Thompson, B. C. (1944) *Publ. Hlth, Lond.* 57, 111.

HYPERTENSION AND CALCIUM INTAKE

C. M. KESSON
M.D. Glasg.
CAPTAIN R.A.M.C.

A. McCUTCHEON
F.I.M.L.T.

From the Department of Materia Medica and Therapeutics, University of Glasgow, and the University Medical Clinic, Stobhill Hospital, Glasgow

THE statement has been made that a high-calcium diet is an important factor in the production of hypertension in subjects over middle age.[1] During an investigation of the ætiology and treatment of senile osteoporosis we have made observations which throw some light on the relationship between the intake of lime and hypertension.

Low Calcium Intake.—In all, 80 patients over the age of forty years were examined. Of these, 32 gave definite radiographic evidence of osteoporosis in at least three regions of the body. All were in the wards of a municipal hospital, and there is no doubt that they had been for years consuming diets with a calcium content of less than 0·5 g. a day, the amount usually accepted as the minimal intake. The percentage utilisation of lime varies considerably from subject to subject, but it seems reasonable to assume that the amount of calcium retained was not so high in the osteoporotic patients as in the others. Since all the patients came from the same social stratum, one would expect that hypertension and arteriosclerosis would be rather less prevalent in the osteoporotic group, if the retention of calcium is an important ætiological factor in hypertension.

The average blood-pressure in the osteoporotic group was 164/96, and in the other 167/96 mm. Hg. The relationship of arteriosclerosis and calcification to osteoporosis was as follows:

Arteriosclerosis found on clinical examination		*No. of patients without osteoporosis*		*No. of patients with osteoporosis*
Nil	..	13 (27%)	..	8 (25%)
Slight	..	15 (31%)	..	12 (37%)
Pronounced	..	20 (42%)	..	12 (38%)

Calcification of arteries on radiological examination		*No. of patients without osteoporosis*		*No. of patients with osteoporosis*
Nil	..	23 (48%)	..	11 (34%)
Slight	..	7 (15%)	..	12 (38%)
Pronounced	..	18 (37%)	..	9 (28%)

These results clearly indicate that there was no special association between osteoporosis and hypertension, physical phenomena of arteriosclerosis, or calcification of the vessels as demonstrated by radiography. In several patients with osteoporosis it was possible to demonstrate calcification of arm and leg vessels though the bones showed well-marked rarefaction.

High Calcium Intake.—In the course of the investigation it was found necessary to supplement the ordinary hospital diet of 19 patients with calcium salts (gluconate or phosphocarbonate) so that each patient was taking not less than 1·6 g. of calcium a day. This was maintained for periods ranging from six to fifteen months. In 9 patients the retention of calcium was determined for two weeks at the start of the investigation, and it was found that the average amount retained was 1·051 g. a day (limits 0·556 and 1·358 g.). In 2 of these patients a repeat estimation was made, in one case fourteen weeks later and in the other case eighteen weeks later. In both instances the retention of calcium still remained high (670 and 1306 mg. a day), as in the first month of the high-calcium diet. It therefore appears that throughout the investigation large amounts of calcium were retained. If a high retention of lime is an important ætiological factor in the production of hypertension, one might have expected to find some sign of hypertension in these patients. In no instance, however, was there any significant change in the systolic or diastolic pressures. In only 1 patient was there any radiological evidence of increased deposition of calcium. In this patient, a woman aged 66 years, the slight increase in the vascular shadow was not more than might be expected in a subject of that age irrespective of diet.

CONCLUSION

These findings provide no evidence that a high retention of lime prolonged over many months has any effect on the development of hypertension or on the calcification of the vessel walls.

We wish to thank Prof. Noah Morris for his interest and help, and Dr. S. Briggs, medical superintendent of Stobhill Hospital, for permission to conduct the investigation.

---

[1] Harris, I. Studies in Hypertony, Bristol, 1946.

Medical Societies

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

AT a meeting of the society in Liverpool on Oct. 4, Dr. **BRYAN WILLIAMS**, speaking on

Factors Causing Difficult Labour in Multigravidæ

said that his observations were based on women who had had at least eight normal deliveries previously; a low forceps delivery, an unaccountable stillbirth, antepartum hæmorrhage, or any other complication not directly associated with the actual birth of the child was not included as an abnormality.

In 23 cases satisfying these criteria, difficulty with subsequent labour was usually caused by either an unusually large child or some contraction of the pelvis, or both. There was convincing evidence of a tendency for babies to be larger at successive deliveries. Often the pelvis was definitely contracted; this contraction, which was acquired after the birth of the first child or first two children, was probably due to minor osteomalacic changes.

Similar changes have been noted by observers in countries, such as China, where they are very prevalent. Dr. Williams was satisfied that the lack of certain vitamins, and especially vitamin D, in the diet of many in this country causes these bony changes which eventually give rise to dystocia at some future birth.

Avoidance of Catheterisation following Vaginal Plastic Operations

Mr. A. A. **GEMMELL** said that he recommended the instillation of 1 oz. of 0·5% mercurochrome into the bladder directly after operations for prolapse, &c. A group of 63 patients was treated by this method and the results compared with those in 50 patients who had not received this instillation. Catheterisation was necessary in 9·5% of the first group, and 72% of the second. The efficacy of mercurochrome is, he considers, due to the irritant action of the solution.

Erythroblastosis Fœtalis

At a meeting in Sheffield on Nov. 1, Dr. C. C. **BOWLEY** said that erythroblastosis, which occurs only once in more than 300 labours, if untreated carries a mortality-rate of nearly 80%. Of those infants who do recover, 10% may be affected by hepatosplenomegaly or lesions of the central nervous system. Erythroblastosis fœtalis should be anticipated by routine Rh typing of the blood of every pregnant woman; and where the blood is Rh-negative, it should be examined for atypical agglutinins, at the 8th month in primigravidæ and at least once before the 8th month in multigravidæ. A previous transfusion should be considered as having the same effect as a pregnancy, and all emergency transfusions should be carried out with Rh-negative blood. When atypical agglutinins are discovered, their titre should be determined at once, and again each month until delivery; and this routine should be observed, *whether or not atypical agglutinins have been identified*, in all multiparæ with a history of children affected by erythroblastosis fœtalis. Because of the erythroblastotic infant's disposition to hæmorrhage, vitamin K should be given to the Rh-negative mother before delivery; this is effective if given as little as four hours before delivery. If given orally, it should be administered with bile salts, so as to break up the fat vehicle and to obtain maximum absorption; when given to the child, the vitamin should be dissolved in water and administered by intramuscular injection. Dr. Bowley recommended early blood-transfusion, even before the typical blood picture is seen; a Rh-negative red-cell concentrate, he concluded, should always be used, and should be given as fresh as possible.

Reviews of Books

Repertorium Pharmazeutischer Spezialpräparate

Editor: Dr. med. HERBERT LUDWIG, privatdozent an der Universität, Chefarzt am Bürgerspital, Basle; with the help of Prof. Dr. phil. F. L. FURLAN and Dr. med. E. LOELIGER. Basle: Verlagsgesellschaft Beobachter. Pp. 1308.

BEFORE the war, those who needed to find the maker and composition of Continental proprietary drugs relied chiefly on Gehes Codex. The last edition of Gehes to reach this country was published in 1937, and the last supplement in 1939; many new products, and names for them, have appeared since then. This new Swiss work, published in German, is a list of about 10,000 special pharmaceutical preparations including sera and vaccines by over 2000 different manufacturers, mostly Continental but with some British and American preparations. The information on each product, which was obtained from the manufacturer, is given under the headings: manufacturer, composition, indications, form in which issued, and dosage. In addition, pharmacological and clinical data, printed in italics and provided and paid for by the manufacturer, are given for a number of products. German and Austrian proprietaries are included since it is uncertain which of these will reappear and which will prove to have disappeared permanently. There are, besides, a therapeutic index, and a list of manufacturers and the products they issue—a helpful addition to the main text. The work is not likely to prove exceptionally useful to doctors in this country, but will appeal to all who need to know the maker and composition of proprietary drugs, particularly Continental ones.

Studies in Hypertony and the Prevention of Disease

I. HARRIS, M.D., director, Institute for Prevention of Disease, physician, Liverpool Heart Hospital; in coöperation with J. T. IRELAND, B.SC., G. V. JAMES, M.SC., EDWARD CRONIN LOWE, M.B., and C. E. VERNON, M.SC. Bristol: John Wright. Pp. 114. 12*s.* 6*d.*

CONTRIBUTIONS to our knowledge of the life-history of hypertension must be carefully but critically received. This book describes researches carried out by Dr. Harris and his collaborators at Liverpool. It includes chapters on calcium, cholesterol, the influence of fats on protein metabolism, and potassium requirement. Experiments are recorded in which calcium appeared to have raised blood-pressure in rabbits. These animals, however, were given doses which would represent an enormous amount for the human subject. Before a high-calcium diet is invoked as an important factor in the production of hypertension it seems reasonable to ask for some evidence that it raises the blood-pressure in man. None is given: instead we are treated to an outburst against the Ministry of Food, the Medical Research Council, and some scientific workers. Those who have worked in poor-law institutions will be aware that advanced arteriosclerosis can sometimes be demonstrated in patients whose intake of calcium has been very low and who show signs of calcium impoverishment. It is fairly clear that the deposition of lime in arteriosclerotic patches is a process quite different from ossification, and it will require much more evidence than Dr. Harris has so far adduced to convince us that fortification of bread with calcium is likely to lead to arteriosclerosis and hypertension.

Annual Review of Physiology

(Vol. VIII.) Editor: JAMES MURRAY LUCK, Stanford University, California. London: H. K. Lewis. Pp. 658. 30*s.*

THE editors and authors of this year's volume are to be congratulated on one of the best productions of the series. Their aim is to provide reviews of the important contributions of the preceding year or biennium, "appraise them critically, and evaluate with discrimination the present status of the subject." Many subjects of clinical interest are covered, including resistance to heat stress and cold stress, the therapeutic use of heat and cold, and the mechanism of temperature regulation; energy metabolism in relation to nutrition; physiology of the skin in relation to sweating and vascular reactions; peptic ulcer; blood-coagulation; thrombosis and hæmorrhagic disorders; clinical hæmatology; blood-groups; visceral functions of the nervous system; aviation physiology; physiological psychology; applied physiology; and sulphonamides and penicillin. Though many researches made during the war are still unpublished, some are beginning to emerge: thus, aspects of resistance to high temperature and dehydration are treated in a number of reviews, and some misconceptions and traditions relating to shock are corrected in Gregersen's article.

The World's Hunger

FRANK A. PEARSON; FLOYD A. HARPER. London: Oxford University Press. Pp. 90. 9*s.* 6*d.*

THIS brief book is—and is clearly intended to be—a corrective pill for world planners. The reader, as he takes it, should have its purpose in mind. It may purge him of a few illusions; but let him remember *that there is more, much more, to be said than the* writers admit or have even assimilated into their scientific philosophy. They are two professors of Cornell University, the one of prices and statistics, the other of marketing; and they have concentrated their attention upon consumption levels, production, and the sources of increased production. Three-quarters of the world's population live in Asia and Europe, and it cannot be assumed that the rest of the world can be so developed for food-production as to adjust this inequality. A very large proportion of the earth's surface is only partially cultivable, and only 4·3% is at present under crops—the proportion ranging from 19·9% in Europe to 1·1% in Oceania. Careful examination of soils, rainfall, climate, and so forth, leads the writers to conclude that the cultivable area cannot be very far extended—perhaps to no more than 7% of the land area of the globe. But there we may pause. The figures appear to be correct, but not enough allowance is made for man's ability to apply new methods and particularly his capacity to make better use of the soil at present under cultivation.

It is useful to be dosed with physic at times, especially since the world's population is not only unevenly distributed but still increasing; but the close of the book *is patently addressed to a transatlantic audience*, and makes one wonder how far the writers came to their conclusions before they studied their brief. Theirs is an almost shameless scientific pessimism:

> "Europe is the danger spot. It is rich in agriculture and other natural resources and has a great industrial plant. It has had a high standard of living, which has been rising. It has the second largest continental population, which has been increasing. For over a century the excess spilled over into North and South America. This honeymoon for Europe is over, however."
>
> "It seems reasonably clear that there are no large areas of new land to be brought into cultivation, that each continent will tend to manufacture an increasing proportion of the products it consumes, that immigration will continue to be restricted, and that there will be insufficient controls to prevent population from expanding."

They may be right; yet surely this is a challenge to man's innate ability to organise and overcome?

'Benadryl'

n anti-allergic and anti-spasmodic agent

Benadryl is a synthetic compound which belongs to a new and distinct pharmacological group having a specific anti-histamine action.

Extensive clinical studies have shown that Benadryl affords relief in a variety of allergic manifestations, including hayfever, urticaria, contact dermatitis and serum reactions. It is also effective in relieving the spasm of smooth muscle, such as may occur in dysmenorrhœa, etc.

Benadryl is administered orally and, in responsive conditions, it exerts a beneficial effect within a few hours. The most striking results reported have been in the control of symptoms associated with hayfever and urticaria.

Benadryl is issued in bottles of 50 capsules each containing 50 mgm., but at present supplies are limited

A booklet describing Benadryl will be sent on request

PARKE, DAVIS & CO., 50 BEAK STREET, LONDON, W.1

Laboratories: Hounslow, Middlesex. *Inc. U.S.A., Liability Ltd.*

EVANS

This proteolysed
liquid liver extract
meets the need of those
who do not tolerate or
respond to liver by injection

HEPATEX
ORAL

for the treatment of
pernicious anaemias, including
refractory anaemia, pernicious
anaemia of pregnancy, sprue
and nutritional anaemias

Issued in bottles of 4 fl oz.

Ample supplies available

Literature gladly sent on receipt of request

Made in England by

Evans Medical Supplies Ltd

Speke
LIVERPOOL 19

Bartholomew Close
LONDON EC1

THE LANCET

LONDON: SATURDAY, NOV. 30, 1946

The Electronic and the Human Brain

ANOTHER war secret now disclosed is an electrical calculating machine which has been built in the United States and has been called an "electronic brain," or more accurately an Electronic Numerical Integrator and Computer—ENIAC. The principles on which this machine is constructed have been described by HARTREE.[1] Calculating machines are not new, and ENIAC does not seem to do anything qualitatively different from what simpler machines have done in the past. The use of electronic valves, howver, has enormously increased its speed and hence ts range of applicability. Built at the Moore school f engineering of the University of Pennsylvania, t operates by the counting of electrical pulses by lectronic counting circuits. If such a machine is o carry out a series of arithmetical operations it is necessary first that the required sequence should be urnished to it in such a form that it can be followed automatically and at a speed comparable with that of the individual operations, and secondly that the machine should be able to record and retain intermediate results of the calculation. Thus it requires equipment for carrying out arithmetical operations, a means of organising their sequence, and a "memory" for the numbers on which the operations are to be performed and for their results. The basic units of ENIAC are "accumulators," whose numerical portion consists of ten decade counters, one for each decimal place, a decade counter consisting of ten double-triode valves in a ring. At any one time only one valve in the ring is in the excited state, and the reception of a single pulse steps the excitation from one valve to the next. Results of the operations are put out in the form of punched cards. ENIAC can perform a multiplication in rather less than 3 milliseconds; so a computation involving altogether 10 million multiplications would take about 8½ hours.

The National Physical Laboratory is now planning a machine called ACE (Automatic Computing Engine), which will work at the speed of ENIAC, or possibly a somewhat higher speed, and will take advantage of new technical developments, permitting both a greater "memory" capacity and a higher degree of complexity in the instructions. It is intended that this machine shall be able to multiply two ten-figure numbers in 0·002 sec., and its speed and range will enable it to solve mathematical problems hitherto almost insoluble with pencil and paper. It will be able to tackle simultaneous equations with fifty or even a hundred unknowns.

ENIAC has been credited with both "memory" and "judgment." If it is to work it must retain the effects of previous excitations in such a way as to influence its response to future stimuli; but this is a property of many material systems, and the mountain might with equal truth be said to remember the glacier which grooved it. Some such electrical change occurring in the brain is doubtless the basis of true memory; but memory involves the presentation of the past to consciousness, and to apply this term to a calculating machine except by analogy is to confuse the material basis of memory with memory itself. So also with judgment. HARTREE[2] explains that in extended calculations it often happens that there are two or perhaps more alternative courses open, and it is necessary to choose between them, the choice depending on the work done up to that stage. "An electronic calculating machine can be designed and set up so that on the occurrence of a situation requiring such a selection of procedure, it first selects the appropriate criterion, if such selection is necessary, then applies it, assesses the result of applying it, and takes the action necessary to initiate the course of procedure thus indicated." This is held to imply the exercise by the machine of "a certain amount of judgment," the limiting factor being the operating instructions supplied to it. But the machine's "choice" is clearly automatic, and a calculating machine which whimsically began to exercise free will would considerably disturb the mathematicians who received the results of its operations. There is thus no basis for alarmist visions of intelligent robots making slaves of humanity. Machines, however complex, are no more than tools; and tools, as SAMUEL BUTLER pointed out, are only detachable extensions of the human body. No machine can carry out processes which have not been fathered by the human mind, though the machine's speed and efficiency may raise man's intentions to the *n*th power of beneficence or devastation.

But to compare ENIAC with the human brain is to see at once how limited, and indeed amateurish, an apparatus it is. ENIAC with its 18,000 valves consists of 40 panels 8 feet high and 2 feet wide—a total surface area of 640 square feet: the human head contains 10,000 million electrical units in the cerebral cortex alone. To apply the term brain to ENIAC is to adopt, implicitly, a conception of the working of the brain which, as Dr. F. M. R. WALSHE, F.R.S., showed in his Victor Horsley lecture delivered this week,[3] is now outmoded. Many years' study of the electrical excitation of the cerebral cortex established what may be called the popular physiological view "that the motor cortex is a close-set mosaic of points, in each of which is represented or localised a physiological unit of movement"; that is to say, the correlation between excitable cortical spot and corresponding movement is one to one, and this connection is permanent. The nervous system on this hypothesis is an immensely complicated but equally rigid ENIAC. WALSHE shows that alongside this "Newtonian" conception neurology, especially English neurology, has maintained an alternative theory, originated by HUGHLINGS JACKSON, which the most recent experimental work shows to be correct. Both discharging lesions, such as the Jacksonian fit, and destroying lesions causing hemiplegia demonstrate the existence of "leading parts" in the motor cortex, the areas for the hand, face, and foot, which are the foci of convulsions and whose movements suffer most in hemiplegia. Clinical observation also shows that it is movements and not structures which are represented in the cortex, and that the representation of movements is multiple in the sense that a given cortical focus must contain the anatomical and physiological substrata of more than a single movement. Conversely, a single movement must be represented in varying degrees of subordination throughout the motor cortex. "The 'hand area,' in brief, is merely, as it were, the macula of the field of hand movement representations." This view clearly involves a profound change in the popular idea of cortical localisation. What is localised is not a part of the body but a performance, and performances are represented not in discrete areas but in mutually overlapping fields, within each of which one locus influences another and the threshold of excitation may shift from place to place.

---

[1] Hartree, D. R. *Nature, Lond.* 1946, 157, 527; 1946, 158, 500.

[2] Hartree, D. R. *Times*, Nov. 22, p. 5.

[3] Walshe, F. M. R. On the Contribution of Clinical Study to the Physiology of the Cerebral Motor Cortex. Edinburgh: E. & S. Livingstone. 1946.

As **WALSHE** points out, our present knowledge of cortical function is the product of the Jacksonian method—the application of conceptual thinking to the facts of observation—of which **WALSHE**'s lecture is itself a notable example. His stress on this is timely. **JOHN HUNTER**'s words to **JENNER**: "Why think? Why not try the experiment?" are often misapplied at present. None knew better than **HUNTER** that observation, though it comes first, is incomplete until it has been thought about. Today we have in medicine, if not too many observers, certainly too few thinkers. **WALSHE**'s plea for conceptual thinking is apposite also in another sense. In the world of thought outside medicine the barriers between science and philosophy are being broken down. Scientists, like **EDDINGTON**, have become philosophers because their observations compelled conceptual thinking. From the opposite direction **BERTRAND RUSSELL**[4] can say that the philosophical school of "modern analytical empiricism . . . by its incorporation of mathematics and its development of a powerful logical technique, is able, in regard to certain problems, to achieve definite answers, which have the quality of science rather than of philosophy." Science is thus becoming, once more, natural philosophy, and medicine cannot escape the challenge to thought.

Penicillin by Mouth for Gonorrhœa

THE potential importance of the oral route in penicillin therapy has been obscured by the rapidity and comparative certainty of the results with parenteral administration. When the drug is taken by mouth the proportion which can be recovered from the urine is relatively small, and it has been assumed that much of the penicillin is destroyed or inactivated by the acid of the gastric secretion. Attempts to counter this effect by applying enteric coatings to the penicillin, or by the simultaneous administration of buffer substances, have given variable results, but it has been established that the use of neutralising agents does increase the proportion of penicillin absorbed. Thus **SEAGER**[1] found that when he gave penicillin by mouth with aluminium hydroxide, magnesium trisilicate, magnesium hydroxide, trisodium citrate, or aluminium dihydroxyamino-acetate the blood-levels were considerably higher than when an equivalent dose was given in tap water. Yet these levels were still far below those attained by parente administration. As **CUTTING** and others[2] ha suggested, it seems that the gastric acid is not t only factor restricting the absorption of penicill from the gut. This has been confirmed by **McDERMO** and colleagues,[3] who estimated the urinary excreti of penicillin in six patients with complete achlorhyd when identical doses of the drug in watery soluti were given by the mouth and intramuscularly alternate days. After intramuscular injection t amount recovered from the urine varied from 36% 100% of the total dose and was in most cases mo than 60%. After oral administration the amount w only 8–32%, and thus was much the same proporti as in normal controls. In some of the patients w had received penicillin by mouth a small amount antibacterial substance, presumed to be penicilli was recovered from the stools, but this represente only a small fraction of the amount taken. It seeme probable that the remainder was destroyed by pen cillinase produced by bacteria in the intestinal trac The conclusion reached was that when penicillin given by mouth to adults, even with an effectiv antacid, the maximum amount likely to be absorbe is a third of the dose taken; and, since maximu absorption is the exception rather than the rule, a effective oral dose should be about five times as large the normally effective intramuscular dose.

This view was not supported by the findings **LITTLE** and **LUMB**,[4] who gave penicillin "stabilised with egg-white and preceded by sodium bicarbonat and found that oral administration then gave blood levels which were as high as those obtained by th parenteral route. Similarly, **BUSHBY** and **HARKNES** describe in this issue their results in the treatment o gonorrhœa with penicillin by mouth which are no inferior to the general experience with intramuscula injections. The dosage which they used in mos cases—240,000 units—is not much more than tha successfully used by **LLOYD JONES** and colleagues[5] fo intramuscular injection—namely, 150,000 units. Th latter found that the blood-level of penicillin must b maintained at 0·08 unit per ml. for nine and a hal hours to produce a high proportion of cures. **BUSHB** and **HARKNESS** obtained their best results by prolonging the dosage period to fifteen hours; but th blood-levels of penicillin in their patients were no consistently above 0·02 unit per ml., a fact whic supports their view that lower levels than thos usually thought to be essential may be effective i maintained for a longer time. They gave individua doses of 40,000 units, plus 1 g. of sodium citrate every three hours. **BOHLS** and colleagues[6] hav combined penicillin with aluminium potassium sulphate and sodium benzoate in tablets for ora medication, retarding excretion from the kidney b means of the benzoate and thus maintaining a therapeutically effective concentration of penicillin in the blood-stream for twenty-four hours. Of 36 female patients given 400,000 units of penicillin in this way, only 1 failed to respond to the treatment.

---

[4] Russell, B. History of Western Philosophy, London, 1946.

[1] Seager, L. D. *Science*, 1946, *103*, 353.

[2] Cutting, W. C., Halpern, R. M., Sultan, E. H., Armstrong, C. D., Collins, C. L. *J. Amer. med. Ass.* 1945, *129*, 426.

[3] McDermott, W., Bunn, P. A., Benoit, M., DuBois, R., Reynolds, M. E. *Science*, 1946, *103*, 350.

[4] Little, C. J. H., Lumb G. *Lancet*, 1945, i, 203.

[5] Jones, T. R. L., Maitland, F. G., Allen, S. J. *Ibid*, p. 368.

[6] Bohls, S. W., Cook, E. B. M., Potter, R. T. *J. ven. Dis Inform.* 1946, *27*, 60.

There will certainly be further developments along these lines in the treatment of gonorrhœa, for the advantages of oral medication to the patient are clear enough, and considerations of economy are fast becoming obsolete. There will be special scope for this method in the treatment of children, and HENDERSON and MCADAM[7] have shown that in infants, who have a low gastric acidity and probably a relatively sterile jejunum, penicillin is little destroyed in the gut; moreover, the inefficiency of their kidney function delays excretion.[8] The oral route will also be useful in nervous patients, and in seamen and others who have only occasional access to medical supervision. But there are dangers which these developments may render more acute, the chief being over-confidence on the part of patient and doctor. That of the patient is already manifest in the increasing proportion of those who, attending the public clinics for the treatment of gonorrhœa, cease to attend when penicillin treatment is finished. That of the doctor is shown in increasing disregard of those standards of observation and tests which should establish cure BUSHBY and HARKNESS set fairly exacting standards in their present series, but such care in assessment is by no means universal. The achievements of this " wonder drug " may obscure the incontrovertible truth that gonorrhœa remains a disease with a predilection for infectious latency. Unless this is kept in mind mistakes will be made, and mistakes may be disastrous for the individual and the public health.

Experimental Tumorigenesis

IN three lectures lately delivered at the Royal College of Surgeons Prof. ALEXANDER LIPSCHUTZ, of the University of Chile, has reviewed the observations made in his department over many years on the action of steroids in relation to " *tumorigenesis*." These observations have mostly sprung from the discovery that œstrogens injected into guineapigs cause nodules of fibrous tissue to appear in many parts of the abdomen. LIPSCHUTZ and his associates[1] have studied in detail the endocrine environment which favours or prevents the appearance of these nodules, and from data thus obtained he has elaborated hypotheses about the natural " antitumoral " defences of the body, which he believes may throw light on the problem of neoplastic growth in general, including cancer. The fibrous proliferations do not arise when œstrogens are given discontinuously—a fact which leads him to speculate on the advantages of cyclical secretion of œstrogens in the female—and they regress when the stimulus is removed. He conceives of two phases in the production of neoplastic growth: in the first, as seen in his guineapigs, there is proliferation of cells which are physiologically normal, while in the second (which may or may not follow) these cells assume the habit of autonomous, continuous, and irreversible growth. With œstrogens, he admits, the succession of these two phases is rare; " it is probable that the second phase is established by œstrogens only under certain quantitative and timing conditions," and he suggests long and continuous stimulation by very small quantities as the circumstance most likely to turn the phase of proliferation into the phase of neoplastic growth. The critical change might, he thinks, be attributed to a cellular mutation induced by continuous œstrogenic stimulation, or to a virus coming into action under the abnormal conditions such stimulation has produced.

Any close consideration of the views Professor LIPSCHUTZ has thus put before us reveals at once an important difference between his terminology and that now current here. It is clear that, though he speaks of experimental tumorigenesis and antitumoral defence, the guineapig nodules which serve him as test object are not tumours in the sense in which that word has been used of late years by British pathologists.[2] In this country the term tumour has come to be applied only to progressive new formations or neoplasms (benign or malignant) with a capacity for autonomous growth—i e., in the second of LIPSCHUTZ's two phases mentioned above. The nature of the stimulus responsible for this particular kind of cell multiplication is known only in the case of a few neoplasms in which a virus has been demonstrated—chicken tumours, Shope fibromas, Shope papillomas, kidney adenomas of frogs, and the mammary tumours of inbred strains of mice—but it is generally supposed that, whatever the causative stimulus may be, it is situated within the tumour cell. When the stimulus is not peculiar to the tumour and does not lie within the tumour cell, and when the result of withholding it is regression of the former increase in size, then the swelling is not a tumour but a simple hyperplasia. The only exception to this rule appears to be the tar wart of rabbits, which, though a true benign neoplasm, can regress and become latent. That it does not revert to its former state but merely goes into a latent state has been amply proved.[3]

Most of this orthodox pathology was recognised by LIPSCHUTZ and VARGAS[4] in their original papers describing how they produced local proliferations of fibrous-tissue cells, how they made them disappear by withholding the stimulus, and how by the combined applications of antagonistic sex hormones (alternately applied) they prevented the swellings from appearing. Though their description of these two processes as tumorigenesis and antitumorigenesis did not accord with English usage, there was reason for latitude in choice of terms, because these local hyperplasias were thought to be composed of muscle and fibrous tissue and it seemed probable that human fibromyomas would turn out to have the same origin. Human fibromyomas had been (and still are) classed as benign autonomous new growths, no extrinsic cause for them having been ascertained; and it was an advantage to place the spontaneous and experimental conditions in juxtaposition, even at the expense of exact taxonomy, until such time as both could be properly reclassified It appears now, however, that the localised fibrous hyperplasias of guineapigs do not contain any plain muscle-fibres; they are composed of fibroblasts and collagen; it has been impossible to produce them in any other species; and they are not encapsuled—the cells infiltrating slightly at the sites from which they arise. They are therefore not true neoplasms, and not analogous to uterine fibromyomas; and it seems questionable, at least, whether they have any right to retain their provisional title of tumours, even if that title is ascribed to them only by implication. This does not of course exclude the possibility that human fibromyomas may yet be found to be due to a hormonal derangement; but in that case the uterine fibroids would also lose their status in pathology as tumours and would become hormone-conditioned hyperplasias like the experimental hyperplasias of the pituitary which were once thought to be adenomas.

---

[7] Henderson, J. L., McAdam, I. W. J *Lancet*, 1946 i, 922.
[8] Buchanan, J. L. *Ibid*, Oct. 19, p. 560.

[1] His principal collaborators have included Drs Iglesias Vargas Bruzzone, Fuenzalida, and Riesco, and the work has been supported by the Coffin Foundation, the Rockefeller Foundation, the Ella Sachs Plotz Foundation and the National Academy of Sciences of the United States

[2] Kettle, E. H Pathology of Tumours, London, 1925.
[3] Mackenzie, I, Rous, P. *J. exp Med.* 1941, 73, 391.
[4] Lipschutz, A., Vargas, L. *Lancet*, 1939, i, 1313. Lipschutz, A., Murillo, R., Vargas, L *Ibid*, 1939, ii, 420, see also Iglesias, R., Lipschutz, A. *Ibid*, Oct 5, p 488

The discovery of these curious focal fibrous proliferations in guineapigs has been valuable in several ways. It suggested a possible cause of uterine fibroids that had not been thought of; it can be used in demonstrating what is and what is not a true tumour; and it provides in the guineapig a kind of indicator of hormone action and antagonisms. As regards these various uses, it must be admitted that we do not yet know what is the cause of uterine fibroids; and, while it is known that hyperplasias may become converted into true neoplastic tissue, there is no evidence of this happening in the guineapig lesion. As an indicator of action and reaction of the sex hormones of the guineapig these fibrous proliferations enable ingenious experiments to be done, and Professor LIPSCHUTZ in his lectures related a remarkable series. It is of course too early to predict what further knowledge this technique may reveal.

Annotations

A MORAL PROBLEM

NUREMBERG is to be followed by further trials, and among the first to answer charges of atrocious conduct will be some doctors who are said to have misused human beings in scientific experiments. The sort of crimes of which they are accused are described in a collection of narratives by medical survivors from internment camps in Czechoslovakia[1]; and the stories there told suggest a degree of degeneration which few would have thought possible in Europe. Having accepted the Nazi view that extermination of Jews and other enemies was necessary and legitimate, a number of doctors in concentration camps assisted in destroying these lives. From this it was but a step to persuade themselves that the men and women doomed to death should previously be employed as experimental material: if they were killed under controlled conditions—for example, by measured exposure to cold—data could be obtained which might later save the life of a good German soldier. Why should not science, and German arms, make use of this unusual opportunity?

From time to time during the past year or two we have been invited to publish or summarise, for the use of investigators, detailed reports of lethal experiments performed by Germans. None of these has seemed to us, on its merits, worth publicity; for the tests were generally ill conceived and ill conducted and the results no more informative than those already secured by other means. But supposing facts of real value to medicine were still to emerge from the records of the experiments—should they be published or not?

Opinion on this difficult ethical question is divided. Those who favour publication say that the crime has been committed, and that our duty both to the victims and to their surviving friends is to see that all possible advantage is gained from their sufferings, so that they shall not have suffered wholly in vain. If some good can come out of this horror, let it come. Those who would refuse publication argue, on the other hand, that the crime has been committed and that we should make ourselves accessories if we were to profit by it in any way. To do so, they believe, would make it slightly easier for someone in the future to justify another crime of the same kind; and the value of medical progress is as nothing weighed against the harm done to human values by promoting tolerance to systematic murder.

The problem was presented in simple form by a member of our profession in a novel published before the war.[2] Here a hospital doctor kills a patient so as to get information required in his researches—information which proves in fact to be of no small interest and value. After his suicide the hospital's medical committee *faces the question whether this information is to be used.* "May I remind you," says the chairman, "that our duty to our neighbour, our fellow man, comes before even our interest in science?"; and the papers are solemnly burnt. Now that the same problem may arise in real life, ought we to burn the papers? Or is this a case in which we should take the moral risk eternally involved in trying to extract good from evil?

POTASSIUM AND PARALYSIS

THE association of low serum-potassium with attacks of familial periodic paralysis has been recognised for some years, but there has been a conspicuous absence of authentic reports of paralysis associated with low serum-potassium in other conditions. An example has now been reported by Holler[1] in a diabetic girl of 18 years, admitted to hospital in coma. After the administration of 800 units of insulin in twenty-one hours ketosis was overcome, but respiratory paralysis supervened, so severe that the patient had to be put into a Drinker apparatus. Blood for serum-potassium was taken, but without waiting for the result 1·5 g. of potassium chloride was given intravenously, with great clinical improvement, the diaphragm now moving freely. The serum-potassium report was 2·5 m.Eq. per litre (9·75 mg. per 100 ml.) instead of the normal value of 5 m.Eq. After her removal from the Drinker apparatus the girl's respiratory difficulty recurred and was again relieved by potassium. On her complete recovery from all symptoms five days later her serum-potassium was found to be 5·07 m.Eq. per litre.

Two years ago Brown and colleagues[2] recorded 3 cases of chronic nephritis in which attacks of paralysis occurred spontaneously and were relieved by potassium administration, but the analytical data were somewhat scanty. Though at the time the condition did not seem so well substantiated as in the report of Holler it seems probable that a similar syndrome was involved. On the other hand, as Allott and McArdle[3] pointed out, alkalosis from pyloric stenosis is often accompanied by extremely low serum-potassium levels, without any evidence of paralysis. The syndrome of low serum-potassium with alkalosis has been reported in Cushing's syndrome by Willson and colleagues,[4] and very low serum-potassium levels are observed after testosterone treatment; in both these conditions there is no paralysis.

---

[1] Medical Science Abused: German Medical Science as Practised in Concentration Camps and in the so-called Protectorate. Reported by Czechoslovak Doctors. Prague: Orbis. 1946. Pp. 92.

[2] Murder in Hospital. By "Josephine Bell." Penguin Books. 1941.

[1] Holler, J. W. *J. Amer. med. Ass.* 1946, 131, 1186.
[2] Brown, M. R., Currens, J. H., Marchand, J. F. *Ibid*, 1944, 124, 515.
[3] Allott, E. N., McArdle, B. *Clin. Sci.* 1938, 3, 229.
[4] Willson, D. M., Power, M. H., Kepler, E. J. *J. clin. Invest.* 1940, 19, 701.

Lately Darrow[5] has demonstrated that in experimental alkalosis with chloride deficiency there is a change in the muscle electrolytes, the potassium falling and being in part replaced by sodium. It seems likely that the solution of the problem why paralysis occurs in some conditions in which the serum-potassium is low and not in others must await further work on muscle electrolyte changes in these conditions. Allott and McArdle showed that the paralytic manifestations in familial periodic paralysis were not associated with a potassium diuresis but rather with a retention. So mere loss of potassium from the body is not the cause: the distribution of potassium within the body must be profoundly disturbed.

WISDOM FROM THE EGG

MICRO-ORGANISMS in general must still be studied collectively rather than as individuals, and by methods based on analogy, chance, or personal flair rather than directly on the natural host-parasite relationship. Thus the fact that most members of the genus salmonella ferment arabinose (a pentose derived from gum acacia), though interesting and useful, has little direct connexion with the problems of food-poisoning. It was by analogy that Rous and Murphy in 1911 came to use the techniques of the embryologists and showed that the fowl sarcoma could be transmitted to the developing embryo in the egg by means of a cell-free filtrate. Twenty years later Goodpasture and Woodruff succeeded in infecting the chorioallantois with the virus of fowl-pox. In the hands of Burnet and his school the technique was extended, and during the last twelve years inoculation of the developing egg with virus or rickettsia has been adapted for many purposes. The egg has advantages over the animal as an experimental subject. It is cheaper, smaller, and less liable to cross-infection; and it does not appear to harbour any natural virus infection. Inoculation may be into the embryo itself, or into the yolk-sac, the amnion, or chorioallantois, and some viruses will infect far more satisfactorily by one route than by any other. Infection of the chorioallantois often produces visible lesions which may be measured or counted, and the effects of antibodies or chemotherapy may thus be estimated quantitatively under conditions far easier to control than in an experiment involving animals.

The developing egg has already proved its value in the application of the newer knowledge of viruses and rickettsiæ to preventive medicine. Since viruses will not multiply on artificial media, one of the major difficulties in using them as prophylactic vaccines has been to concentrate sufficient volume of material in a form suitable for injection. The classical method, by the use of infected animal tissue, was used by Pasteur in anti-rabic prophylaxis, and by Nicolle and others in the preparation of anti-typhus vaccine. The fertile egg has been found to give higher yields of some viruses than can be obtained by any other method and has the added advantage that adventitious infection of all kinds can be excluded with reasonable certainty. The yellow-fever vaccine prepared in the chick embryo might well claim to have the widest social implications of any medical discovery of recent years. Whether the influenza vaccine prepared in the allantois is an effective prophylactic remains to be proved. Vaccination against smallpox with a pure strain of virus derived from culture on the chorioallantois is feasible, effective, and free from the risks of secondary infection. Virus from the developing egg has been shown to be a more satisfactory reagent for the Frei test in the diagnosis of lymphogranuloma inguinale than sterilised pus or mouse-brain suspension. Inoculation of the yolk-sac has been used by Cox in the preparation of rickettsial vaccines against epidemic and murine typhus and Rocky Mountain spotted fever.

The growth of viruses and rickettsiæ on the developing egg presents no great technical difficulties, and the monograph by Beveridge and Burnet,[1] just published, describes those practical devices without which the investigator in any new field must flounder until luck and perseverance teach him foolproof methods. The monograph reviews the history and present status of the technique in all its aspects, but says little or nothing of the future possibilities, though these must be far from exhausted—for example, in the experimental chemotherapy of virus infections, which is still in its infancy; and, since bacteria can be grown on the egg at least as well as on artificial media, in the rapid diagnosis of bacterial infections. This monograph originates from Australia, where much of the pioneer work on this subject has been done; it will make the bacteriologist in Britain view his empty egg-cup with increased regret.

ENDS AND BEGINNINGS IN INTERNATIONAL HEALTH

CONTRASTS between the old and new in international public health were apparent at what may be the last meeting of the Office International d'Hygiène Publique in Paris on Oct. 23, followed by the second session of the Interim Commission of the World Health Organisation at Geneva on Nov. 4.

The Permanent Committee of the Paris Office occupied itself chiefly with good-tempered arrangements for its own funeral. The director-general, Dr. Robert Pierret, offered his resignation to facilitate the transfer, and it was agreed that the work of epidemiological reporting, as well as some of the staff, should be transferred to the Interim Commission by the end of the year. When the protocol enters into force[1]—possibly about next March—formal transfer of the funds and other assets will take place. It seems likely that the assets of the Office will not exceed the ultimate liabilities for pensions, compensation, and the like, unless member countries pay up their arrears of contributions. True to a forty-year-old tradition the president of the Permanent Committee, Dr. M. T. Morgan, managed to obtain agreement even on the most controversial subjects, and no voting was necessary. Naturally the technical discussions were thrust somewhat into the background, but interesting papers were submitted, notably by Dr. P. G. Stock, Dr. Vollenweider, and Dr. G. Stuart on the "immune reaction" following anti-smallpox vaccination, by Dr. van den Berg on postvaccinal encephalitis, and by others on B.C.G., plague, and typhus.

Of the 18 members of the World Health Organisation's Interim Commission, 17 met in Geneva—only Dr. Medved of the Ukraine being unavoidably absent. Although a smaller body than the Permanent Committee of the Paris Office, it is still too large for the expeditious conduct of its business, and the meeting, scheduled to last for seven days, went on for ten. This was partly due to inevitable lack of experience of many of the delegates in this type of work, to translation delays, and to the birth-pangs of a new organisation, but an important cause was the natural desire of members to press for work to be undertaken or committees to be set up on the specialty or disease in which they happened to be personally interested. Fortunately, as Dr. Melville Mackenzie pointed out, the Interim Commission is precluded from dealing in its short life with anything except "urgent" health problems: but, even so, the secretariat has been given "an almost impossible burden" in addition to its statutory obligations such as those concerning the international sanitary conventions, the nomenclature of diseases and causes of death, the they are not encapsuled—the cells infiltrating slightly at the sites from which they arise. They are therefore not true neoplasms, and not analogous to uterine fibromyomas; and it seems questionable, at least, whether they have any right to retain their provisional title of tumours, even if that title is ascribed to them only by implication. This does not of course exclude the possibility that human fibromyomas may yet be found to be due to a hormonal derangement; but in that case the uterine fibroids would also lose their status in pathology as tumours and would become hormone-conditioned hyperplasias like the experimental hyperplasias of the pituitary which were once thought to be adenomas.

---

[5] Darrow, D. C. *Ibid*, 1946, 25, 324.

[1] Beveridge, W. I. B., Burnet, F. M. The Cultivation of Viruses and Rickettsiæ in the Chick Embryo, *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 256. H.M. Stationery Office. Pp. 92. 2s.

[1] See *Lancet*, Sept. 7, p. 358.

The discovery of these curious focal fibrous proliferations in guineapigs has been valuable in several ways. It suggested a possible cause of uterine fibroids that had not been thought of; it can be used in demonstrating what is and what is not a true tumour; and it provides in the guineapig a kind of indicator of hormone action and antagonisms. As regards these various uses, it must be admitted that we do not yet know what is the cause of uterine fibroids; and, while it is known that hyperplasias may become converted into true neoplastic tissue, there is no evidence of this happening in the guineapig lesion. As an indicator of action and reaction of the sex hormones of the guineapig these fibrous proliferations enable ingenious experiments to be done, and Professor LIPSCHUTZ in his lectures related a remarkable series. It is of course too early to predict what further knowledge this technique may reveal.

Annotations

A MORAL PROBLEM

NUREMBERG is to be followed by further trials, and among the first to answer charges of atrocious conduct will be some doctors who are said to have misused human beings in scientific experiments. The sort of crimes of which they are accused are described in a collection of narratives by medical survivors from internment camps in Czechoslovakia[1]; and the stories there told suggest a degree of degeneration which few would have thought possible in Europe. Having accepted the Nazi view that extermination of Jews and other enemies was necessary and legitimate, a number of doctors in concentration camps assisted in destroying these lives. From this it was but a step to persuade themselves that the men and women doomed to death should previously be employed as experimental material: if they were killed under controlled conditions—for example, by measured exposure to cold—data could be obtained which might later save the life of a good German soldier. Why should not science, and German arms, make use of this unusual opportunity?

From time to time during the past year or two we have been invited to publish or summarise, for the use of investigators, detailed reports of lethal experiments performed by Germans. None of these has seemed to us, on its merits, worth publicity; for the tests were generally ill conceived and ill conducted and the results no more informative than those already secured by other means. But supposing facts of real value to medicine were still to emerge from the records of the experiments—should they be published or not?

Opinion on this difficult ethical question is divided. Those who favour publication say that the crime has been committed, and that our duty both to the victims and to their surviving friends is to see that all possible advantage is gained from their sufferings, so that they shall not have suffered wholly in vain. If some good can come out of this horror, let it come. Those who would refuse publication argue, on the other hand, that the crime has been committed and that we should make ourselves accessories if we were to profit by it in any way. To do so, they believe, would make it slightly easier for someone in the future to justify another crime of the same kind; and the value of medical progress is as nothing weighed against the harm done to human values by promoting tolerance to systematic murder.

The problem was presented in simple form by a member of our profession in a novel published before the war.[2] Here a hospital doctor kills a patient so as to get information required in his researches—information which proves in fact to be of no small interest and value. After his suicide the hospital's medical committee faces the question whether this information is to be used. "May I remind you," says the chairman, "that our duty to our neighbour, our fellow man, comes before even our interest in science?"; and the papers are solemnly burnt. Now that the same problem may arise in real life, ought we to burn the papers? Or is this a case in which we should take the moral risk eternally involved in trying to extract good from evil?

POTASSIUM AND PARALYSIS

THE association of low serum-potassium with attacks of familial periodic paralysis has been recognised for some years, but there has been a conspicuous absence of authentic reports of paralysis associated with low serum-potassium in other conditions. An example has now been reported by Holler[1] in a diabetic girl of 18 years, admitted to hospital in coma. After the administration of 800 units of insulin in twenty-one hours ketosis was overcome, but respiratory paralysis supervened, so severe that the patient had to be put into a Drinker apparatus. Blood for serum-potassium was taken, but without waiting for the result 1·5 g. of potassium chloride was given intravenously, with great clinical improvement, the diaphragm now moving freely. The serum-potassium report was 2·5 m.Eq. per litre (9·75 mg. per 100 ml.) instead of the normal value of 5 m.Eq. After her removal from the Drinker apparatus the girl's respiratory difficulty recurred and was again relieved by potassium. On her complete recovery from all symptoms five day later her serum-potassium was found to be 5·07 m.E per litre.

Two years ago Brown and colleagues[2] recorded cases of chronic nephritis in which attacks of paralys occurred spontaneously and were relieved by potassiu administration, but the analytical data were somewh scanty. Though at the time the condition did not see so well substantiated as in the report of Holler it seem probable that a similar syndrome was involved. O the other hand, as Allott and McArdle[3] pointed out alkalosis from pyloric stenosis is often accompanied b extremely low serum-potassium levels, without an evidence of paralysis. The syndrome of low serum potassium with alkalosis has been reported in Cushing' syndrome by Willson and colleagues,[4] and very lo serum-potassium levels are observed after testosteron treatment; in both these conditions there is no paralysis

---

[1] Medical Science Abused: German Medical Science as Practised in Concentration Camps and in the so-called Protectorate. Reported by Czechoslovak Doctors. Prague: Orbis. 1946. Pp. 92.

[2] Murder in Hospital. By "Josephine Bell." Penguin Books. 1941.

[1] Holler, J. W. *J. Amer. med. Ass.* 1946, 131, 1186.

[2] Brown, M. R., Currens, J. H., Marchand, J. F. *Ibid*, 1944, 124, 515.

[3] Allott, E. N., McArdle, B. *Clin Sci.* 1938, 3, 229.

[4] Willson, D. M., Power, M. H., Kepler, E. J. *J. clin. Invest.* 1940, 19, 701.

Special Articles

CARE OF THE ELDERLY *

Lord AMULREE
M.D. Camb., F.R.C.P.

DURING the past few years the care of the elderly has assumed a particular importance in England, and it has been realised that their welfare propounds a problem that it will be difficult to solve. One hesitates to use these rather cold and impersonal words to describe what is essentially a human responsibility, and I should like to emphasise from the start that this is a matter from which the hand of the bureaucrat should be kept as far as is possible.

How to provide adequate living conditions for the elderly, and how to give them their proper place as essential members of the community, is likely to be the great social question of the future.

THE AGEING POPULATION

In the United Kingdom during the last forty years the average expectation of life has increased by 17 years for men, to an age of 61, and by 20 years for women, to an age of 67. In 1901 there were about 2,400,000 persons (1,100,000 men and 1,300,000 women) aged 60 or over, but by 1944 the number had risen to 6,300,000 (2,700,000 men and 3,600,000 women).

This change in the constitution of the population is partly attributable to differences in the birth-rate, but partly also to prevention of many of the great killing diseases, with healthier living conditions generally and a higher standard of living among poorer people. The successful prevention of disease, especially in the young and middle-aged, makes it likely that in the next fifty years patients admitted to acute hospitals will be drawn more and more from the higher age-groups.

In a short time—if indeed it has not already happened—the real workers, between 18 and 60 years of age, will form only 40% of the population. Economically, it would not be satisfactory for 40% to carry the other 60% as drones, and from this purely practical point of view, if from no other, old people must be preserved as working members of the community for as long as is possible. This does not, of course, mean that they should be encouraged or expected to undertake heavy manual work; but that they should do light work and be employed in other ways where their wisdom and experience can be used to the full seems to be as natural as it is desirable. That it can be done was shown during the late war, when many men, and women, continued to work for some years after they would normally have retired—and with little damage, but rather improvement, to their health.

WHERE TO LIVE?

Compared with former, and perhaps happier, times, many more old people are faced with the problem of how to carry on their daily routine. Increased taxation, smaller houses, and lack of domestic help—a factor of great importance—are compelling many of the elderly to seek assistance even though they are by no means destitute. And this loneliness is one of the terrible aspects of old age. In 1944 there were over half a million pensioners on the supplementary pensions list who were living alone (including of course those in hostels or boarding-houses), and 85,000 of these were over 80 years of age.

What are the alternatives now open to those who, through no fault of their own, find that they are unable to deal with their own housekeeping, or indeed to look after themselves adequately?

In the first place there are the public-assistance institutions. No-one can say that most of these are in any way satisfactory; their buildings are old and hideously decorated, with no human comforts, run under a lay administration with any number of encumbering and intimidating rules. There is, however, one valuable aspect of this system which must not be lost sight of in any impulse to sweep away the monstrous relics of the past. Those who are destitute, old, and ill can find a lodging in these institutions—a bed, food, and devoted nursing when it is needed. Granted that a lot, including the medical care, was bad; the system nevertheless has certain merits which must not be overlooked.

Then there are hostels and the like, mostly run by voluntary bodies, but a few by enlightened local authorities. Some of these are good, and some indifferent; but whatever their virtues or their faults their number is small, and they do no more than touch the fringe of the problem.

SOME REQUIREMENTS

One great difficulty has been that no-one has ever laid down the criteria necessary to make a satisfactory home for the elderly. For these are minimum requirements which apply no matter what type of building is selected.

It is probably a mistake to collect old people together into self-contained communities, unless these are situated in the middle of towns and unless there is complete freedom for the old to leave the home whenever they like and to receive visitors at any reasonable hour. In general the old enjoy the society of the young, and the young can learn much from contact with their elders. Plans for new blocks of flats or for housing estates do, from time to time, contain provision for a certain number of flats or houses specially made for the elderly. Rooms should if possible be on the ground floor; but, if this cannot be arranged, nothing higher than the first floor should be used and an easy staircase provided. The staircase should be well lighted, should have a handrail on each side, and should not be a spiral; if a turn has to be made this should be done by means of a half landing. In any building inhabited by the elderly, care must be taken that the stair-carpet is in good condition and not loose. Some 10% of fatal domestic accidents to people over the age of 60 can be traced to an accident on the stairs.

If possible floors should be made of some non-slip material. A hand-chain over the bath, which may be of the sitz type, is of advantage. Fires, whether open, electric, or gas, should be adequately protected—over 5% of fatal domestic accidents to people over 60 are due to burns from improperly protected fires. The house, or flat, should not be too large; a living-room with a curtained bed recess, a bathroom and kitchen, are usually all that an elderly person wishes to look after. A good example of such flats is to be seen at the Glasgow corporation's Crookston institution. The bed recess is important during the winter, because it enables the occupant to sleep in the same atmosphere as that in which he has spent the day, thus avoiding sudden chills. An internal w.c. should always be provided, and the coal store should open into the house.

When hostels are proposed, care must be taken that each person has the possibility of as much privacy as he desires. While it is true that the old feel lonely, they do not always want to pass all their time in full public view. Single rooms are of course the ideal; but where this is impossible, small wards, or rooms, of not more than six beds (preferably less), should be provided. By the skilful use of screens and curtains the beds can usually be arranged so that inmates can retire into their own world from time to time. It is a great advantage for the occupants of hostels to bring their own furniture and belongings. Personal possessions acquire an increased value with old age, and their continued presence goes

---

* A paper read at the opening session of the Anglo-Swiss Medical Conference at Basle, 1946.

control of narcotics, and biological standardisation. *Yet tuberculosis, the outstanding problem in world* health at the present time, was hardly mentioned. Underlying this problem is an important point of principle, since it involves the question how far the members of the Interim Commission, who are nominated by governments in their personal capacity, are responsible to, and should receive instructions from, their own governments. It was evident that some members consider themselves primarily as representatives of their countries, while others clearly spoke for themselves alone; and although the point was raised by Dr. Mani (India) it was not specifically discussed. The narrower functions of the Paris Office make possible a dichotomy, delegates speaking under instructions in administrative matters concerning the conventions and personally on scientific matters; but in bodies such as the old Health Committee of the League of Nations, and the Interim Commission, which have wider powers of spending money on the initiation of work, such a distinction is probably impracticable. It may be that a mixture of responsible and irresponsible members—of civil servants and "rash, inconsiderate, fiery voluntaries"—is not only inevitable but desirable; but more will certainly be heard of the question.

Among the important decisions taken was one to accept UNRRA's generous offer of 1½ million dollars—half as much again as the commission's budget for 1947. It will be used in the first place to continue certain aspects of UNRRA's health work, including medical fellowships, the programmes in China and Ethiopia, and the control of tuberculosis and malaria: meanwhile governments of countries receiving aid from UNRRA will be asked to review their needs, so that the programme for spending the balance of the money can be revised. This should bring to the Interim Commission and the World Health Organisation additional strength by adding practical field work to their more academic responsibilities, as well as partially salving many consciences dismayed by the premature ending of UNRRA's activities. But how far governments will wish to accept expert advice unaccompanied by more tangible aid remains to be seen.

A stubborn debate took place on whether the headquarters of the Interim Commission should remain in New York or be transferred to Geneva, with a liaison office in the United States. An eloquent plea for Geneva by the executive secretary, Dr. B. Chisholm, on grounds of practicability and cost, was supported by the chairman, Dr. A. Stampar, and (as regards epidemic notification and the transfer of UNRRA work) by Dr. N. M. Goodman, the observer for UNRRA. But the commission felt that the more intangible considerations in favour of a New York headquarters were of paramount importance, and a vote on a compromise motion to retain headquarters there but establish a regional office in Geneva to deal with epidemiological reporting and the UNRRA field work in Europe revealed only two dissentients, Dr. Cavaillon and Dr. Krotkov, the members from France and the U.S.S.R. The next meeting of the Interim Commission is scheduled for March 31 in Geneva, and meanwhile the secretariat will have to increase its staff to deal with its new responsibilities.

DROWSINESS FROM BENADRYL

THE drug 'Benadryl' (β-dimethylaminoethyl benzhydryl ether hydrochloride) has anti-allergic properties and also an anti-histamine action which enables it to relieve spasm of smooth muscle.[1] It is given by mouth in capsules of 50 mg., the average adult dose being one to four capsules daily. It has been used with great success in urticaria, angioneurotic œdema, erythema multiforme, and hay-fever; and Willcox[2] has shown that the urticaria which occasionally follows penicillin therapy also responds well. It is not, however, without toxic effects, the most prominent being drowsiness, and Slater and Francis[3] describe a case in which an accident resulted from this symptom. A hay-fever patient took a 50 mg. capsule of benadryl at 7 A.M. and complained of feeling drowsy on starting work at 8 A.M. An hour later, while driving an electric platform cargo truck, he lost control and jumped off the truck. He was not hurt, but the truck ran off the platform and was wrecked.

More than half the patients taking benadryl notice slight drowsiness, and a few sleep for anything up to 18 hours at night, though this effect usually wears off in a day or two. When drowsiness is severe the dose may be reduced to 10–20 mg. A possible alternative would be to give amphetamine ('Benzedrine') in doses of 5 or 10 mg at the same time. In the treatment of epilepsy it has been found that large doses of phenobarbitone (e.g., gr. 3 daily), which alone produce intolerable drowsiness, will still have the same effect on the fits if given in conjunction with amphetamine, though their hypnotic action is much reduced.

WELFARE OF THE DEAF

DEAFNESS in early childhood is not always easy to detect, and it is often difficult to decide whether a child's failure to develop normal speech is due to deafness or to mental retardation. Ascertainment at an early age is extremely important because the deaf child can acquire speech and language only by expert teaching, and until he has done so no other education is practicable. Under the Education Act, 1944, the parent of a deaf child can ask the local education authority to provide special education for his child from the age of two years, and an increasing number of parents are applying for these facilities. Unfortunately, however, the schools for the deaf are still suffering from war-time interruptions. Several of the largest of them, which were evacuated from dangerous areas, are only just beginning to settle down in their original premises. Most of the schools are residential and have had great difficulties in securing adequate domestic staff. The total number of trained teachers of the deaf is comparatively small so that the claims of the Armed Forces inevitably hit some schools hard. The training of teachers for so highly skilled a profession takes time, and there is still a shortage of suitable premises. The development of group hearing-aids for teaching purposes, which had made a good start before the war, was held up by difficulties of supply and maintenance. The solution of these problems is not a matter of weeks or even of months, but, in reply to an eloquent appeal by Mr. Edward Evans in the House of Commons on Nov. 20, reported on another page, Mr. Key, parliamentary secretary to the Ministry of Health, assured the House that the Minister of Education was urging local education authorities to make more provision for deaf children, and that conferences were being held to consider the erection of new schools and the extension of existing ones.

Three committees of the Medical Research Council are at work on different aspects of deafness. Most has been heard of the Electro-Acoustics Committee, which is concerned with the design of a hearing-aid which will be provided and maintained free of cost under the National Health Service. The two other committees are studying medical and surgical questions and the educational aspects. The findings of these committees will no doubt be valuable, but the various problems of deafness need for their solution the coöperation of doctors, physicists, educationists, and social workers. Doctors can help by ensuring that every child who develops otitis media receives early and efficient treatment, and by encouraging the parents of deaf children to seek the aid of the local education authority as soon as possible.

---

[1] See *Lancet*, 1946, i, 425.

[2] Willcox, R. R. *Brit. med. J.* Nov. 16, p. 732.

[3] Slater, B. J., Francis, N. *J. Amer. med. Ass* 1946, 132, 212.

medicine in Baltimore. In addition, the delegation met representatives of the council on medical education and hospitals of the American Medical Association in Chicago, and of the National Board of Medical Examiners in Philadelphia.

"From all these bodies the delegates obtained valuable information as to the requirements for medical practice, the content and layout of the medical curriculum, and the views of those who would amend the existing regulations."

A preliminary report on the visit would be presented during the session, when the council would have to consider the draft recommendations in the light of observations made on them by licensing bodies and medical schools; but since replies had not been received from a number of bodies and schools it would probably be necessary to have an additional session in February for adoption of the recommendations in their final form.

At their May meeting the council approved the draft of a short Medical Bill restricted in its scope to matters which in their opinion urgently required legislation. Copies of the draft and of an explanatory memorandum were transmitted to the Minister of Health and to the Lord President of the Council on Sept. 21, with a submission that the Bill should be settled by the Government draftsman with a view to its introduction, as settled, into Parliament at the first opportunity.

YES OR NO?

FURTHER COMMENTS

LAST week we published extracts from published comments on the British Medical Association's plebiscite. The following is a further selection:

Sir ALFRED WEBB-JOHNSON (*president of the Royal College of Surgeons of England*):

I hope that all practitioners will give this question most serious consideration. I trust that they will not lightly make it difficult for the responsible leaders of the profession to enter into negotiations in which the Minister is now at liberty to take part.

It must be borne in mind that a vote in favour of discussions with the Minister does not register approval of the Act in every detail. A vote in favour of discussions does not commit any practitioner to accepting service under the Act.

There are parts of the Act which, in the judgment of the majority of the profession, will not give the public the best service. But the Act probably pleases no-one entirely. There are obvious dangers to be guarded against.

Discussions will, however, provide opportunities for negotiation on many points which still need clarification in spite of the debates in Parliament. They will also provide opportunities for helping to plan most of the machinery of the service, and to mould much of the policy which remains to be settled by regulations.

Dr. GUY DAIN (*chairman of council, B.M.A.*):

Mr. Souttar accuses the B.M.A.'s leaders of "blind opposition" to the Health Act, when in fact they are adopting the most democratic step open to them—that of taking the opinion of the whole profession, an opinion that through the plebiscite will determine all future action. He says that the medical profession will never refuse to serve the nation. Of course it will not. But it has the right to determine by its own faith and conscience whether the Act can in fact be made to work in the best interests of the people. (*Times*, Nov. 20.)

Dr. CHARLES HILL (*secretary, B.M.A.*):

Let me make it clear, with all the emphasis I can, that whatever the result of this plebiscite the medical profession's services to the sick and the suffering will not be diminished in the smallest degree. No patient in this country is going to have one bottle less medicine, one minute less of care and attention, on account of the doctors' little disagreements with the present Minister of Health. . . .

Nor, again, is it either true or fair to pretend that this plebiscite is (in some unexplained fashion) disloyal or "seditious," to argue that the B.M.A. is "challenging the authority of Parliament" by organising it. We are not yet faced in this country, thank God, with the alternative of signing on the dotted line or going to prison, the choice (let us say) between "Bevan or Belsen."

All doctors are expressly left free by the Act itself to choose whether to come into the new Health Service or not. . . .

No, the "supremacy of Parliament" is being insidiously and corrosively tampered with by people other than the B.M.A. One of the many reasons why doctors dislike this Act is that it is the worst sample yet seen in England of delegated legislation, of the fatal temptation to leave the making of law to the bureaucrat. . . .

This ill-judged scheme hurriedly rushed through Parliament is not a proper Statute at all. It is not even an "Enabling Act." It is just a Sahara of blank spaces in which a temporary political office-holder may scrawl anything. That is the ugly fact behind the much-advertised vision of a "free health service for everybody."

That is the issue this plebiscite will test. Naturally, and rightly, doctors are being told what their professional leaders think of the Act as it now stands. But the illusion, sedulously fostered by opponents, that the average doctor would be quite willing to work with Mr. Bevan if it were not for the intrigues of some mysterious clique or "faction" at the B.M.A has no foundation in fact. (*Evening Standard*, Nov. 20.)

Sir WILLIAM GOODENOUGH and Sir JOHN STOPFORD, F.R.C.P., F.R.S.:

It is not for us to interfere in any way in the internal affairs of the medical profession, we are concerned not with medical practice but with university and hospital administration. Nevertheless, because of these concerns, the future of the health service is a matter of vital importance to us and to the patients and students whom we serve, and this future depends upon the attitude towards the service of the doctors and others by whom it will be operated. . . .

It seems to us that if the profession decide now not to take part in any discussion with the Government, they will be forfeiting their right to share in the shaping of the new service and will be deciding in advance to reject the scheme which has been approved by Parliament before they have any knowledge of what that scheme in fact will be. We earnestly hope that our medical colleagues will not take hastily so rash a decision but will join with the Government and with all others concerned to discuss how best the Act can be translated into an effective health service. (*Times*, Nov. 25.)

BRITISH AND AUSTRALIAN MEDICAL SERVICES COMPARED

FROM OUR AUSTRALIAN CORRESPONDENT

"THE panel system in Britain has broken down so completely that the Government has been forced to bring out a new scheme," said Dr. A. W. Chambers, an Australian doctor who has just returned after nine years in England and Scotland. "The standard of the medical profession in Britain today is high, except for general practitioners, who have deteriorated considerably because they have not the time to bring themselves up to date," he is reported as saying.

"Patients in public hospitals in Britain paid according to their means. There was nothing comparable to the six shillings a day subsidy for hospital patients paid by the Australian Government.

"Britain was far behind Australia in maternal care. Many children were still delivered in the mother's home with the aid of a certified midwife. Every British mother did not receive a maternal benefit as in Australia.

"Only the working girl, a contributor to the National Insurance Scheme, received a grant of less than £5 for her confinement if a child was born to her within a certain time of her leaving work."

In Australia, since 1943, a mother has received £15, £16, or £17 10s. according to whether there are none, one or two, or three or more other children under 14 in the family.

AUSTRALIA'S NATIONAL HEALTH SCHEME

It may be of interest to British readers to recall that Australia has a National Health Scheme which passed both houses of parliament in 1938 but has never been put into operation.[1] The scheme was compulsory, but did not cover everyone. It was limited to employees, other than public servants, having an income of less than £7 per week. In 1939 the scheme would have applied to only a quarter of the population of Australia.

---

[1] *Lancet*, 1938, i, 1463; 1939, i, 778.

a long way towards relieving the sorrow natural upon giving up a home. There are some old people who prefer to share a bedroom; they feel lonely and frightened at night and enjoy the feeling of someone in the room.

LESSONS FROM CHELSEA AND FRANCE

One of the best provisions made for the elderly in Great Britain is the Royal Hospital, Chelsea, founded by King Charles II for Army pensioners.

Here about 600 men, ex-Regulars of good conduct, are housed in large wards. But each pensioner has a cubicle of his own, containing his bed, chest-of-drawers and chair, into which he can retire and shut the door. The ward is large, with plenty of space, light, and air. There is a large open coal fire, with arm-chairs, while at one end is a small stove where any of the pensioners can cook a sausage, or the like, if he so wishes. This is of course in addition to his regular meals. Each pensioner is given a monetary allowance for beer and tobacco; and he can leave the building more or less as he likes. He also has at least three suits—a scarlet one for Sundays and feast-days, a blue one for ordinary days, and a fatigue dress for wearing in the hospital.

The beer-and-tobacco allowance, together with a wardrobe of reasonable size, go a long way towards making the lives of these men appear as normal as possible. Too often an atmosphere of quite unnecessary restriction surrounds such institutions; any attempt to indulge in mild human weaknesses or pleasures is regarded as improper, and the unfortunate inmate is treated as if his poverty and helplessness were a crime. It is a gloomy commentary on the progress of mankind that the best institution of this kind in England dates back 350 years.

Attached to this hospital is an infirmary where pensioners can go when they are sick of mild or minor diseases (for anything serious they are sent to a military hospital) or where they can be permanent inmates when they become feeble. During the war the infirmary was removed to a large house in the country, where the pensioners enjoyed the benefits of a beautiful garden and park, as well as immunity from bombs. The old gentlemen were, however, completely miserable, and only longed to return to London. The house was about two miles from a small country town—too far for them to walk, or for their friends to pay them visits. They missed the noises of the town, the sight of the traffic, and the feeling of being a member of a vast community. This experience has been instructive, for it is often suggested that large country houses might be converted into homes for the elderly. We must recognise that in general old people need to be kept in touch with the community, where their friends and relatives can see them with ease and where they still have the surroundings they have always known: otherwise there will be no contentment in their old age. Their life is contracting, and what is still left is doubly precious on that account.

In France great attention has been paid to the care of the aged for many years. The Assistance Publique, the central authority which controls all but a small number of the hospitals, is responsible for providing accommodation and care for old people. Under this authority homes, which may be roughly divided into three categories, are available—those who can afford to pay a sum equivalent to approximately £1 a week at the present rate of exchange can obtain a large bed-sitting-room furnished by themselves in one of the many *maisons de retraite*. Here medical attention, under the hospital authority, is available, food is served in a common dining-room, and there are practically no rules governing the institution. For those who cannot afford this sum, smaller rooms, *petits ménages*, are available in large institutions, which are equally free from tiresome restrictions. And even the paupers, housed in large dormitories in somewhat old-fashioned institutions, or hospices, are allowed a degree of freedom which compares favourably with tha enjoyed by inmates of our public-assistance institution But, from the medical point of view, the most importan fact is that the healthy aged are cared for by the sam authority as the sick, and there is, therefore, no administrative barrier fixed between these two inseparable type of old people.

Any arrangements made for the care of the elder in hostels, homes or institutions must include a clo link with a hospital. Old people develop mild disease notably respiratory or cardiovascular, which prom care will often cure in a short time, whereas neglect m lead to catastrophe. The aged do not react to infecti as vigorously as the young, and apparently trivi symptoms may mask a serious condition. It is tr that the old frequently object strongly to removal hospital, because they have a secret fear that they w never leave. An efficient hospital service can in tin overcome that fear; when they see their friends returnin from hospital, improved in health, if not cured entirel they no longer regard their own transfer to the hospit as the first step to the tomb.

At present elderly persons who become ill are ofte taken away from home to some institution, where the are put in a ward for the chronic sick. Here they l until they die—receiving no proper medical investigatio or treatment—and are made unnecessarily bed-fas Then life becomes miserable and cramped, and the occupy valuable beds which are required for oth purposes.

AN UNPAID DEBT

What I have been saying is obvious once it comes t the mind.

We have already made great strides with the improv ment of conditions for infants and young children, an this has paid handsomely. Let us now turn our attentio to the old, who, having worked all their lives, can pay n dividend: in fact it is we who owe them much. Thei plight is desperate.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

OPENING the 169th session on Tuesday last Sir HERBER EASON, the president, spoke with deep regret of th death of Sir Kaye Le Fleming—a direct representativ for England and "an outstanding example of famil physician and friend"—and of two former members o the council, Sir Walter Langdon-Brown and Dr. Wardro Griffith. Dr. Thomas Fraser, the direct representativ for Scotland, has retired after five years' valued servic and Dr. R. W. Craig, former Scottish secretary of th British Medical Association, has taken his place. Mr Duncan Macgregor has been appointed by the Priv Council to be an additional member of the council unde the Dentists Act, 1921.

At their meeting in May, continued the president, th council decided that in the consideration of their draf recommendations as to the curriculum a stage had bee reached when it might be desirable to consult some o those concerned with the medical curriculum in Canad and the United States.

"Thanks to the generosity of the Nuffield Foundation, who defrayed the cost of transport across the Atlantic, and of the Rockefeller Foundation, who defrayed the cost of living in the New World, this aspiration was fulfilled, and in the middle of September a delegation from the council, consisting of Dr. Bigger, Dr. Brocklehurst, Dr. Campbell, Dr. Cohen, and myself, with the registrar, crossed the Atlantic and visited the following medical schools: in New York the Long Island college of medicine, Cornell University medical college, New York University college of medicine, and Columbia University college of physicians and surgeons; the University of Chicago; the University of Michigan medical school, Ann Arbor; in Canada, the faculties of medicine in the University of Toronto and in McGill University; the Harvard University medical school in Boston; and the Johns Hopkins University school of

LEEDS

County of York, E. Riding.

County of York, N. Riding (except area in Newcastle region).

County of York, W. Riding (except area in Sheffield region).

County boroughs of Kingston-upon-Hull; York; Bradford, Dewsbury, Halifax, Huddersfield, Leeds, and Wakefield.

SHEFFIELD

Counties of Derby (except area in Manchester region), Leicester (except Hinckley U.D.), Lincoln (Parts of Holland, Parts of Kesteven except area in Cambridge region), and Parts of Lindsey, Nottingham, and Rutland (except Ketton R.D.).

County boroughs of Derby; Leicester; Grimsby and Lincoln; Nottingham.

County of York, W. Riding (C.B.s of Barnsley, Doncaster, Rotherham, and Sheffield; borough of Goole; U.D.s of Adwick le-Street, Bentley with Arksey, Conisborough, Cudworth, Darfield, Darton, Dearne, Dodworth, Hoyland Nether, Maltby, Mexborough, Penistone, Rawmarsh, Royston, Stocksbridge, Swinton, Tickhill, Wath-upon-Dearne, Wombwell, and Worsborough; R.D.s of Doncaster, Goole, Kiveton Park, Penistone, Rotherham, Thorne, and Wortley).

County of Stafford (Burton-on-Trent C.B. and Tutbury R.D.).

CAMBRIDGE

Counties of Bedford (except area in N.W. London region), Cambridge, Huntingdon, Isle of Ely, Norfolk, Soke of Peterborough, Suffolk East, and Suffolk West.

County boroughs of Great Yarmouth and Norwich; Ipswich.

County of Essex (Saffron Walden B. and R.D.).

County of Herts (Royston U.D.).

County of Lincoln (Parts of Kesteven) (Stamford B., Bourne U.D., South Kesteven R.D.).

County of Rutland (Ketton R.D.).

LONDON

North-west

Counties of Bedford (Luton B. and R.D., Dunstable B., Leighton Buzzard U.D.), Bucks (boroughs of Chepping Wycombe and Slough; U.D.s of Beaconsfield, Chesham, Eton, and Marlow; R.D. of Amersham, Eton, and Wycombe).

Berks (boroughs of Maidenhead and New Windsor; R.D.s of Cookham, Easthampstead, and Windsor).

Herts (except areas in Cambridge and N.E. London regions).

Middlesex (except area in N.E. London region).

London (Hammersmith (north of Goldhawk Road and Stamford Brook Road), Hampstead, Holborn, Islington, Kensington (north of Holland Park Avenue, Notting Hill Gate, and Bayswater Road), Paddington (north of Bayswater Road), St. Marylebone, St. Pancras, Westminster (north-east of Park Lane, north of Constitution Hill, Birdcage Walk, Great George Street, and Bridge Street).

North-east

Counties of Essex (except area in Cambridge region); Herts (Hertford B., U.D.s of Bishop's Stortford, Cheshunt, Hoddesdon, Sawbridgeworth, Ware; R.D.s of Braughing, Hertford, and Ware); Middlesex (Edmonton B., Tottenham B., Enfield U.D.); London (Bethnal Green, City, Finsbury, Hackney, Poplar, Shoreditch, Stepney, Stoke Newington).

County boroughs of East Ham, Southend-on-Sea, and West Ham.

South-east

Counties of Kent and East Sussex; London (Bermondsey, Camberwell, Deptford, Greenwich, Lambeth (east of Kennington Park Road, Brixton Road, and Brixton Hill), Lewisham, Southwark, Woolwich).

County boroughs of Brighton, Canterbury, Eastbourne, and Hastings.

South-west

Counties of Surrey and West Sussex.

Hampshire, Isle of Wight, Dorset (except area in Bristol region), Wilts (boroughs of Salisbury and Wilton; R.D.s of Amesbury, Mere and Tisbury, and Salisbury and Wilton).

London (Battersea, Chelsea, Fulham, Hammersmith (south of Goldhawk Road and Stamford Brook Road), Kensington (south of Holland Park Avenue, Notting Hill Gate, and Bayswater Road), Lambeth (west of Kennington Park Road, Brixton Road, and Brixton Hill), Paddington (south of Bayswater Road), Wandsworth, Westminster (south-west of Park Lane, south of Constitution Hill, Birdcage Walk, Great George Street, and Bridge Street)).

County boroughs of Bournemouth, Croydon, Portsmouth, and Southampton.

OXFORD

Counties of Berkshire (except area in N.W. London region), Buckingham (except area in N.W. London region), Northampton, and Oxford.

County boroughs of Northampton, Oxford, and Reading.

BRISTOL

Counties of Cornwall, Devon, Gloucester, Somerset, and Wilts (except area in S.W. London region).

County of Dorset (boroughs of Bridport and Lyme Regis; Sherborne U.D.; R.D.s of Beaminster, Bridport, and Sherborne); Isles of Scilly.

County boroughs of Bath, Bristol, Exeter, Gloucester, and Plymouth.

CARDIFF

The whole of Wales and Monmouth.

BIRMINGHAM

Counties of Hereford, Leicester (Hinckley U.D.), Salop, Stafford (except Burton-on-Trent C.B. and Tutbury R.D.), Warwick, and Worcester.

County boroughs of Birmingham, Coventry, Dudley, Smethwick, Stoke-on-Trent, Walsall, West Bromwich, Wolverhampton, and Worcester.

MANCHESTER

Counties of Cheshire (except area in Liverpool region), Lancashire (except area in Liverpool region), and Westmorland (except area in Newcastle region).

County of Derby (boroughs of Buxton and Glossop, U.D.s of New Mills and Whaley Bridge, and R.D. of Chapel-en-le-Frith).

County boroughs of Barrow-in-Furness, Blackburn, Blackpool, Bolton, Burnley, Bury, Manchester, Oldham, Preston, Rochdale, Salford, and Stockport.

LIVERPOOL

County of Cheshire (C.B.s of Birkenhead, Chester, and Wallasey; boroughs of Bebington, Congleton, and Crewe; U.D.s of Alsager, Ellesmere Port, Hoylake, Hoole, Knutsford, Lymm, Middlewich, Nantwich, Neston, Northwich, Runcorn, Sandbach, Winsford, and Wirral; R.D.s of Bucklow, Chester, Congleton, Nantwich, Northwich, Runcorn, and Tarvin).

County of Lancashire (C.B.s of Bootle, Liverpool, St. Helens, Southport, Warrington, and Wigan; boroughs of Crosby and Widnes; U.D.s of Abram, Ashton-in-Makerfield, Aspull, Billinge and Winstanley, Formby, Golborne, Haydock, Hindley, Huyton with Roby, Ince-in-Makerfield, Litherland, Newton-le-Willows, Ormskirk, Orrell, Prescott, Rainford, Skelmersdale, Standish with Langtree, and Upholland; R.D.s of Warrington, West Lancashire, Whiston, and Wigan).

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED NOV. 16

Notifications.—Smallpox, 0; scarlet fever, 1293; whooping-cough, 1696; diphtheria, 330; paratyphoid, 26; typhoid, 7; measles (excluding rubella), 4382; pneumonia (primary or influenzal), 625; cerebrospinal fever, 30; poliomyelitis, 15; polioencephalitis, 2; encephalitis lethargica, 3; dysentery, 70; puerperal pyrexia, 141; ophthalmia neonatorum, 60. No case of cholera, plague, or typhus was notified during the week.

The number of Service and civilian sick in the Infectious Hospitals of the London County Council on Nov. 13 was 957. During the previous week the following cases were admitted: scarlet fever, 57; diphtheria, 31; measles, 22; whooping-cough, 35.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from measles, 1 (0) from scarlet fever, 9 (1) from whooping-cough, 7 (0) from diphtheria, 63 (6) from diarrhœa and enteritis under two years, and 16 (3) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 11 deaths from diarrhœa and enteritis, Manchester 9.

The number of stillbirths notified during the week was 297 (corresponding to a rate of 33 per thousand total births), including 48 in London.

The scheme was based on the insurance principle, with contributions from employees, employers, and the government. The contributions were fixed at 3*s*. per week for men and 2*s*. for women, with employers contributing similar amounts on account of each employee. There was no means test.

The benefits were: medical treatment, medicines, and drugs; sickness benefits (males 20*s*., females 15*s*., and dependent children 3*s*. 6*d*. weekly, for maximum of 26 weeks); disablement pension (males 15*s*., females 12*s*. 6*d*.); old-age pensions (males 20*s*., females 15*s*.); widows' pensions (12*s*. 6*d*., rising to 15*s*. by 1944); orphans' pensions (7*s*. 6*d*. if last parent insured). A comparison with the Beveridge plan showed that Australian contributions would have been two-thirds of the British, but the benefits would have been proportionately less.

Why was the scheme abandoned? First, it was out of step with the individualistic Australian temperament. Medical practice in Australia in 1938 was very different from that of Britain in 1938. Much more so from that in Britain in 1911. Sir Walter Kinnear, who framed the Australian scheme on British lines, was not sufficiently influenced by the leaders of the friendly societies in Australia. Secondly, although the federal executive of the British Medical Association had agreed to a capitation fee of 11*s*. a year, and had agreed to a pledge of secrecy until the Bill had been presented to Parliament, there was widespread criticism from the rank and file of B.M.A. members.

The Bill was finally passed on the promise that a Royal Commission would recommend a capitation fee, the scope of treatment, and travelling expenses. But even this action did not still the criticisms that (*a*) remuneration on the basis of an annual capitation fee was much too low, and an insurance doctor would be forced to increase the number of his panel patients at the expense of his professional efficiency; (*b*) no provision was made for mothers and children or for the unemployed, the small-scale employers, and self-employed persons; (*c*) no provision was made for hospital services, specialist services, preventive medicine, for regulation of medical working hours, or for better distribution of doctors to places where their services are needed, but which were economically unattractive; (*d*) there was no coördination between clinical treatment and hospital and health services.

Thirdly, employers, employees, friendly societies, feminists, and farmers all had various objections to the Bill. The shadow of war was beginning to fall; a record defence expenditure was in the budget, and there was a widespread drought in the country. If a last straw had been needed it was the tragic crash of an air-liner which was conveying most of the members of the Royal Commission. There were no survivors of this crash, which also destroyed most of the important documents of the commission.

As late as 1943 a parliamentary joint committee on social security announced sentence. "On the evidence submitted there is," they said, "unanimous objection to national health insurance as contained in the Commonwealth National Health and Pensions Insurance Act, 1938. Special attention has been directed to the restriction of benefits to a particular income group, to the very limited health and social benefits, and to the absence of any provisions covering the dependants of an insured person. . . . Generally it is our opinion that the National Health and Pensions Insurance Act falls far short of any plan of social security adequate for the people of Australia, and this Committee does not favour the principle of national insurance for such a purpose. In view of the overwhelming weight of evidence we strongly advise that no action be taken to implement any of the provisions of this legislation in its present form."

Dr. G. Matthew Fyfe, M.O.H. for Fife, is to represent the Scottish branch of the Society of Medical Officers of Health on the advisory committee set up under the Scottish Water Act, 1946.

Dr. Catherine B. Crane has been appointed medical officer of health for the city of York, in succession to the late Dr. P. R. MacNaught, whom she served as deputy. According to the *Medical Officer* of Nov. 23, Dr. Crane is the first woman to receive the full appointment of M.O.H. for a county borough.

Reconstruction

THE REGIONAL AREAS

MINISTRY'S PROVISIONAL PROPOSALS

UNDER the National Health Service Act the Ministe of Health is required to determine the areas to be covere by the regional hospital boards administering th hospital and specialist services. So far as possible thes areas are to be such that the services can convenientl be associated with a university having a medical school and in determining their extent the Minister mus consult the bodies and organisations which appear t him to be concerned.

Accordingly Mr. Bevan has now prepared a statemen of his provisional views and has asked a wide range o professional and other bodies for their observations—to reach him by Dec. 15.

In so doing he points out that the size and extent o the areas must be determined primarily by their purpose "which is to provide an area adapted rather for th planning, coördination, and provision of hospital and specialist services than for the control and management of hospitals. The latter task will . . . be the function o hospital management committees. It follows that th areas can and should be comparatively large in population, and such that each has a natural university medical centre as a focal point."

In certain regions geographical or other circumstances "appear to render it necessary that for part of the area there should be set up a regional committee of the board with delegated powers and its own offices. The Minister has in mind such areas as Devon and Cornwall; Hampshire, Dorset, and Isle of Wight; North Lancashire and South Westmorland; and Cumberland and North Westmorland."

The boundaries of regional areas need not and will not prevent the free passage of patients from one area to another. "Indeed in some instances at the outset regional boards will become responsible for hospitals, &c., in their area which have belonged to and served communities in other areas, and which must continue to do so." However, the Minister thinks that wherever possible the boundaries of the regional areas should coincide with those of local health authorities, so as to secure the maximum of administrative efficiency. Except where other considerations must in his view clearly prevail, the proposed boundaries accordingly follow those of counties and county boroughs. "In some instances it appears that other important factors (e.g., association of the services with the appropriate medical schools, grouping of related hospitals under the same regional board) make it essential to cross local health authority boundaries in defining the boundaries of regional board areas. Here again the Minister has sought wherever possible to ensure that the proposed boundaries shall coincide with those of boroughs or county districts."

The following notes show the 14 proposed areas, grouped round 11 universities. It will be noted that London University is related to four regions.

NEWCASTLE

Counties of Cumberland, Northumberland, and Durham.

County boroughs of Carlisle; Newcastle-upon-Tyne and Tynemouth; Darlington, Gateshead, South Shields, Sunderland, and West Hartlepool.

County of Westmorland (Appleby B. and North Westmorland R.D.).

County of York, N. Riding (Middlesbrough C.B.; boroughs of Redcar, Richmond, and Thornaby-on-Tees; U.D.s of Eston, Guisborough, Loftus, Northallerton, Saltburn and Marske, and Skelton and Brotton; and R.D.s of Croft, Northallerton, Reeth, Richmond, Startforth, and Stokesley).

Letters to the Editor

REGIONAL BOARDS

SIR,—Sir Leonard Parsons and Sir Ernest Rock Carling have written most valuable letters on regional affairs.

A comment, however, seems called for on Sir Leonard Parsons's use of the words "administration" and "policy," which I think has also puzzled Sir Ernest Rock Carling. Referring to your leading article of Nov. 9, Sir Leonard Parsons asks whether you are right in assuming that the function of the regional boards is primarily one of administration. He says that in his view the boards should be concerned with "policy" whilst "administration" should be delegated to the hospital management committees. It is a misfortune that our terminology for dealing with such matters is so lacking in precision. One could be forgiven for supposing that "administration" and "policy" in this context were synonyms and not opposites—i.e., that policy means major questions of administration. And one would have thought that if the board were concerned with "policy" the implication would be that it should be predominantly lay and served by a lay chief executive officer as in the case of the board of a hospital.

Sir Leonard Parsons, however, argues that the prime concern of the regional board—its policy—should be to organise the best possible facilities for treatment, and he draws the conclusion that "it would follow" that the primary qualification of the chief executive officer of the board should be his "intimate knowledge of the medical aspects of hospital care." I hope this is a fair summary of his argument. In regard to the object of the board, one can whole-heartedly agree: in regard to method, and the question whether the objective is best achieved by a medical chief executive officer, there is room for difference of opinion.

The trouble is surely this: that if professional ability could really be brought to bear in the simple way Sir Leonard Parsons suggests, all would be plain sailing. There would in fact be no need for a regional board or of a medical advisory committee at all. A medical man acting as a commissioner would suffice. But in actual fact this is not the case: medical men differ as to what ought to be done, and a lay decision has to be taken somewhere and by somebody as to the allocation of monetary resources: hence the need for the machinery of the medical advisory committee and lay governing body on the lines on which it has evolved in our hospitals.

Sir Ernest Rock Carling suggests that in the matter of the chief executive officer there should be experiment—some regions trying a medical man and others a layman, if the right individuals can be found. The danger of the medical chief executive officer is not that he will be a worse servant to the board than the layman of corresponding experience and ability, but that he may arrogate to himself the functions of the medical advisory committee and ultimately render it an ineffective appendix to his own conception of "the medical aspects of hospital care." This is a real and serious danger which might well lead to a blurring of the distinction between lay "policy" on the one hand, and professional advice on the other. Policy and politics are not far apart, and it is of overriding importance that the profession should keep a firm grasp of its advisory relationship to the machinery of policy.

YOUR CORRESPONDENT OF NOV. 9.

CORONARY DISEASE

SIR,—In your issue of Nov. 9 Prof. J. A. Ryle trails his coat on the vexed question of the ætiology of coronary disease which Sir Maurice Cassidy raised in his recent Harveian oration. I am prompted to ask the Irishman's question: Is this a private (physicians') fight, or can anyone (even a surgeon) join in?

From my hilltop position of seniority the fence between medicine and surgery appears merely as an artificial aid to the cultivation of a continuous field. This letter is primarily an assertion of the right of any one branch of medicine to offer criticism and suggestion to any other branch. In the present era of multiple specialism the maintenance of this right is of vital importance to the future of medicine. It offers a guarantee against the danger that the corpus of medicine will be split up into a number of specialties having no more organic connexion or communication between themselves than the joints on a butcher's counter: there will result an extravagant devotion to technique, and a loss of interest in pathology, which necessarily deals with the body as a working whole.

I must pursue this long digression a little further to make my meaning clear, and to illustrate the fruitful interchange of ideas. Many years ago the late Dr. Essex Wynter asked me to see with him a case of ascites, and suggested that I should expose the femoral canal, open it, and drain the fluid into the subcutaneous tissue of the thigh. In carefully selected cases Essex Wynter's operation of "femoral drainage" has proved to be a permanent cure for ascites. Per contra, I have ventured into the field of dermatology to prove that lupus is essentially a tuberculous lymphangitis, and into that of urology to suggest that for unilateral prostatic enlargement a unilateral adenectomy will give permanent relief at a minimum of risk. These are just instances of what I mean.

To return to coronary disease and its increasing frequency. I have recently come across two cases in medical men where a long history of chronic cholecystitis preceded cardiac trouble, and I would ask whether a chronic bacterial infection of the liver, probably staphylococcal, since that organism is *par excellence* the organism of thrombosis, is not a more likely cause than the "strain of modern life." Professor Ryle and Sir M. Cassidy in their country journeys are certainly subject to less strain than was Sir Astley Cooper in his stage-coach, shouting to the postilion "I pay sixpence a mile for bad driving, ninepence a mile for good driving, and a shilling a mile if you drive like hell."

It must be significant that the classes who subject their cardiovascular mechanism to maximum strain by heavy work are not the selected victims of coronary trouble. Mental work may fray the nerves, but does it impose much strain on the heart and arteries? What it certainly may do by interference with regular meals, digestion, sleep, and exercise, is to upset the alimentary mechanism, and favour chronic infections, helped as age advances by a growing defect of thyroid activity.

An attack on the subject from this point of view, and by really intensive pathological and bacteriological examination of even a few cases post mortem, might, I venture to think, prove even more rewarding than the extensive statistical inquiries suggested by Professor Ryle.

London, W.1. W. SAMPSON HANDLEY.

ICTERUS GRAVIS NEONATORUM

SIR,—In his interesting paper of Nov. 2 Dr. Third makes certain statements which are open to criticism. For instance, he says, "There seem to be, however, three very distinct pathological types"—hydrops fœtalis, toxic jaundice, and erythroblastæmia—and adds, "It is undesirable to include all groups under either icterus gravis or hæmolytic disease, because not all cases are hæmolytic, nor are all cases severely jaundiced." From the description he gives, "erythroblastæmia" is clearly the condition usually known as hæmolytic anæmia of the newborn, and, apart from the fact that babies suffering from icterus gravis are always severely jaundiced (otherwise why is the disease called icterus gravis?), children in all these three groups, although not necessarily obviously anæmic, do show evidence of hæmolysis and at autopsy an erythroblastotic reaction thereto.[1] Erythroblastæmia is the result of this reaction and is in no sense evidence of a special variety of hæmolytic disease of the newborn; indeed, it is sometimes absent in that disease at birth, whereas it is sometimes present in the normal full-term infant, and both it and jaundice may be present in sepsis neonatorum and congenital syphilis. The best general name for the disease under discussion is either "hæmolytic disease of the newborn" or "congenital hæmolytic disease," since the more usual title "erythroblastosis fœtalis" refers only to the erythroblastotic reaction which at one time American workers thought was the cause of the disease. The names given to the

---

[1] Parsons, L. G., Hawksley, J. C., Gittins, R. J. *Arch. Dis. Childh.* 1933, 8, 159.

In England Now

A Running Commentary by Peripatetic Correspondents

Now is my time for stocktaking. Until a year ago my life was in the R.A.F., now it's in G.P. The differences are very great and the changing mind can play queer tricks. For instance, there is one hilly road leading into our valley town that I will drive down in preference to all the others. This gives a panoramic view of the town below, turns sharp right and immediately increases its angle of descent for 100 yards (A.S.I. 90–95 m.p.h.). Then it flattens suddenly for 10 yards (1st check), descends again almost to the valley bottom, eases left, then right, bumps over a railway bridge (throttle back and ease the stick forward), then over a canal bridge (throttle right back, ease the tail down), and glides straight in towards the main street (flap lever up, look behind you). Then, instead of setting the trimmer tail heavy, I change into second gear and turn into the main street. My first solo is over, but it will never be forgotten.

There were awkward moments when a modern youth would slouch into the surgery and say, "I wornt a milk ticket furr me Dad." He would look at me as if I were the Minister of Labour. And I would look at him for long enough to curdle the milk before it was delivered.

Other difficulties were over forgetting the patients' names. It's easy to connect the face with the complaint, but even the pioneer studies of Ebbinghaus didn't help, because if one was going to use the method of learning by groups and related series whole families would have to attend the surgery together. But within a week of our finding a permanent house near the centre of the town I could remember most of the names and even recall the names of those I had seen in the first month. Retroactive inhibition? Emotional blockage? I dunno.

* * *

To sit in the common-room of any strange university and discuss the current technical problems is always a pleasure. To do so in Germany brings to life the shadowy curtain of unreality that seems inseparable from everything to do with the country just now.

We had sat through a demonstration of the effects of starvation on children, put on for our special benefit. There was only one case of any importance. All comment about prognosis, and the difficulty of getting rid of famine œdema, was immediately scotched by a reference to our experiences at concentration camps.

We then learnt, with joy (and it must be admitted a good deal of disbelief), that a way had been found of converting soya bean into an almost tasteless milk. It has been converted into almost everything in its time, but never has the scientist succeeded in disguising its taste for long. It has even been detected in the non-soya sausage now issued in lieu of its more famous relative, the war-time link. We were not then surprised to find that, though palatable at first, second thoughts were unanimous in deciding that nature's milk was better. Still, it is a useful adjunct to protein-starved Europe.

It might be thought that these little interludes would prevent a friendly discussion of Germany's educational and spiritual problems. We were delighted to find that the eminent professors (now often youngsters since their elders, and usually betters, had failed to survive either Hitler's or our purge) were only too glad to talk. They were afraid of Communism because once again it removed the responsibility of thinking from the individual. That, they thought, was its main appeal to the youth of the country, and not its economic policy. They told us the story of the school-teacher who, after a lecture on Independent Thought delivered by an eminent British Parliamentarian, went up to the speaker and asked for some guidance on independent thinking. They then fell into the same mistake themselves by saying that we should show them how to govern. When we suggested that they should try to find out and that we would try to guide them, they were a little surprised.

It is pathetic how lost the whole nation appears to be. It is also a little frightening to realise how difficult it is to bring into being an entirely new method of thought. The danger is that someone will give them a new doctrine to follow before they have assimilated the new method of reasoning that we are attempting to instil into their politics. Most of the Germans at heart still believe that their cause was right, but that they were unlucky in not applying a better method.

Rather unexpectedly there is a great demand among German students for instruction in philosophy. And yet perhaps not so strange. The Dean had some misgivings about this, fearing that it was not a real thirst for knowledge but a method of escape, and perhaps of self-justification. He did not find a willingness to learn from the older men, a desire to draw from their experience. But perhaps the German student is no different in that from his colleagues all over the world. "Everyone wants to be a student," he said. "There are far too many of them. What Germany wants for the next twenty years is men that can use their hands." Looking at the almost untouched piles of rubble we were inclined to agree.

* * *

I am going to start a one-man war against our chi occupational disease, though I cannot look forward any Nobel award if I succeed. My only recompense w be in the fact that the medical profession are the chi sufferers. Slowly but surely this detestable complai jargon aphasia, eporrhœa, or Herbert's disease, h been invading our ranks from the chief endemic reservo of infection—the official circular. Typical cases, li the "disinfestation officer" who circulated a repo which suggested that mice should be trapped as the emerge from their apertures, are fortunately rare, b there is no lack of this kind of thing:

> "This failure to exercise objective acumen derives fro professional indoctrination with the time-worn diagnost axiom, that to seek a plurality of causes for a clinical pictu is deplorable. It is understandable that in a busy clini scientific curiosity may be curbed when the therapeut exigencies are abbreviated by the self-determined cour of the disorder. . . . The phenomenology observed followin ingestion of *Datura stramonium* seeds may be incorrectl interpreted as evidence of an affective disorder."
>
> "Pronation deficiency following immobilisation in plast can be minimised by taking care to avoid inversion of th foot, and to see that the foot is pronated in plaster as muc as possible."
>
> "The drug is devoid of risk, but irresponsible patient should preferably be institutionalised."

In the general presence of disease we may forget th look of health. "Sir, your son was struck in the leg b a cannonball, that we were forced to cut it off, whereo he died. . . ." ". . . that you be hanged by the neck unti you are dead, and the Lord have mercy on your soul.' Deformed as we are, of necessity, by the weight o sulphonamides, heteroauxins, heteronymous hemianopias and osteodystrophiæ epiphysio-arthriticæ, we can at leas raise our heads to look back at better days.

In the matter of words and units, the electricians, wh made themselves a vocabulary to measure, have the better of us. Their terminology, crisp, homely, and readily transferable into an alphabet of signs that recall gardening implements, is enviable to us—better than the rings and semi-detached indoxyl penthouses of the biochemists with their barbarous names. Could we not measure olfactory thresholds in snouts and megasnouts, the lateness of honorary physicians at rounds in dawdles or coffees? A terminology rugged but not barbarous, that is what we want. Let us take personal names if we wish, and to ohms and curies let us oppose chaplins of valgus deformity, potts of curvature, even megafreddies of azoospermia and charringtons of polyuria. We could well enrich the language which we are now occupied to outrage.

* * *

"Even my driver sometimes doesn't know what the diagnosis is." This startling remark by an UNRRA medical officer in Germany led to the explanation that his colleagues from among the Displaced Persons of Eastern Europe very naturally and rightly report their diagnoses in Latin, of which tongue he, being Western-trained, was comparatively ignorant. His Polish D.P. driver, an ex-medical student, had recently explained to him, for example, that "Intussusceptio ustii abdominalis" did not mean that D.P.'s had a bone in their bellies unknown in America!

of the last treatment. Then there followed a course of psychotherapy lasting over two years which terminated when I was called up for service with H.M. Forces. I have since been demobbed with my group and returned to my civilian job and there has been no relapse.

I do not pretend that E.C.T. is a pleasant experience; I was anxious about it, but " dread " would be the wrong word to use, and I would have it again if necessary. Apart from the pain in the back following the convulsions the experience was not too bad. One is knocked out immediately. But it must be pointed out that even psychotherapy is not altogether an enjoyable experience. After many stormy sessions one learns that, unlike E.C.T., *there is no anæsthesia !*

It seems a pity to exaggerate about E.C.T. Surely by now a sufficient number of cases have been examined, treated, and followed up by competent psychiatrists for its true worth to be assessed ? DOCTOR-PATIENT.

SIR,—Dr. Learoyd (Nov. 23) disapproves of convulsion therapy, and speaks of our mental hospitals as of Belsens within our gates. He is, of course, entitled to his views; yet, To offend, and judge, are distinct offices, And of opposed natures.

Truro. H. PULLAR-STRECKER.

EXERCISE AND CARDIAC HYPERTROPHY

SIR,—Sir Adolphe Abrahams's case of cardiac hypertrophy (Oct. 19, p. 565) in an otherwise normal man of 78, who was in his youth a successful long-distance cyclist, is of extraordinary interest. The old-established opinion of some clinicians that a normal heart never hypertrophies, now queried in this paper, is overdue for revision.

There is considerable evidence that such hearts are acquired and not congenital. Whole series of oarsmen and long-distance runners show, as I have been able to demonstrate,[1] hypertrophy which can be recognised in the X-ray picture at a glance. It would appear very unlikely that these men have become record-holders through having large hearts.

The main evidence is that the hearts of professional sportsmen show, in the rare cases that come to necropsy, typical hypertrophy, affecting only those parts of the heart which are heavily strained.[2] Apart from this, there is plenty of evidence from training experiments with rats and dogs that certain kinds of exercise cause hypertrophy. It should not be necessary, therefore, to preserve the myth that the normal heart does not hypertrophy. It definitely does, and the importance of the case published is that the hypertrophy persisted into old age—a possibility which, till now, has been doubted by many, including myself.

London, N.22. H. HERXHEIMER.

ARSENICAL ENCEPHALOPATHY

SIR,—Dr. J. R. Edge reports (Nov. 9) an interesting case of myocardial fibrosis ending in fatal heart-failure, in a man who had been treated with neoarsphenamine for early syphilis. After the second injection of his second course of treatment the patient passed into coma, and on recovering was left with permanent bilateral pyramidal signs.

The cardiac complication is unusual, and I would suggest that the encephalopathy is worthy of further comment. Arsenical encephalopathy in Europeans is a very rare condition of which I have only seen one example. During the late war it was however very common amongst Indian troops. In two large V.D. centres in India the incidence of encephalopathy over a long period was as high as 1 in 73 cases treated, and in another over several months the incidence rose to 1 in 55. This became a very serious matter as the mortality was invariably about 50 %.

The factors underlying arsenical encephalopathy are by no means clear. Dosage is only one factor, and I have seen a fatal outcome following a single injection of 0·3 g. N.A.B. Probably a more important factor is the relationship of dose to body-weight, and most cases of encephalopathy in Indians occurred in the undernourished: incidentally, they were almost invariably Tamils or Bengalis.

The clinical picture is essentially one of coma and convulsions, often of very rapid onset, but sometimes preceded for a few hours by confusion or other altered mental states. Focal signs are usually absent, and, apart from dilated and sluggish pupils with bilateral extensor responses when coma was deep, I was never able to elicit focal signs. Various forms of empirical therapy were tried (British anti-lewisite was not available), but none seemed to influence the course of the disease in any way. Among the 50 % who recovered, I did not observe any sequelæ. Dr. Edge's case is therefore unusual in that there were apparently no convulsions and neurological sequelæ were severe.

Dr. Edge refers to the commonest findings in the brains of fatal cases. Major L. Krainer, R.A.M.C., found however that in a large number of cases careful microscopy did not show any adequate cause of death, and certainly in those cases which were rapidly fatal histological examination was negative.

Leeds. HUGH GARLAND.

MALT EXTRACT IN INFANT FEEDING

SIR,—An investigation at the Lister Institute[1] has shown that a combination of malt extract, wheat flour, and soya flour, in which about 70 % of the total solids and about 30 % of the total protein is obtained from malt extract, possesses a mixture of proteins whose growth-promoting value for young rats is about equal to that of the protein of milk. It is also concluded that such a mixture, if used for baby food, would not need supplementation with food yeast or synthetic B vitamins.

Since these important findings may find direct application in the present food crises, it seems desirable to emphasise that malt extract can vary widely in composition, as shown by the following data obtained in these laboratories on a series of some 70 commercial malt extracts from over 30 different manufacturers, excluding samples fortified with synthetic B vitamins[2]:

		per 100 g. dry matter	
		range	*mean*
" Protein "	g.	1·30–8·37	5·31
Vitamin B_1	mg.	0·23–0·58	0·37
Riboflavin	mg.	0·27–0·50	0·42
Nicotinic acid	mg.	9·3–16·5	12·6

The so-called " protein " of malt extract (vide *B.P.* 1932), being obtained by the action of malt enzymes on the crude protein of germinated barley, contains digestion products of protein which are more readily available to the actively growing baby or young rat. This should be borne in mind when seeking an explanation for the marked improvement in the biological value of the protein mixture in 'Maltavena' produced by the relatively small proportion (perhaps about a third) which can come from malt extract. Moreover, the growth-promoting properties of maltavena will also depend on its content of B vitamins, by far the greater part of which should be derived from the malt extract. The malt extracts we used in manufacturing the maltavena supplied to Dr. Chick for her experiments had vitamin-B contents close to the maxima in the above table, and protein contents well above the average. We can imagine that if maltavena were made with less nutritious malt extracts it might not give such good results. It is therefore desirable that the manufacture of maltavena for infant feeding should, wherever possible, be controlled by estimation of the above factors.

We emphasised this point strongly when discussing the matter last year with Major McNeile, who was then in charge of brewing and distilling in the British zone in Germany; and we offered to undertake estimations on maltavena preparations which he was arranging to make in Germany. We have not had the opportunity of examining any of the maltavena preparations which have been used in Germany, mainly in the Dortmund area, and we sincerely hope that their contents of the above factors have been controlled by other workers, and that such control will be exerted in any future experiments.

Ovaltine Research Laboratories,
King's Langley, Herts.

FRANK WOKES
Director of Research.

---

1. Grundriss der Sportmedizin, Leipzig, 1933.
2. Kirch, E. *Verh. dtsch. Ges. inn. Med.* 1935, 47, 73.

1. Chick, H., Slack, E. B. *Lancet*, Oct. 26, p. 601.
2. See Klatzkin, C., Norris, F. W., Wokes, F. *Quart. J. Pharm.* 1946, 19, 376.

three subgroups are derived from the outstanding symptoms present in each group—œdema in hydrops; jaundice in icterus gravis; hæmolytic anæmia in hæmolytic anæmia of the newborn.

Again, Dr. Third states that the results of blood-transfusions "are satisfactory in true erythroblastæmia only. In the 'toxic jaundice' type there is grave risk that if the child recovers it will be faulty to the point of imbecility." If, in fact, this were the case it would be wise to withhold blood-transfusion and allow these babies to die. In a series of over 250 babies suffering from hæmolytic disease of the newborn treated at the Children's Hospital, Birmingham, the majority of whom had icterus gravis, kernicterus—as evidenced by autopsy findings or by clinical symptoms such as extrapyramidal rigidity, mental deficiency, &c.—occurred in about 7% of cases; moreover, the incidence of kernicterus was not decreased by the use of Rh-negative blood. Dr. Third mentions that he has been able to find evidence of "cerebral or extrapyramidal irritation" in the majority of babies with "toxic jaundice" which came under his care. I have, however, never been able to find convincing signs of this condition in newborn babies, although on rare occasions a high-pitched cry and convulsions have suggested that possibility to me. If I ever did find unequivocal signs of kernicterus in a newborn baby I should certainly abstain from any form of treatment and wish for its death.

Finally, it is true, as Dr. Third points out, that Rh antibodies have been found in breast milk, but the evidence that these have any ill effect on the child is, so far, insufficient to warrant artificial feeding in preference to breast-feeding, although it may be wise to express the breast milk and boil it before giving it to the child.

Birmingham. LEONARD G. PARSONS.

CALCIFEROL FOR TUBERCULOUS ADENITIS

SIR,—Recently there have been in THE LANCET a few reports on the treatment of tuberculous cervical adenitis with high doses of calciferol, with apparently satisfactory results. In the last 6 months my partner and I have treated five children with this condition. The first three were treated by rest and good food. In two of these the glands became fluctuant and were repeatedly aspirated, eventually breaking down; and in the third they slowly resolved and healed in about $3^1/_2$ months.

The last two children, a girl of 11 years and a boy of 3 years, had in addition to general treatment 100,000 units of calciferol daily for a month. There was no obvious change in the first week, and then they rapidly began to resolve—the temperature came down, the periadenitis subsided, and the glands lost their tenderness and rapidly became more discrete, firmer, and smaller. The girl's gland had healed in 4 weeks and the boy's in 6 weeks. The boy's mass had been very large and under other conditions one would have expected it to become fluctuant. These results seemed very satisfactory, and there were no side-effects of the treatment. Both children had a well-marked positive Mantoux test to 1/1000 old tuberculin.

In view of the satisfactory reports on a few scattered cases it would be interesting to know if anyone has treated a wider group, and more scientifically.

Rothbury, Northumberland. ANTHONY BELL.

LEFT TURN

SIR,—In his speech on the Act (*Brit. med. J.* Nov. 16, p. 747) Dr. Dain describes as dictatorship the position where the representatives of the people have the chief say in deciding the principles on which the new service shall operate. In its place he appears to advocate "government of the doctors, by the doctors, for the doctors" as the essence of democracy.

This curiously inverted attitude, reminiscent of Father William, is shared by quite a number of the older members of the profession and arises from refusal to accept the fact that there has been something of a change in the political complexion of the country. Doctors were formerly entitled to a specially privileged status as protégés of the ruling class, and many of them are unwilling to accept the loss of privilege which this change implies. Is it too much to ask the profession to stand on their feet instead of their heads? The profession should be content to be assessed by the public at its true worth by the contribution which it can make to society. It should seek an alliance with a rising working-class rather than with a decaying bourgeoisie.

Insistence on professional "dignity" is merely an effort to retain the benefits of patronage which obtained under squirearchy. This is the obstacle which has prevented the medical profession from following the example of the teachers and other workers and organising itself in a trade union. Such a step is the proper remedy for the situation, visualised by the British Medical Association spokesmen, of doctors under the new Act with no right of appeal to an independent body. By this means the medical profession could at once secure a proper recognition of its own services and make a useful contribution to democracy in practice.

St. Mary Cray, Kent. BRIAN H. KIRMAN.

LOCAL PENICILLIN IN CORTICAL MASTOIDECTOMY

SIR,—Mr. Philip Reading (*Lancet*, 1946, i, 811) has described a method in which a cortical mastoidectomy cavity is filled with penicillin dissolved in fluid plasma, which is then clotted by adding thrombin; the skin incision is afterwards sutured completely.

This method is a great advance in the technique of completion and aftercare of this operation. We have found, however, that obtainable fluid plasma does not always coagulate on adding thrombin. If citrated blood taken from the patient by venepuncture be used *instead of plasma, its clotting may lead to a bogg* swelling, due to serum, under the wound, and cau *suspicion of pus. Insufflating the operation cavity* wi penicillin powder and letting it fill with blood al has the disadvantage of not ensuring homogeneo distribution of the penicillin throughout the clot.

We have obtained results as satisfactory as those Reading by filling the operation cavity with a pas made by mixing penicillin solution with plasma serum powder, using approximately 100,000 units penicillin in each instance. A thorough operation an very good hæmostasis are essential to success. Complet primary suture of the skin wound is carried out. I cases suitable for cortical mastoidectomy middle-ea suppuration has usually ceased and the tympanic men brane and the wound heal within a week. Audiomet tests before and some weeks after operation show tha the hearing of patients thus treated is usually improve or unaffected by the procedure; this applies also t other methods of aftercare of cortical mastoidectomy.

Warwick. J. A. HARPMAN.

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—Dr. Glaister (Oct. 26, p. 615) claims tha intensive electro-convulsive treatment is ethically wron when applied to psychoneurotics but ethically righ when applied to sufferers from melancholia. Yet in bot types the fundamental personalities are intact, so wha is the ethical difference in treating both by electro convulsions?

The rigid distinction between the symptoms and th disease made by Dr. Glaister is hard to draw in psycho logical medicine. Is melancholia a symptom or a disease Are the whining, the egocentricity, and the misery o the psychoneurotic merely symptoms? If such a patient is made cheerful, coöperative, and happy, and remains so, is not this a cure of his disease, no matter how th cure is effected?

Even if there be a slight intellectual deterioration after treatment, the patient is still the gainer if he be made happy. Presumably happiness is what the patient wants.

Bridlington. P. D. H. CHAPMAN.

SIR,—When your correspondents begin to mention Belsen and livid pages in history, it is surely time for doctor-patients who are not psychiatrists to give their experiences. In 1941 I suffered from a psychosis characterised by depression and anxiety. After wandering about the grounds of a mental home for many weeks, having given up hope of following my profession again, and with no confidence in medical colleagues, I received 10 convulsions, and returned to full dut

All the new and expanded social service schemes must be considered as a coördinated whole and most of the difficulties which have arisen out of the piecemeal introduction of parts of the schemes will be removed when the full schemes are in operation. In the meantime, the Assistance Board have been considering the position of children in families drawing supplementary pensions or unemployment assistance. They have now submitted draft regulations embodying increases in their scale rates for children which have been accepted by the Government, and I propose to lay these draft regulations before Parliament this week.

Tuberculosis Allowances

Lieutenant-Commander Clark Hutchison asked the Secretary of State for Scotland whether it was his intention to introduce amending legislation so as to enable a person who was in receipt of a tuberculosis allowance to draw, if otherwise eligible, the allowance payable under the Family Allowances Act, 1945.—Mr. G. Buchanan replied: Recent social legislation has aimed at the principle of avoiding duplication of benefits payable out of public funds, but Mr. Westwood is in consultation with the Minister of Health about the possibility of increasing the rate for children under the tuberculosis allowances scheme.

Miners' Dermatitis

Replying to a question Mr. James Griffiths stated that the number of cases of dermatitis among miners generally, the majority of whom will have been coalminers, from 1938 to 1945 were as follows:

1938	254	1942	884
1939	305	1943	1207
1940	402	1944	1506
1941	573	1945	1867

National Health Service

Mr. Somerville Hastings asked the Minister of Health whether, in view of the public misrepresentations regarding the National Health Service Act, he would consider the issue to the public of a short factual statement setting out the main provisions of the Act.—Mr. A. Bevan replied: At the appropriate time before the service comes into operation I intend to make known as widely as possible the effect of the Act and the nature of the services to be provided under it.

Health Insurance Prescriptions

Dr. R. Clitherow asked the Minister if he was aware that prescriptions for dangerous drugs and scheduled drugs were being issued to National Health Insurance patients in quantities sufficient, in many cases, to ensure a constant supply for many weeks—namely, 200 barbitone tablets in one case; and if, in view of the possibility of the patient taking increasing doses and perhaps becoming an addict, he would take steps to prevent the issue of National Health Insurance prescriptions containing dangerous drugs and scheduled drugs for more than one week's supply at any one time.—Mr. Bevan replied: I do not think it would be proper to interfere with a doctor's discretion by any such general prohibition.

National Dietary Survey

Mr. P. Piratin asked the Minister of Food whether he would institute a national dietary survey to determine what changes in food consumption were needed to provide the whole population with a diet fully adequate for proper health.—Mr. J. Strachey replied: Since the beginning of the Second World War the Ministry of Food have conducted a national food survey of the diets of working-class households. They also make use of the surveys, clinical and otherwise, made by the Ministry of Health, the Department of Health for Scotland, and by research centres throughout the country. In the light of this information the Ministry of Food has followed a policy of providing, to the limit to which supplies are available, a diet adequate for proper health for the different sections of the community. In this they have been guided by the advice of the Ministry of Health and their own scientific adviser. In the circumstances no additional dietary survey is necessary.

Hospital Accommodation for Mental Defectives

Mr. R. W. Sorensen asked the Minister of Health what increase had been secured in accommodation for mental defectives during the past twelve months; to what extent mental hospitals were becoming overcrowded; and to what extent the number of nurses, trained and training, respectively had increased during the past twelve months.—Mr. Bevan replied: During the past twelve months the accommodation for mental defectives has increased by 177 beds; on Jan. 1, 1946, mental hospitals were overcrowded to the extent of 13,176 patients, or 11·5% of the total accommodation; the number of nursing staff employed in mental hospitals and mental-deficiency institutions has increased by 620 during the twelve months ended June 30, 1946, bringing the total to 25,840, just over half of whom are fully trained.

Obituary

CHARLES WILLIAM DEAN

F.R.C.S.E.

Mr. C. W. Dean, consulting surgeon and ophthalmic surgeon to the Royal Lancaster Infirmary, died on Nov. 15, only a few days after his 86th birthday.

Born in Lancaster, he spent his whole life there, apart from his student years in Edinburgh and at St. Bartholomew's Hospital in London. After qualifying L.R.C.P.E. in 1884 he was for the most part engaged in general practice, but he found time and opportunity to train himself in general and ophthalmic surgery. In 1899 he took the Edinburgh fellowship, and his work won the esteem and confidence of his neighbouring colleagues. He was the first surgeon in Lancaster to remove an appendix, and that was over fifty years ago.

"Dean never took part in public life," writes J. A. G., "but he was keenly interested in music, and in younger days he was no mean performer on the French horn. His taste in literature was wide. Belles-lettres, biography, and travel were probably most to his taste, and he had a more than superficial knowledge of heraldry. With a retentive memory, which time had not impaired, he had as he himself used to say 'a mind stored with useless and irrelevant facts,' which was perhaps one of the chief charms of his conversation. Quiet and reserved in manner, somewhat impulsive, very sympathetic, the feature of his character which most impressed me was his intense and essential humanness."

JAMES LAW BROWNLIE

M.D. GLASG.

Dr. J. L. Brownlie, who died in Edinburgh on Nov. 12, was a former chief medical officer of the Department of Health for Scotland, but probably his happiest days as a doctor were spent in the laboratory.

In 1913 he graduated M.B. at the University of Glasgow, and three years later took the D.P.H. at Cambridge. In 1918 he was awarded his M.D. with commendation for a thesis on the problem of the diphtheria carrier. After serving for some years in Glasgow corporation fever hospitals he became assistant bacteriologist in the city laboratory, and there developed his flair for epidemiology. From the Glasgow laboratory Brownlie went to take charge of the Lanarkshire public-health laboratory, and in 1930 he joined the staff of the Department of Health for Scotland. At first he was concerned with hospital and laboratory services, but in 1932 he became chief medical officer in succession to the late Dr. Parlane Kinloch. He was reluctant to assume the post, for he did not greatly enjoy the political flavour and the rough and tumble of work in a Government office, and the four years during which he held senior office were years of indifferent health, which finally compelled him to resign. A fellow of the Royal Society of Edinburgh, his interests were catholic and variously filled the years of his retirement. His many friends will remember his human qualities, generous hospitality, and shrewd commentaries on official vicissitudes.

IZSET MEAD HAYTHORNTHWAITE

L.R.C.P.E.

Dr. I. M. Haythornthwaite, who died on Nov. 24 at King's Langley, was the second woman to receive the Scottish Conjoint qualification. Born in 1859 and trained by the Zenana Bible and Medical Mission, she took the L.R.C.P.E. in 1886. After postgraduate study in Vienna she became in 1887 house-surgeon under Elizabeth Garrett Anderson at the New Hospital for Women, which then stood where Marylebone Station now is.

DETECTION OF TUBERCLE BACILLI IN C.S.F.

SIR,—A technique of concentrating tubercle bacilli in cerebrospinal fluids which I have applied to 24 specimens has been found to give a greater number of positive results than the usual methods. The technique can also be used for exudates and transudates which are not too viscid: the morphology of organisms is not affected. The method is as follows:

1. Place 3 c.cm. of C.S.F. in a 15 ml. centrifuge tube.
2. Add about 7 c.cm. of absolute alcohol, and cork with a rubber stopper; shake by inverting for two minutes, and allow to stand for thirty minutes.
3. Centrifuge at high speed for at least five minutes, and pour off the supernatant fluid, leaving the residue.
4. Add 10 c.cm. of distilled water, shake for two minutes, centrifuge at high speed for five minutes, pour off the supernatant fluid, mix well the residue with a fine capillary pipette, spread fairly thick on a slide, and let it dry.
5. Stain with Ziehl-Neelsen's stain and examine.

Public Health Department, Amman, Trans-Jordan.

B. S. N. SHAMYEH
Assistant Bacteriologist.

PENICILLIN FOR GONORRHŒA IN THE FEMALE

SIR,—Dr. Mascall (Nov. 16, p. 712) has sounded a long-needed warning against the indiscriminate use of penicillin for "gonorrhœa" in women, and his emphasis on the part played by the gonococcus and (I would add) allied organisms in the production of a "great amount of the chronic ill health from which so many women suffer" is sound. Many of us, however, have found penicillin of more value in treatment than any previous drug that has been tried—provided that it is used only in the right way. So far, in civilian practice, the penicillin-resistant gonococcus is fortunately a rarity, though this may not continue. At present the main cause of failure in treating gonorrhœa in the adult female is the lack of clinical diagnosis of minor degrees of extension of the disease to the body of the uterus and the adnexa. This may occur directly after the first menstrual period following the infection. The majority of female patients do not seek advice until that time, possibly because a woman often believes that her vaginal symptoms will clear up after her period. This delay gives time for the infection to ascend to regions where it becomes less accessible to drugs such as systemic penicillin. It is found that cure is difficult unless drainage is established by dilatation of the cervix and a glycerin drain, followed within twenty-four hours by the administration of the usual dosage of penicillin (i.e., 25,000 to 50,000 units three-hourly for four doses). In our hands the single "massive" dose has not yielded such good results. To ensure success, some such procedure as drainage followed by penicillin is essential in most of the cases. Patients seen and diagnosed within the first week of infection form the only exception.

For the intelligent use of penicillin in gonorrhœa (and in certain allied infections) clinical experience in gynæcological diagnosis is essential, and this is nearly always lacking in medical officers who have received special training only for "130 hours at an approved centre." Failures in treatment will persist until it is customary, for example, in each department, for every patient to be examined pelvically by the chief at least once a month and preferably more often.

Dr. Mascall also mentions the difficulties in the treatment of vulvovaginitis in children and with this we all agree. These difficulties can however be greatly reduced by treating these children only as inpatients in a unit where the nursing staff have been specially trained. While at home the child is often reinfected by the original source (even if every care is taken in the "follow-up" of contacts), and the average mother cannot carry out the necessary procedures to diminish infection from the child's garments, &c. The child's general health plays a large part in the cure of this disease, and the provision of good food, regular hours, and fresh air is a most important factor.

Our grateful thanks are due to Dr. Mascall for emphasising the high rate of failure in the treatment of gonorrhœa in the female by "routine" methods. The public have recently been lulled into the mistaken belief that there is an "easy" treatment of a potentially serious condition.

London, W.1.

G. M. SANDES.

Parliament

FROM THE PRESS GALLERY

Education of the Deaf

ON Nov. 20, on the motion for adjournment, Mr. EDWARD EVANS drew the attention of the House to the needs of those born deaf, of the deafened, and the hard of hearing. Mr. Evans, who for many years was the headmaster of a school for the deaf, pointed out that deafness imposed a greater educational and social handicap on healthy people than any other disability. A child born deaf had to learn by a laborious and lengthy process not only how to speak but also how to acquire language. Even then he seldom attained the fluency of a normally hearing person. It was of the greatest importance that a deaf child should receive as early as possible the benefits of special education, but there was a tragic dearth of nursery accommodation and places for infants.

Nearly all deaf schools were understaffed, and Mr. Evans urged the Ministry of Education to encourage ex-Service men and women to take up this work. Only one secondary grammar school was available for deaf children, and it was incapable of dealing with the demand for places, was inadequately financed, and lacked representative control. There was also, Mr. Evans declared, a need for a first-class technical school where other trades than the traditional ones of bootmaking, tailoring, and baking could be taught. He was convinced that in normal schools many backward children suffered from some form of deafness, and with proper training would develop educationally. To pick out these children as early as possible, a gramophone audiometer, he suggested, should be in use in every school for group-testing. The certification of deaf people as mentally defective, he continued, was an anxiety to all who were associated with their welfare. Most psychological tests depended upon linguistic response beyond the capacity of the totally deaf, and he felt strongly that no deaf person should be certified unless a trained teacher of the deaf or a welfare worker was present.

In his reply Mr. C. KEY, parliamentary secretary to the Ministry of Health, said that there were a goodly number of schools for the deaf—some 44—already in existence, but there was a growing appreciation of the problem, and conferences were being held in many areas to consider the provision of additional schools and the extension of existing ones.

Because so much publicity had been given to the scheme to provide hearing-aids free of cost under the National Health Service it did not mean that the Government believed hearing-aids to be the beginning and the end of the problem. The electro-acoustics committee was only one of three M.R.C. committees. Another was at work on the medical and surgical considerations for the diagnosis and treatment of deafness, and another was considering the education of deaf children and adults. In framing comprehensive measures for the deaf the Minister would be armed with authoritative recommendations from all three, and Mr. Key thought there would be no difficulty in persuading the Medical Research Council to undertake further research.

QUESTION TIME

Streptomycin Trials

Colonel D. E. CROSTHWAITE-EYRE asked the Lord President of the Council what provision had been made by his department for research into the use of streptomycin, and whether any moneys had been allocated for research and production of this drug.—Mr. HERBERT MORRISON replied: The Medical Research Council have arranged for making controlled clinical trials of streptomycin, as soon as supplies are available, to determine its value in tuberculosis and other conditions and the best methods of its use. Funds are being allocated for the cost of this work, including the purchase of the necessary quantities of the product.

Family Allowances Complaints

Mr. P. DAINES asked the Minister of National Insurance whether he would now state what action it was proposed to take as a result of the examination of the complaints arising out of the working of the Family Allowances Act, to which his attention had been drawn.—Mr. JAMES GRIFFITHS replied:

All the new and expanded social service schemes must be considered as a coördinated whole and most of the difficulties which have arisen out of the piecemeal introduction of parts of the schemes will be removed when the full schemes are in operation. In the meantime, the Assistance Board have been considering the position of children in families drawing supplementary pensions or unemployment assistance. They have now submitted draft regulations embodying increases in their scale rates for children which have been accepted by the Government, and I propose to lay these draft regulations before Parliament this week.

Tuberculosis Allowances

Lieutenant-Commander CLARK HUTCHISON asked the Secretary of State for Scotland whether it was his intention to introduce amending legislation so as to enable a person who was in receipt of a tuberculosis allowance to draw, if otherwise eligible, the allowance payable under the Family Allowances Act, 1945.—Mr. G. BUCHANAN replied: Recent social legislation has aimed at the principle of avoiding duplication of benefits payable out of public funds, but Mr. Westwood is in consultation with the Minister of Health about the possibility of increasing the rate for children under the tuberculosis allowances scheme.

Miners' Dermatitis

Replying to a question Mr. JAMES GRIFFITHS stated that the number of cases of dermatitis among miners generally, the majority of whom will have been coalminers, from 1938 to 1945 were as follows:

1938	254	1942	884
1939	305	1943	1207
1940	402	1944	1506
1941	573	1945	1867

National Health Service

Mr. SOMERVILLE HASTINGS asked the Minister of Health whether, in view of the public misrepresentations regarding the National Health Service Act, he would consider the issue to the public of a short factual statement setting out the main provisions of the Act.—Mr. A. BEVAN replied: At the appropriate time before the service comes into operation I intend to make known as widely as possible the effect of the Act and the nature of the services to be provided under it.

Health Insurance Prescriptions

Dr. R. CLITHEROW asked the Minister if he was aware that prescriptions for dangerous drugs and scheduled drugs were being issued to National Health Insurance patients in quantities sufficient, in many cases, to ensure a constant supply for many weeks—namely, 200 barbitone tablets in one case; and if, in view of the possibility of the patient taking increasing doses and perhaps becoming an addict, he would take steps to prevent the issue of National Health Insurance prescriptions containing dangerous drugs and scheduled drugs for more than one week's supply at any one time.—Mr. BEVAN replied: I do not think it would be proper to interfere with a doctor's discretion by any such general prohibition.

National Dietary Survey

Mr. P. PIRATIN asked the Minister of Food whether he would institute a national dietary survey to determine what changes in food consumption were needed to provide the whole population with a diet fully adequate for proper health.—Mr. J. STRACHEY replied: Since the beginning of the Second World War the Ministry of Food have conducted a national food survey of the diets of working-class households. They also make use of the surveys, clinical and otherwise, made by the Ministry of Health, the Department of Health for Scotland, and by research centres throughout the country. In the light of this information the Ministry of Food has followed a policy of providing, to the limit to which supplies are available, a diet adequate for proper health for the different sections of the community. In this they have been guided by the advice of the Ministry of Health and their own scientific adviser. In the circumstances no additional dietary survey is necessary.

Hospital Accommodation for Mental Defectives

Mr. R. W. SORENSEN asked the Minister of Health what increase had been secured in accommodation for mental defectives during the past twelve months; to what extent mental hospitals were becoming overcrowded; and to what extent the number of nurses, trained and training, respectively had increased during the past twelve months.—Mr. BEVAN replied: During the past twelve months the accommodation for mental defectives has increased by 177 beds; on Jan. 1, 1946, mental hospitals were overcrowded to the extent of 13,176 patients, or 11·5% of the total accommodation; the number of nursing staff employed in mental hospitals and mental-deficiency institutions has increased by 620 during the twelve months ended June 30, 1946, bringing the total to 25,840, just over half of whom are fully trained.

Obituary

CHARLES WILLIAM DEAN

F.R.C.S.E.

Mr. C. W. Dean, consulting surgeon and ophthalmic surgeon to the Royal Lancaster Infirmary, died on Nov. 15, only a few days after his 86th birthday.

Born in Lancaster, he spent his whole life there, apart from his student years in Edinburgh and at St. Bartholomew's Hospital in London. After qualifying L.R.C.P.E. in 1884 he was for the most part engaged in general practice, but he found time and opportunity to train himself in general and ophthalmic surgery. In 1899 he took the Edinburgh fellowship, and his work won the esteem and confidence of his neighbouring colleagues. He was the first surgeon in Lancaster to remove an appendix, and that was over fifty years ago.

"Dean never took part in public life," writes J. A. G., "but he was keenly interested in music, and in younger days he was no mean performer on the French horn. His taste in literature was wide. Belles-lettres, biography, and travel were probably most to his taste, and he had a more than superficial knowledge of heraldry. With a retentive memory, which time had not impaired, he had as he himself used to say 'a mind stored with useless and irrelevant facts,' which was perhaps one of the chief charms of his conversation. Quiet and reserved in manner, somewhat impulsive, very sympathetic, the feature of his character which most impressed me was his intense and essential humanness."

JAMES LAW BROWNLIE

M.D. GLASG.

Dr. J. L. Brownlie, who died in Edinburgh on Nov. 12, was a former chief medical officer of the Department of Health for Scotland, but probably his happiest days as a doctor were spent in the laboratory.

In 1913 he graduated M.B. at the University of Glasgow, and three years later took the D.P.H. at Cambridge. In 1918 he was awarded his M.D. with commendation for a thesis on the problem of the diphtheria carrier. After serving for some years in Glasgow corporation fever hospitals he became assistant bacteriologist in the city laboratory, and there developed his flair for epidemiology. From the Glasgow laboratory Brownlie went to take charge of the Lanarkshire public-health laboratory, and in 1930 he joined the staff of the Department of Health for Scotland. At first he was concerned with hospital and laboratory services, but in 1932 he became chief medical officer in succession to the late Dr. Parlane Kinloch. He was reluctant to assume the post, for he did not greatly enjoy the political flavour and the rough and tumble of work in a Government office, and the four years during which he held senior office were years of indifferent health, which finally compelled him to resign. A fellow of the Royal Society of Edinburgh, his interests were catholic and variously filled the years of his retirement. His many friends will remember his human qualities, generous hospitality, and shrewd commentaries on official vicissitudes.

IZSET MEAD HAYTHORNTHWAITE

L.R.C.P.E.

Dr. I. M. Haythornthwaite, who died on Nov. 24 at King's Langley, was the second woman to receive the Scottish Conjoint qualification. Born in 1859 and trained by the Zenana Bible and Medical Mission, she took the L.R.C.P.E. in 1886. After postgraduate study in Vienna she became in 1887 house-surgeon under Elizabeth Garrett Anderson at the New Hospital for Women, which then stood where Marylebone Station now is.

For the next five years she worked in the Lady Kinnaird Hospital for Women and Children with Miss Haskew (now Mrs. Birket), to whose efforts the building of that hospital was largely due.

Her marriage in 1892 to the Rev. J. P. Haythornthwaite put a term to her regular medical work, but while in Agra, from 1893 to 1911, as wife of the principal of St. John's College she found ample opportunities in ministering to the families of missionaries as well as in bringing up her own five children. In 1915 her eldest son was killed in action in France, and though by now she was getting old and somewhat infirm, she did her best to fill a place in the depleted ranks of doctors serving the civilian population. For short periods she worked as clinical assistant at the Garrett Anderson Hospital, and as resident medical officer at the Nayland Sanatorium For three years she was also visiting physician of the Four Boroughs antenatal clinic, and first doctor to the King's Langley antenatal clinic.

Her husband died many years before her; but she leaves three children, two of them doctors in India, who mourn the loss of a woman of more than ordinary character, ability, and sweetness.

E. P. H.

Diary of the Week

DEC. 1 TO 7

Tuesday, 3rd

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1

5 P.M. Dr. H. L. Marriott: Quantitative Considerations Regarding *Depletion of Tissue Fluid and Blood Constituents.* (First Croonian lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

5.30 P.M. *Orthopædics.* Cases will be shown at 4.30 P.M.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2

5 P.M. Dr. G. B. Dowling: Erythrodermias.

Wednesday, 4th

ROYAL SOCIETY OF MEDICINE

2.30 P.M. *History of Medicine.* Dr. H. P. Bayon: Transition between Scholastic and Clinical Medicine in Europe during the 16th and 17th Centuries.

5 P.M. *Comparative Medicine.* Mr. H. H. Holman, PH.D.: Studies on the Hæmatology of the Horse, Ox, and Sheep. Mr. J. B. Brooksby: Serum Proteins of the Domestic Animals. Dr. C. L. Oakley: *Normal Constituents of Human Blood.* Dr. H. Grüneberg: *Inherited Disorders of the Blood in* Rodents.

8 P.M. *Surgery.* Pathological Meeting.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1

3.30 P.M. Prof. Arnold Sorsby: Blindness in Childhood—Past Achievements and Present Problems.

Thursday, 5th

ROYAL COLLEGE OF PHYSICIANS

5 P.M. Dr. H. L. Marriott: Quantitative Considerations Regarding Depletion of Tissue Fluid and Blood Constituents. (Second Croonian lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2

5 P.M. Dr. B. D. Pullinger: *Cystic Disease of the Breast*—Human and Experimental. (Imperial Cancer Research Fund lecture.)

MEDICAL SOCIETY OF THE L.C.C. SERVICE

3 P.M. (North Eastern Hospital, St. Ann's Road, South Tottenham.) Cases will be shown. Dr. E. H. R. Harries: Modern Fever Hospital.

LONDON SCHOOL OF DERMATOLOGY

5 P.M. Dr. L. Forman: Cutaneous Manifestations of Malignant Disease.

CHADWICK PUBLIC LECTURES

4.30 P.M. (St. Mary's Hospital medical school, Paddington, W.2.) Prof. C. H. Stuart-Harris: Problem of Prevention of Acute Diseases of the Respiratory Tract, with Particular Reference to Influenza.

Friday, 6th

ROYAL SOCIETY OF MEDICINE

10.30 A.M. *Otology.* Cases will be shown at 10 A.M. Mr. Terence Cawthorne: Review of Surgery of Otosclerosis. Mr. Garnett Passe: Fenestration Operation. (Coloured film.)

2.30 P.M. *Laryngology.* Cases will be shown at 2 P.M. Miss D. J. Collier: Epistaxis. Mr. R. G. Macbeth: Ligation of Anterior Ethmoid Artery for Epistaxis.

5.30 P.M. *Anæsthetics.* Prof. H. N. Green, Dr. R. P. Harbord: Shock, with Special Reference to Anæsthesia.

BIOCHEMICAL SOCIETY

1.30 P.M. (National Institute for Medical Research, Hampstead, N.W.3.) Papers.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION

8.30 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Dr. W. Ritchie Russell: Rehabilitation after Head Injuries.

LONDON CHEST HOSPITAL, Victoria Park, E.2

5 P.M. Dr. Browning Alexander: Diagnosis and Treatment of Lung Abscess.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh

8 P.M. Colonel L. W. Harrison: Half a Lifetime in V.D.—from Chaos to Order.

Notes and News

MEDICAL WAR RELIEF FUND

DURING the past year 81 awards have been made from this fund at a cost of £18,016. The total amount distributed since the inauguration of the fund is now £52,236. Most of the applicants have been ex-Service doctors whose single-handed practices have declined seriously in their absence; other applications include ten from widows of doctors who lost their lives in the war. It is expected that further calls on the fund will be made by demobilised doctors needing help in resettlement, and by widows seeking the means to educate young children. The contributions received since the second appeal in December, 1945, amount to about £22,000. The committee hopes that those who have not yet responded will subscribe; cheques, payable to the fund, should be sent to the hon. treasurer at B.M.A. House, Tavistock Square, London, W.C.1.

ATOMIC WAR

Prof. Albert Einstein and a group of scientists have appealed for £250,000 to be used in educating the community in the social implications of atomic energy and the steps necessary to avoid the destruction of civilisation. The *Manchester Guardian* (Nov. 18) reports that the appeal is accompanied by the following declaration:

1. Atomic bombs can now be made cheaply and in large number. They will become more destructive.
2. There is no military defence against the atomic bomb and none can be expected.
3. Other nations can rediscover American secret processes by themselves.
4. Preparedness against atomic warfare is futile and if attempted will ruin the structure of our social order.
5. If war breaks out atomic bombs will be used and they will surely destroy our civilisation.
6. There is no solution to this problem except the international control of atomic energy and ultimately the elimination of war.

L.C.C. AND BOARDING-SCHOOLS

AT a meeting on Nov. 20 the L.C.C. education committee decided that a boarding-school education should be provided for children in certain categories. From September, 1947 the county council expects to have just over 200 places in direct-grant and independent schools. Selection will be made from: (1) orphans or neglected children, (2) children whose parents are unable to look after them, (3) children of parents living abroad, (4) children whose homes are moved frequently from one part of the country to another, and (5) children who live in congested areas. The education subcommittee take the view that, with the present restricted accommodation any attempt to place other children in boarding-schools, as envisaged recently by the Minister of Education,[1] should be deferred until these special categories have been dealt with.

TIERRA DEL FUEGANS

Prof. Alejandro Lipschutz, at a meeting of the Roya Anthropological Institute on Nov. 12, described the results obtained by a recent expedition to Tierra del Fuego. One o its objects was to determine whether the natives belonged to the general stock of American Indians or were descended from Australian immigrants. A great obstacle to the solution of this question was the fact that not only had the population dwindled from about two or three thousand a century ago to about two hundred today, but also miscegenation with Europeans had taken place to such an extent that only about a tenth of the Indians claimed to be of pure blood, and even their claims were very suspect. The blood-groups were determined in 77 persons, belonging to three very different tribes, and group O was found in about three-quarters of them pointing to the derivation of these three stocks from the general body of American Indians generally recognised as Mongoloid immigrants from Asia.

CANCER CONTROL IN LIVERPOOL

THE "unincorporated association known as Liverpool Cancer Control Organization" came into being on Feb. 3, 1939; it was not until March 23, 1945, that it received a certificate of incorporation. Thus its first report covers the work of six years. The two constant aims have been the concentration of resources and the establishment of a regional organisation based on Liverpool. In 1939 the city had four different stocks of radium, apart from that held privately, and two hospitals independently were conducting radiotherapy; surgical treatment was being undertaken in a large number of hospitals, and various separate bodies were interested in cancer control. Despite war-time diversions substantial progress has been made. The organisation has suggested that the Radium Institute should be amalgamated with the United Hospital, and that all X-ray therapy should then be concentrated in the institute as a branch of the United Hospital; this would mean that, when eventually the new United Hospital is built, its Radium Institute branch would take a place on the common site. This policy is approved by the National Radium Commission, and the plan has been under discussion by the parties directly concerned. Though the Cancer Act of 1939 will be superseded when the National Health Service Act comes into operation, the organisation, whose purposes are wider than those of the Cancer Act, expects to continue "to assist in combating the onset, progress, and effect of cancer, and to alleviate the sufferings caused by cancer."

---

[1] Circular no. 120. See *Lancet*, August 31, p. [illegible]

SCIENTIFIC WHAT'S WHAT

In 1920 the Conjoint Board of Scientific Societies, acting on the suggestion of Sir Sidney Harmer, F.R.S., worked out a cheme for a complete list of scientific periodicals. When, in 923, the board was dissolved, the work was taken over by new non-profit company, under the chairmanship of the ate Sir Peter Chalmers Mitchell, F.R.S. With the help of donations from the Carnegie Trust and from private sources the first edition of the *World List of Scientific Periodicals* ppeared in 1925, and was followed by a second edition in 1934. This book, which names the place of publication and the ecommended abbreviation of over 33,000 periodicals and also gives the libraries where they are stocked, has proved nvaluable to scientists and librarians in and beyond Great Britain. For some time, however, it has been out of print, nd the council of management, under the chairmanship of Mr. S. A. Neave, D.SC., has decided to undertake a new edition, ncluding all periodicals published between 1900 and 1947. Librarians can help in the compilation of the list by sending particulars of journals either not included in the second dition or shown as having no location in this country. Communications should be directed to the secretary, World List of Scientific Periodicals, c/o the Zoological Society of London, Regent's Park, London, N.W.8.

BRITISH COUNCIL

THE council has had another active year. As might be xpected, European countries, such as Yugoslavia, are eager or news from Britain after their years of isolation; and there has been a heavy demand for medical books and periodicals.[1] The council has continued to publish its own medical journal, he *British Medical Bulletin*; it also runs a medical information service, helps to stock medical libraries, arranges for visits o Britain by foreign doctors and for overseas tours by British doctors, organises programmes for holders of the council's cholarships in medicine, and sponsors medical films. During he past years exhibitions of medical books have been held in arious countries, and Anglo-Chilean and Argentine-British medical centres have been opened. The council aims not only o interpret British ways to other countries but to promote our own understanding of foreign cultures; outside medicine his purpose was reflected in the exhibition here of paintings by Picasso and Matisse, and the interchange visits between he Old Vic company and the Comédie Française.

SENTENCE OF DEATH

FOR many years now the case for and against capital punishment has been debated in this country. In 1930 a select committee, in a majority report, recommended its uspension for an experimental period of five years; and the ssue will doubtless be raised again when the Government are able to introduce their Criminal Justice Bill. In the meanime, Mrs. Calvert has written a pamphlet in which the arguments for abolition are clearly set out.[1] Certainty of conviction and punishment, she says, is more effective in preventing crime than severity. When in 1810 Sir Samuel Romilly brought a proposal before Parliament to end capital punishment for shoplifting to the value of five shillings and upwards, Lord Ellenborough, the Chief Justice, said in the House of Lords' debate: "Such will be the consequence of the repeal of this statute that I am certain depredations to an unlimited extent would be immediately committed." The event proved him wrong. In eleven European countries, in parts of North and South America and Australia, and in New Zealand, the death penalty has been abolished or abrogated by disuse without influencing the trend of homicide figures. "It has," Mrs. Calvert concludes, "no place in a modern system of penal administration, and it is high time that it was swept away, and that the gallows took a place with the rack and the triangle in some limbo of obsolete instruments of punishment and torture."

University of Cambridge

At a congregation on Nov. 16 the following degrees were conferred:

M.B., B.Chir.—N. H. Harwood-Yarred, W. A. A. Hodges (by proxy); H. G. Mather.

University of London

Dr. John McMichael has been appointed to the university chair of medicine tenable at the British Postgraduate Medical School, as from Oct. 1, 1946.

Dr. McMichael is 42 years of age. He was educated at Kirkcudbright Academy and the University of Edinburgh, where in 1927 he was awarded the Eccles scholarship as the most distinguished graduate of the year. After holding house-appointments at the Royal Infirmary, Edinburgh, and at Paddington Green Children's Hospital, London, he returned to Edinburgh University in 1929 as Goodsir fellow to work in the departments of pathology and surgery. In 1930 he became M.R.C.P.E., and for the next four years he held a Beit fellowship, working first as assistant to the professor of medicine in the University of Aberdeen, and later as clinical assistant to Dr. J. W. McNee at University College Hospital, London, with whom he made a special study of the splenic anæmias. He was awarded a gold medal for his M.D. thesis in 1933. In 1934 he was appointed lecturer in human physiology in the University of Edinburgh, and in 1936 became Johnston and Lawrence research fellow of the Royal Society and extra hon. assistant physician at the Royal Infirmary, Edinburgh. He was elected F.R.S.E. in 1936 and F.R.C.P.E. in 1940. Since 1939 Dr. McMichael has been reader in medicine, and from the outbreak of the late war acting director of the department of medicine, at the British Postgraduate Medical School, London. Besides his work on the splenic anæmias, Dr. McMichael has published papers on hæmorrhage, shock, cardiac failure, and hepatitis.

Dr. S. D. Elliott has been appointed to the university readership in bacteriology tenable at the London Hospital medical college, as from Oct. 1, 1946.

From 1933 to 1935 Dr. Elliott was demonstrator in bacteriology, and from 1935 to 1937 assistant lecturer, at University College Hospital medical school. From 1937 to 1938 he was university demonstrator in pathology at Cambridge. Since 1938 he has been a Freedom research fellow in the department of bacteriology at the London Hospital medical college, from which he was seconded to the Emergency Medical Service during the war years. In February, 1941, he returned to the staff of the college, and was seconded to the Rockefeller Institute, New York, for six months.

University of Leeds

Mr. F. C. Happold, D.SC., reader in biochemistry, has been appointed to the chair of biochemistry, from August 1, 1946.

Mr. Digby Chamberlain has been appointed professor of surgery, from Oct. 1, 1946.

Mr. Chamberlain studied medicine at Leeds, where he qualified M.B., with first-class honours, in 1921. In 1924 he graduated CH.M., and became F.R.C.S. He was resident surgical officer and assistant surgeon at the General Infirmary before appointment to his present post as surgeon. He is also honorary visiting surgeon to a number of hospitals in and around Leeds. In 1921 he was awarded the William Hey gold medal by the University of Leeds, and in 1940 was Hunterian professor of the Royal College of Surgeons. He has taken special interest in abdominal surgery, on which he has published a number of papers.

The title of emeritus professor has been conferred on Prof. William MacAdam, Prof. P. L. Sutherland, and Prof. C. W. Vining.

University of Glasgow

Sir John Boyd Orr, M.D., F.R.S., has been elected chancellor of the university.

Royal College of Surgeons of England

The following lectures will be given at 5 P.M. during December: Thursday, 5th, Dr. B. D. Pullinger, Cystic Disease of the Breast, Human and Experimental (Imperial Cancer Research Fund lecture); Thursday, 12th, Mr. W. Rowley Bristow, Injuries of the Peripheral Nerves in Two World Wars (Robert Jones lecture); Tuesday, 17th, Mr. R. W. Raven, Melanoma and Related Tumours (Erasmus Wilson demonstration); and Thursday, 19th, Dr. E. Ashworth Underwood, Naval Medicine in the Ages of Elizabeth and John (Thomas Vicary lecture).

A course of 72 lectures on anatomy, applied physiology, and pathology will be given at the college between Feb. 3 and March 28, 1947, at 3.45 and 5 P.M. daily.

British Council, 3, Hanover Street, London, W.1. Annual report for 1945–46. Pp. 178.

Capital Punishment: Society Takes Revenge. By Theodora Calvert. Published by National News-Letter, 162, Buckingham Palace Road, London, S.W.1. 1s.

For the next five years she worked in the Lady Kinnaird Hospital for Women and Children with Miss Haskew (now Mrs. Birket), to whose efforts the building of that hospital was largely due.

Her marriage in 1892 to the Rev. J. P. Haythornthwaite put a term to her regular medical work, but while in Agra, from 1893 to 1911, as wife of the principal of St. John's College she found ample opportunities in ministering to the families of missionaries as well as in bringing up her own five children. In 1915 her eldest son was killed in action in France, and though by now she was getting old and somewhat infirm, she did her best to fill a place in the depleted ranks of doctors serving the civilian population. For short periods she worked as clinical assistant at the Garrett Anderson Hospital, and as resident medical officer at the Nayland Sanatorium For three years she was also visiting physician of the Four Boroughs antenatal clinic, and first doctor to the King's Langley antenatal clinic.

Her husband died many years before her; but she leaves three children, two of them doctors in India, who mourn the loss of a woman of more than ordinary character, ability, and sweetness.

E. P. H.

Diary of the Week

DEC. 1 TO 7

Tuesday, 3rd

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. H. L. Marriott: Quantitative Considerations Regarding Depletion of Tissue Fluid and Blood Constituents. (First Croonian lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Orthopædics.* Cases will be shown at 4.30 P.M.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. G. B. Dowling: Erythrodermias.

Wednesday, 4th

ROYAL SOCIETY OF MEDICINE
2.30 P.M. *History of Medicine.* Dr. H. P. Bayon: Transition between Scholastic and Clinical Medicine in Europe during the 16th and 17th Centuries.
5 P.M. *Comparative Medicine.* Mr. H. H. Holman, PH.D.: Studies on the Hæmatology of the Horse, Ox, and Sheep. Mr. J. B. Brooksby: Serum Proteins of the Domestic Animals. Dr. C. L. Oakley: Normal Constituents of Human Blood. Dr. H. Grüneberg: Inherited Disorders of the Blood in Rodents.
8 P.M. *Surgery.* Pathological Meeting.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Prof. Arnold Sorsby: Blindness in Childhood—Past Achievements and Present Problems.

Thursday, 5th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. H. L. Marriott: Quantitative Considerations Regarding Depletion of Tissue Fluid and Blood Constituents. (Second Croonian lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. B. D. Pullinger: Cystic Disease of the Breast—Human and Experimental. (Imperial Cancer Research Fund lecture.)

MEDICAL SOCIETY OF THE L.C.C. SERVICE
3 P.M. (North Eastern Hospital, St. Ann's Road, South Tottenham.) Cases will be shown. Dr. E. H. R. Harries: Modern Fever Hospital.

LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. L. Forman: Cutaneous Manifestations of Malignant Disease.

CHADWICK PUBLIC LECTURES
4.30 P.M. (St. Mary's Hospital medical school, Paddington, W.2.) Prof. C. H. Stuart-Harris: Problem of Prevention of Acute Diseases of the Respiratory Tract, with Particular Reference to Influenza.

Friday, 6th

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Cases will be shown at 10 A.M. Mr. Terence Cawthorne: Review of Surgery of Otosclerosis. Mr. Garnett Passe: Fenestration Operation. (Coloured film.)
2.30 P.M. *Laryngology.* Cases will be shown at 2 P.M. Miss D. J. Collier: Epistaxis. Mr. R. G. Macbeth: Ligation of Anterior Ethmoid Artery for Epistaxis.
5.30 P.M. *Anæsthetics.* Prof. H. N. Green, Dr. R. P. Harbord: Shock, with Special Reference to Anæsthesia.

BIOCHEMICAL SOCIETY
1.30 P.M. (National Institute for Medical Research, Hampstead, N.W.3.) Papers.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION
8.30 P.M. (B.M.A. House, Tavistock Square, W.C.1.) Dr. W. Ritchie Russell: Rehabilitation after Head Injuries.

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. Browning Alexander: Diagnosis and Treatment of Lung Abscess.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Colonel L. W. Harrison: Half a Lifetime in V.D.—from Chaos to Order.

Notes and News

MEDICAL WAR RELIEF FUND

DURING the past year 81 awards have been made from this fund at a cost of £18,016. The total amount distributed since the inauguration of the fund is now £52,236. Most of the applicants have been ex-Service doctors whose single-handed practices have declined seriously in their absence; other applications include ten from widows of doctors who lost their lives in the war. It is expected that further calls on the fund will be made by demobilised doctors needing help in resettlement, and by widows seeking the means to educate young children. The contributions received since the second appeal in December, 1945, amount to about £22,000. The committee hopes that those who have not yet responded will subscribe; cheques, payable to the fund, should be sent to the hon. treasurer at B.M.A. House, Tavistock Square, London, W.C.1.

ATOMIC WAR

Prof. Albert Einstein and a group of scientists have appealed for £250,000 to be used in educating the community in the social implications of atomic energy and the steps necessary to avoid the destruction of civilisation. The *Manchester Guardian* (Nov. 18) reports that the appeal is accompanied *by the following declaration:*

1. Atomic bombs can now be made cheaply and in large number. They will become more destructive.
2. There is no military defence against the atomic bomb and none can be expected.
3. Other nations can rediscover American secret processes by themselves.
4. Preparedness against atomic warfare is futile and if attempted will ruin the structure of our social order.
5. If war breaks out atomic bombs will be used and they will surely destroy our civilisation.
6. There is no solution to this problem except the international control of atomic energy and ultimately the elimination of war.

L.C.C. AND BOARDING-SCHOOLS

AT a meeting on Nov. 20 the L.C.C. education committee decided that a boarding-school education should be provided for children in certain categories. From September, 1947, the county council expects to have just over 200 places in direct-grant and independent schools. Selection will be made from: (1) orphans or neglected children, (2) children whose parents are unable to look after them, (3) children of parents living abroad, (4) children whose homes are moved frequently from one part of the country to another, and (5) children who live in congested areas. The education subcommittee take the view that, with the present restricted accommodation any attempt to place other children in boarding-schools, as envisaged recently by the Minister of *Education*,[1] should be deferred until these special categories have been dealt with.

TIERRA DEL FUEGANS

Prof. Alejandro Lipschutz, at a meeting of the Roya Anthropological Institute on Nov. 12, described the result obtained by a recent expedition to Tierra del Fuego. One o its objects was to determine whether the natives belonge to the general stock of American Indians or were descende from Australian immigrants. A great obstacle to the solutio of this question was the fact that not only had the populatio dwindled from about two or three thousand a century ago t about two hundred today, but also miscegenation wit Europeans had taken place to such an extent that only abou a tenth of the Indians claimed to be of pure blood, and eve their claims were very suspect. The blood-groups wer determined in 77 persons, belonging to three very differen tribes, and group O was found in about three-quarters of them pointing to the derivation of these three stocks from the genera body of American Indians generally recognised as Mongoloi immigrants from Asia.

CANCER CONTROL IN LIVERPOOL

THE "*unincorporated* association known as Liverpoo Cancer Control Organization" came into being on Feb. 3, 1939; it was not until March 23, 1945, that it received a certificate of incorporation. Thus its first report covers the work of six years. The two constant aims have been the concentration of resources and the establishment of a regional organisation based on Liverpool. In 1939 the city had four different stocks of radium, apart from that held privately, and two hospitals independently were conducting radiotherapy; surgical treatment was being undertaken in a large number of hospitals, and various separate bodies were inter-

---

[1] Circular no. 120. See *Lancet*, August 31, p. 323.

SYNOVIAL MEMBRANE AND SYNOVIAL FLUID OF JOINTS*

D. V. DAVIES
M.B. Lond.
LECTURER IN ANATOMY, UNIVERSITY OF CAMBRIDGE

LITTLE attention has been paid to the synovial membrane and synovial fluid of joints, although their mechanics have been discussed a great deal.

Paracelsus coined the term *synovia* or *synophia* for the fluid in joints (Hyrtl 1880). Among observations on the anatomy and physiology of joints are those of William Hunter (1743) on the blood-supply, the circulus vasculosus articuli; Bichat (1806) on the nature of the synovial membrane and the origin of the fluid; and John Hilton (1863) who enunciated what is now known as Hilton's law.

Recent contributions by Bauer and his colleagues (1930, 1940) have given accurate chemical analyses of both bovine and human synovial fluids. From the synovial mucin Meyer et al. (1939) have isolated its polysaccharide, which they term hyaluronic acid. Hoffman and Duran-Reynals (1930, 1931) and Chain and Duthie (1940) have isolated an enzyme, hyaluronidase, from animal and bacterial tissue capable of hydrolysing this mucin.

DEVELOPMENT

All the components of the diarthrodial joint are developed from mesoderm. The chondrifying skeletal elements, already sketched on the adult pattern, are at first separated by mesenchymal tissue, in which cavitation soon appears and delineates the joint cavity. The perichondrium is continued over the joint cavity as the capsule, while the lining of the cavity presents, on the one hand, articular cartilage and, on the other, synovial membrane. The capsule is composed of tough, inelastic, relatively avascular, white connective tissue with marked powers of resistance to disease and relatively low powers of repair. It differs but little from perichondrium or periosteum. The synovial membrane, on the other hand, is a soft, freely moving and elastic, sensitive membrane with a good blood-supply, good powers of repair and regeneration, and well-marked phagocytic powers. Accident, attrition, repeated trauma of the joint, and liability to certain infections (all forms of arthritis) focus attention on the vascularity and special function of the synovial membrane.

Special Features of the Diarthrodial Joint

STRUCTURE OF THE SYNOVIAL MEMBRANE

The synovial membrane forms a relatively smooth glistening yellowish or grey lining, covering all intra-articular surfaces except the cartilage-covered weight-bearing areas. It extends a few millimetres over the margin of the articular cartilage, adheres firmly to it, and terminates without any sharp line of demarcation. The contention of William Hunter (1743), upheld later by Bichat (1806), that it clothed the articular surfaces was rightly contradicted by Cruveilhier, Magendie, and Velpeau (Todd 1836).

The surface of the synovial membrane presents a variable number of folds and villi and, occasionally, delicate cord-like bridges, more often met with in bursæ. Information is still lacking about the extent of the synovial surface in various joints and its relation to the area of articular surface. Estimates of the synovial surface in the human knee- and ankle-joints show that, whereas the synovial membrane of the knee-joint is 43 sq. in., that of the ankle-joint is only 7 sq. in., but the cartilaginous surface of the ankle-joint is 5 sq. in. and that of the knee-joint only 23 sq. in.

The mobility and thickness of the synovial membrane depends on the quality and amount of the underlying subsynovial tissue and is adjusted to suit mechanical requirements. The underlying tissue may be abundant and loose in texture, the areolar type of Key (1928); dense collagenous tissue as at the articular margins or covering ligaments (fibrous type); or a pad of fat covered with a layer of synovial membrane in which the cells are more flattened (adipose type). Pads of fat are found in most joints and have in the past attracted much attention. Havers (1691) regarded them as mucilaginous glands. This view was rejected by Bichat (1806). MacConaill (1932) suggested that the freely movable pads of fat effected distribution of the synovial fluid. The extent and distribution of the areolar, fibrous, and adipose types of synovial membrane vary greatly from joint to joint; the temporomandibular joint, for example, is lined with a predominantly fibrous membrane, whereas the ankle-joint displays all three types, but predominantly the adipose and areolar.

The synovial membrane is relatively cellular, and its cells are pleomorphic, varying in their dimensions. There is little morphological similarity between the synovial membrane and the lining of serous cavities, such as the pleura and the peritoneum. The cells are often separated from the joint cavity by a homogeneous eosinophilic ground substance or even by collagenous fibres. The cells show a finely granular eosinophilic cytoplasm with occasional vacuoles or fat globules. Mitochondria are present as small granules or rods but display no constant orientation. The existence of a Golgi apparatus is denied by Key (1928) and Davies (1943) but described and figured by King (1935), who thinks that the orientation of the cell components is of functional significance.

Unlike pleura and peritoneum there is no basement membrane in the synovial membrane. Except at the transition zone of the articular margins, no cells resembling those of cartilage occur. Chondromatosis of the synovial membrane results from metaplasia and not from proliferation of pre-existing cartilage cells.

The statement that elastic tissue is sparse in synovial membrane is incorrect. A network of fine elastic fibres pervades most regions; this increases in amount in the more mobile areas and may form one or two distinct elastic laminæ (fig. 1). No elastic fibres occur in the villi except in association with the blood-vessels, and they are generally scanty over the fat pads. The elastic laminæ prevent the more mobile areas from being nipped between the articulating surfaces during motion.

NATURE OF SYNOVIAL CELLS

Much confusion exists as to the nature of the synovial lining. The cells are variously described as endothelial, epithelial, mesothelial, glandular, and, more latterly, as modified connective-tissue cells. The term mesothelial is the most informative. Pertinent questions are:

(1) Does the synovial lining differ from the underlying connective tissue and, if so, in what respects?
(2) Is the lining comparable with that of serous cavities, such as pleura or peritoneum?
(3) What rôle does the lining cell play in the economy of the joint, in production of synovial fluid or in its removal?

According to Vaubel (1933a and b) synovial cells differ from fibroblasts in tissue culture by their fibrinolytic activity and their ability to produce a mucin-like substance in detectable quantities. He suggests that they be designated synovioblasts. Further investigation with hyaluronidase might help to identify this mucin-like product obtained on culture. There is little similarity between normal synovial membrane and the lining of a false joint, where the lining layer consists purely of flattened connective tissue.

---

* An Arris and Gale lecture delivered at the Royal College of Surgeons on June 6, 1945.

Association of Anæsthetists of Great Britain and Ireland

As part of the centenary celebrations of the first administration of ether in Great Britain, a dinner-dance is to be held at the Dorchester Hotel on Saturday, Dec. 21.

Course in Industrial Medicine

A postgraduate course in industrial medicine is to be held at the London Hospital from April 21 to June 19, 1947. It will cover the syllabus for part II of the Royal Colleges' diploma in industrial health, and will include visits to factories. Applications should be sent to Dr. A. E. Clark-Kennedy, dean of the medical college, Turner Street, E.1.

Research into Effects of Nuclear Radiation

A Biological Research Division has been formed in the United States to investigate the effect of nuclear radiations upon living cells and to determine the maximum safe exposure. The division will include the following units: biochemistry, cytogenetics, general physiology, experimental radiology, and a section of coöperative studies. Observations will be based on radiations from nuclear disintegration within a pile.

Pharmaceutical Liaison Committee

This committee has been established to promote contact between the Ministries of Health and Supply on the one hand and the pharmaceutical profession on the other. The first meeting, under the chairmanship of Sir Weldon Dalrymple-Champneys, deputy chief medical officer of the Ministry of Health, was held on Oct. 16. The secretary is Miss C. Mozley-Stark, Ministry of Health, Whitehall, S.W.1.

New Laboratory for U.S. Institute

A laboratory for the study of infectious diseases has been added to the National Institute of Health, at Bethesda, Maryland, as a memorial to the 23 members of the U.S. Public Health Service who have died in the course of their work. The laboratory, which contains six research units, is to be directed by Dr. Charles Armstrong, chief of the division of infectious diseases at the institute.

Scientific Film Association

Two films from Australia (*Neurological Sequelæ of Deficiency Disease seen in ex-Prisoners-of-war*, and *Hydatid Disease of the Liver*) and one from Canada (*This Town is Ours*), which have been presented to the association, will be shown for the first time in Britain at 6 P.M. on Thursday, Dec. 5, in the film theatre of the Wellcome Foundation, 183, Euston Road, London, N.W.1.

Voluntary Work under the National Health Service Act

Speaking last week at Stratford, Mr. Charles Key, parliamentary secretary to the Ministry of Health, claimed that the scope for voluntary work will be just as wide in the future as it has been in the past. "Benefactors should not be put off," he said, "for this valuable outlet for benevolence will be made more attractive by the knowledge that money given to hospitals need no longer be used for their general expenditure. . . . The regional boards, the management committees, the house committees, and many other bodies will provide opportunities for those who wish to serve the public interest. Indeed, we hope that when the preoccupation with finance is removed . . . the scope for voluntary service will be greater than ever before."

Sound Waves to Kill Bacteria

High-frequency sound waves, vibrating at 100,000,000 cycles per second, are being used in the United States to destroy bacteria in food; they are stated to act by producing and rupturing a small air-bubble in the organism. Supersonic vibrations, says a B.U.P. message, have also been used to cut and drill teeth soundlessly and painlessly, though the process is at present too expensive for general application. Mr. Henry von Jenef, a Chicago acoustical engineer associated with the development of the process, claims that it has opened a new field in physical, chemical, and biological research since the sound waves are able to agitate and vibrate chemicals without heating them.

Return to Practice

The Central Medical War Committee announces that Dr. R. J. Buxton has resumed civilian practice at 34, Clarence Road South, Weston-super-Mare, Som.

In announcing on Nov. 2 the formation of a medical committee to advise the Government on the revision of the international list of the causes of death we inadvertently omitted the name of Prof. Arthur Ellis, F.R.C.P.

Appointments

AGASSIZ, C. D. S., M.C., M.D. Aberd., F.R.C.P., D.P.H.: medical superintendent, Queen Mary's Hospital, Carshalton.

COYLE, C. D., M.B. N.U.I.: medical superintendent, Archway group of hospitals, Highgate.

CRAWFORD, J. M., M.D. Edin., D.P.M.: deputy medical superintendent, Darenth Park.

DOUGLAS, A. A., M.D. St. And., F.R.C.S.E., D.P.H.: assistant ophthalmic surgeon, Children's Hospital, Birmingham.

FELDMAN, W., M.D. Lond., M.R.C.P.: medical superintendent, St. Giles' Hospital, London County Council.

FERRABY, G. S., M.S. Lond., F.R.C.S.: deputy medical superintendent, St. Charles' Hospital, London County Council.

HARDING, H. E., D.M. Oxfd: orthopædic surgeon, National Hospital, Queen Square, W.C.1.

INNES, A., M.B.E., M.B. Camb., F.R.C.S.: assistant orthopædic surgeon, Children's Hospital, Birmingham.

KING, A. J, M.B. Lond., F.R.C.S.: director and consultant venereologist, Whitechapel Clinic.

LEEBODY, J. G., M.B. Edin., F.R.C.S.E.: medical superintendent, Fulham Hospital.

LEONARD, F. R., M.B. N.Z., F.R.C.S.: deputy medical superintendent, St. Leonard's Hospital, London County Council.

LILLIS, W. J. P., L.R.C.P.I.: deputy medical superintendent, Western Hospital, London County Council.

MACDONALD, R., M.B. Edin., D.P.M.: first assistant medical officer, St. Lawrence's Hospital, London County Council.

MCEVOY, N. R., M.R.C.S., D.P.H.: assistant M.O.H., Dudley.

MARTIN, R. N., M.B. Belf., F.R.C.S.E.: orthopædic surgeon, St. Bartholomew's Hospital, Rochester.

MASCALL, W. N., M.R.C.S.: medical director, Endell Street Clinic.

MICHIE, E. J. M., M.B. St. And.: senior assistant M.O.H., Aberdeenshire.

MILLOY, J. M., M.B. Glasg., F.R.C.S.: medical superintendent, St. Mary Abbots Hospital.

MOORE, S. H., M.B. Dubl.: medical officer in Colonial Service, Hong-Kong.

PRICE, H. C., M.R.C.S., D.P.H.: deputy M.O.H. and tuberculosis officer, Fulham.

REID, J. C., M.D. Edin.: medical superintendent, Princess Mary's Convalescent Home, Margate.

RIDEHALGH, F., M.B. Camb., M.R.C.P.: chief clinical tuberculosis officer, Leeds.

RONALDSON, G. W., M.D. Glasg., D.P.H.: medical superintendent, Eastern Hospital, London County Council.

SAVORY, M., M.B. Camb., F.R.C.S.E., D.O.M.S.: ophthalmic surgeon, South London Hospital for Women.

TOWNSLEY, G., M.D. Belf., F.R.C.S.: surgeon and radiotherapeutic surgeon, St. Bartholomew's Hospital, Rochester.

WALSH, M. A., L.R.C.P.I., D.P.M.: first assistant medical officer, Tooting Bec Hospital.

WILSON, M. M., M.B. Leeds, D.P.H.: medical officer, Ministry of Education.

Births, Marriages, and Deaths

BIRTHS

FRANKLAND.—On Nov. 21, in London, the wife of Dr. A. W. Frankland—a daughter.

GRIFFITHS.—On Nov. 14, at Chester, the wife of Dr. F. E. Davidson Griffiths—a son.

HATFIELD.—On Nov. 15, at Ongar, the wife of Dr. F. E. S. Hatfield—a daughter.

HEWER.—On Nov. 20, in London, the wife of Dr. A. J. H. Hewer—a son.

HOLT.—On Nov. 17, at Stamford, the wife of Dr. Leslie R. Holt—a daughter.

JOY.—On Nov. 16, at Frome, the wife of Dr. David Joy—a daughter.

MCLAUGHLIN.—On Nov. 21, the wife of Mr. Redmond McLaughlin, F.R.C.S.E.—a daughter.

MITCHELL.—On Nov. 11, at Trieste, the wife of Lieutenant-Colonel P. C. Mitchell, M.C., R.A.M.C.—a son.

PRICHARD.—On Oct. 9, in London, the wife of Dr. J. S. Prichard—a daughter.

SQUIRE.—On Nov. 17, at Solihull, the wife of Dr. J. R. Squire—a daughter.

MARRIAGES

JAMES—WITHERS.—On Nov. 16, at Egerton, Flying-Officer Derrick William James, M.R.C.S., to Elisabeth Courtenay Wright Withers.

O'BRIEN—LEWIS.—On Nov. 5, in London, Daniel James O'Brien, M.B., to Margaret Mary Lewis.

RIDDELL—WILTSHIRE.—On Nov. 16, at Folkestone, Athol G. Riddell, M.B.E., M.B., to Valerie C. Wiltshire.

DEATHS

BOSWELL.—On Nov. 17, at St. Boswells, Henry St George Boswell, M.B. Edin., aged 89.

CAMPBELL.—On Nov. 15, at Castleford, John James Williamson Campbell, L.R.C.P.E., aged 84.

DEAN.—On Nov. 16, at Berkhamsted, Charles William Dean, F.R.C.S.E., aged 86.

GRIFFITHS.—On Nov. 16, at Cardiff, Thomas Elliss Griffiths, M.B. Lond.

LOCKE.—On Nov. 19, at Sedlescombe, George Locke, M.R.C.S., aged 93.

MACGILLIVRAY.—On Nov. 20, at Bad Salzuflen, Germany, Isabel Margaret MacGillivray, M.B. Edin., M.R.C.P.E.

MACPHAIL.—On Nov. 6, in Edinburgh, Alexandrina Matilda Macphail, O.B.E., L.R.C.P.E.

PUTTOCK.—On Nov. 10, at Billingshurst, Reginald Puttock, M.B. Camb.

SEARLE.—On Oct. 29, George Percy Searle, L.R.C.P.E.

WINTER.—On Nov. 20, at Rotherham, Herbert Edmund Winter, M.R.C.S., lieut.-colonel R.A.M.C., aged 85.

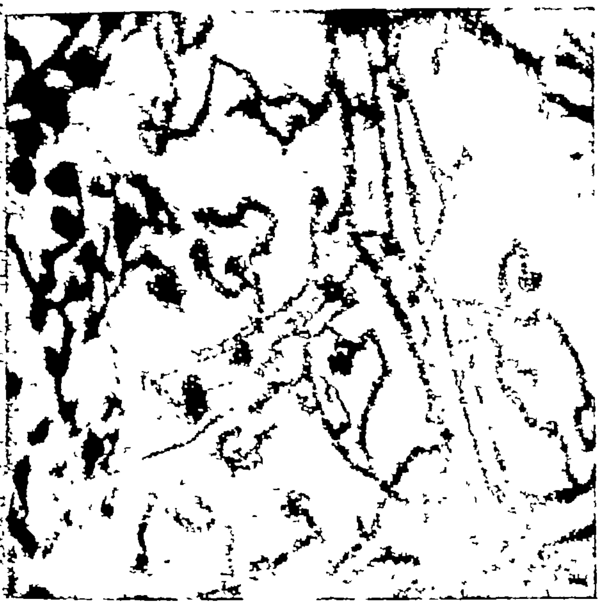


Fig. 4—Fresh synovial membrane from metatarsophalangeal joint of an ox, showing lymphatic vessels injected with Indian ink.

plexuses have been described. This plexus forms wide-meshed irregular polygonal patterns within which are seen numerous blindly ending vessels with terminal moniliform enlargements (fig. 4). The lymph vessels are neither so numerous nor so superficial as the blood capillaries, and no lymph vessels can be traced into the villi of the synovial membrane. The larger lymph vessels draining this plexus pass in groups of twos and threes along the blood-vessels towards the flexor aspect of the joint and communicate freely with the periosteal lymphatics (fig. 5). Few valves are seen in the synovial lymph vessels, but they are numerous in the collecting trunks on the periosteum. The plexus is finer and wider-meshed in the more fibrous types of synovial membrane. The effect of movement on the emptying of the synovial lymphatic vessels is made evident in trying to preserve specimens after injection.

EXCHANGE OF SUBSTANCES ACROSS THE SYNOVIAL MEMBRANE

The exchange of substances across the barrier of the synovial membrane is determined to a considerable extent by the arrangement of the arteries, veins, and lymphatic vessels. Solutions and substances of small molecular dimensions pass through the barrier with rapidity in either direction, mainly if not exclusively through the blood capillary bed. Colloidal particles of larger dimensions, including the proteins, reach the cavity more slowly, and their removal is slower still. This removal takes place by way of the blood capillary and lymph capillary streams. Particulate matter of 100 mm. and more moves slowly into the subsynovial tissue and becomes deposited there, moving no further (Key 1926, Adkins and Davies 1940). After hæmorrhage, hæmosiderin tends to accumulate here in considerable quantities (fig. 6). Exchange across the synovial barrier is increased in acute inflammation (Bauer et al. 1940), but the effects of chronic inflammation seem variable.

In the removal from the joint cavity of particulate matter the synovial cells and phagocytes of the synovial membrane play an important rôle. The rôle of the synovial cells in the exchange of solutions and small colloidal particles is dubious. Though most investigations show that a passive rôle is probable, there are some outstanding anomalies, such as the difference in rates of diffusion of thiocyanate and sugar, recorded by Bauer et al. (1940), and the failure of passage of methyl orange from the blood into the fluid in Engel's experiments (1940). It is probable that differing substances have different rates of transfer across the membrane, and these may differ from joint to joint. There are as yet no comparative data available as to the nature of these differences.

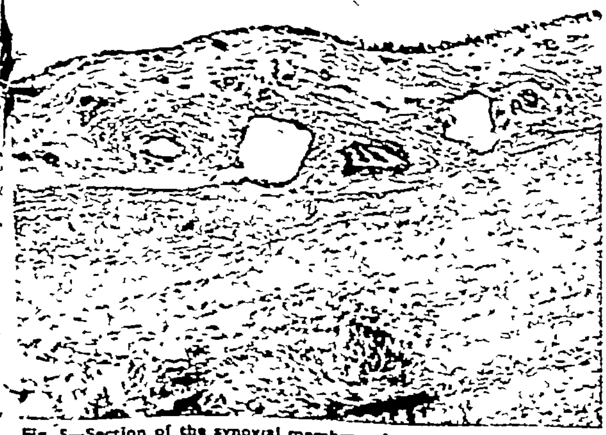


Fig. 5—Section of the synovial membrane from metatarsophalangeal joint of an ox, showing two large lymphatic vessels. Note valves in intervening vein. (×101.)

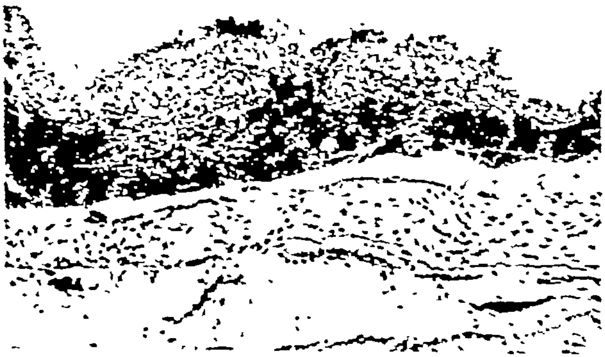


Fig. 6—Section through synovial membrane from a case of torn medial meniscus, showing a collection of hæmosiderin immediately beneath the surface. Stained for iron by the Prussian-blue reaction. (×85.)

Synovial Fluid

The physical characters of synovial fluid vary not only from animal to animal but also from joint to joint in the same animal. Its volume shows well-marked species differences which bear little relation to the size or capacity of the joint in question. The human knee-joint generally contains a small volume (0·2–0·3 c.cm.) of pale straw-coloured fluid of moderate viscosity, whereas the smaller knee-joint of sheep or dog contains a similar volume of highly viscous colourless fluid. In the ox the knee-joint contains about 10 c.cm. of fluid, whereas the ankle-joint has on the average 25 c.cm. and sometimes considerably more. Its viscosity bears no relation to the volume. In the ankle-joint of the ox the fluid is pale yellow and has a relative viscosity of about 5 at 20° C, whereas in the atlanto-occipital joint of the same animal the fluid is generally deep yellow and often sets into a gel at 20° C. Serial changes in character of the synovial fluid are shown in the costovertebral joints of cattle. The fluid is of greatest volume and smallest viscosity in the most anterior joint and progressively decreases in volume and increases in viscosity on passing backwards.

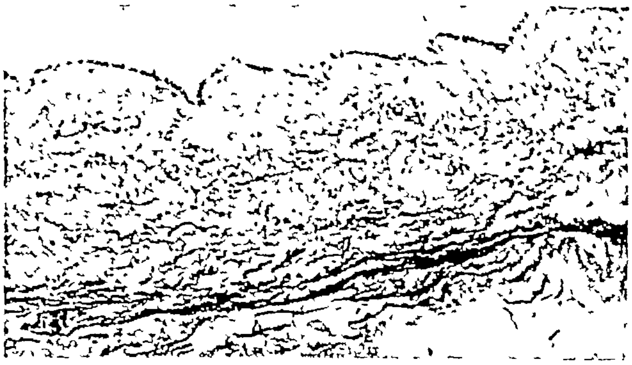


Fig. 1—Section of synovial membrane, from atlanto-occipital joint of an ox, stained with orcein to show elastic lamina. (×85.)

Synovial cells bear little resemblance to the flattened polygonal cells of peritoneum, although both show analogous changes in their response to irritation. They increase in number, enlarge, and retract their processes to become more rounded. According to Cunningham (1922) fibroblasts respond to irritation by becoming more elaborately branched. Synovial cells in small numbers are continually set free in the joint cavity. Their subsequent fate and functions remain obscure.

Key (1925) describes a re-formation of the synovial membrane, after synovectomy, by metaplasia of the underlying connective tissue. Whether the newly formed lining shows reactions analogous to normal synovial cells, and whether the contents of the joint cavity are in any way modified after this procedure, are important problems which remain unsolved.

NERVE-SUPPLY

John Hilton's (1863) statement still remains the most important pronouncement on the nerve-supply of joints:

> "The same trunks of nerves, whose branches supply the groups of muscles moving a joint also furnish a distribution of nerves to the skin over the insertions of the same muscles and—what at this moment more especially merits our attention—the interior of the joint receives its nerves from the same source."

Chief among the features of the synovial membrane is its sensitivity to pain. Localisation is often not highly accurate. To what degree the synovial membrane responds to other sensations, such as tension or pressure, is uncertain. Medullated and non-medullated nerves entering the joint with the blood-vessels form a plexus in the synovial membrane. The non-medullated fibre large part innervate the blood-vessels and are of sympathetic origin. The effects of sympat on the vascular supply of joints remain obscure in view of the paradoxical effects recorded by (1941), need investigation. The synovial mem and its villi show an abundance of free nerve-en presumably subserving pain; end-organs, p concerned with proprioceptive impulses, are described as of the Ruffini, Golgi, Mazzoni, lc knotted types. Pacinian corpuscles are not a char istic feature of the synovial membrane. Gardner (l failed to find them in the capsule, and I confirm Of the articular cartilage William Hunter (1743) said:

> "Insensibility of the articular cartilage is wisely con as by this means the necessary motion of the body performed without pain."

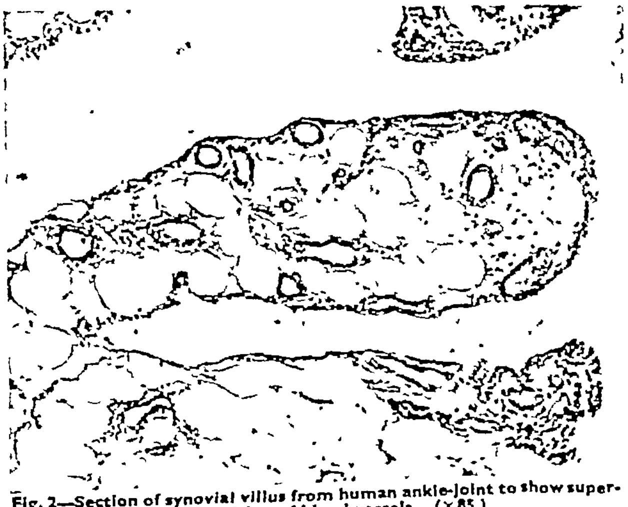


Fig. 2—Section of synovial villus from human ankle-joint to show superficial position of blood-vessels. (×85.)

BLOOD-SUPPLY

Little has been added to the first description of circulus vasculosus articuli by William Hunter in 174

> "All round the neck of the bone there is a great number Arteries and Veins, which ramify into smaller Branches communicate with one another by frequent Anastom like those of the mesentery. This might be called the Cir articuli vasculosus, the vascular border of the Joint."

The capillaries of the synovial membrane are characterised by their richness and superficial position (fig. 2). Small extravasations of blood into the joint cavity are very often found in animals, and some extravasation follows such a simple procedure as puncture (Davies 1944).

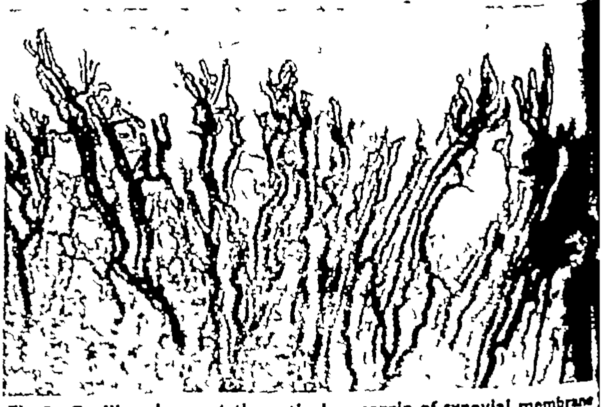


Fig. 3—Capillary loops at the articular margin of synovial membrane in talocalcaneal joint of a man in whom the corresponding femoral artery had been ligated. (×16½.)

At the articular margins the capillaries form delicate anastomosing loops comparable in pattern to those seen in the mesentery (fig. 3). In the villi and fringes the capillaries form delicate tufts supplied by one or more central arterioles. The blood-supply of synovial membrane and capsule communicates freely with the periost and epiphysial supply; hence the shaft of the bo forms one nutritional unit, and the joint cavity and the adjoining epiphyses form another. For this reason Harris (1933) uses the term *circulus vasculosus articuli et epiphyseos* to emphasise the nutritional interdependence of the joint and the epiphyses.

The venous drainage has received little attention. Sappey (Testut 1880) stated that the veins were characterised by their frequent anastomoses, tortuosities, and varicosities. Testut (1880) remarked on their voluminous nature. Occasional valves are seen in the larger veins, even in the more superficial parts of the synovial membrane (fig. 5).

LYMPHATICS

There is only one plexus of lymph vessels in the synovial membrane, though both superficial and deep ssues. Some regard the synovial fluid as the liquid atrix of the joint "tissue," if the cells here merit such name. If the mucin is derived from the matrix of the nnective tissue, it should contain both sulphated and n-sulphated mucopolysaccharides in the proportion which they exist in this tissue. The great variations hich are found in mucin content and viscosity from joint joint are opposed to such a view. Vaubel (1933a d b) has shown that synovial cells in tissue culture aborate a mucin-like substance, but its exact identity unknown. It is, however, a product of cell activity, asing to be produced when the synovioblasts are ansformed to fibroblasts or degenerate. Removal of ynovial fluid from normal joints in cattle is followed ithin less than twenty-four hours by the outpouring nto the cavity of an equal or even larger volume of a luid of high nitrogen content, rich in cells, and of low viscosity. This fluid is less viscous than the normal luid but differs from serum in the presence of mucin. t is probable that raising the viscosity to the normal [illegible] is a slow process and related to further elaboration f mucin by synovial cells. We do not know of any imulus which will increase the mucin content of the fluid.

FUNCTIONS OF THE SYNOVIAL GLAND

These may be summarised as follows:

(1) *Lubrication.*—This is clearly important but not ecessarily the main function. The amount of fluid in ost joints, including even the human, is in excess of t required for lubrication.

) *Nutrition*, particularly of the avascular articular lage.

Maintenance of a *constant fluid medium* within the The water binding power and high osmotic pro- es of mucin are essential to this. The hyaluronic of the mucin and the mucin itself are markedly roscopic.

) Maintenance of a *constant chemical reaction* within the joint. Both the mucin and the calcium are well ited to maintain the reaction of the synovial fluid at a onstant level.

(5) *Protective.*—Mucin in other organs has been shown o protect the tissues against enzyme action and toxins. hough no work has been done on this aspect of synovial nucin, there is reason to believe that it possesses similar rotective functions.

REFERENCES

dkins, E. W. O., Davies, D. V. (1940) *Quart. J. exp. Physiol.* 30, 147.
Bauer, W., Bennett, G. A., Marble, A., Claflin, D. (1930) *J. exp. Med.* 52, 835.
— Ropes, M. W., Waine, H. (1940) *Physiol. Rev.* 20, 272.
Bichat, M. F. X. (1806) Traité des membranes, Paris.
ain, E., Duthie, E. S. (1940) *Brit. J. exp. Path.* 21, 324.
ggeshall, H. C., Warren, C. F., Bauer, W. (1940) *Anat. Rec.* 77, 129.
nningham, R. S. (1922) *Bull. Johns Hopk. Hosp.* 33, 257.
vies, D. V. (1943) *J. Anat.* 77, 160.
— (1944) *Ibid*, 78, 68.
— (1945) *Ibid*, 79, 66.
gel, D. (1940) *Quart. J. exp. Physiol.* 30, 231.
— (1941) *J. Physiol.* 99, 161.
her, A. G. T. (1923) *Lancet*, ii, 541.
rdner, E. D. (1942) *Anat. Rec.* 83, 401.
Harris, H. A. (1933) Bone Growth in Health and Disease, London.
Havers, C. (1691) cited by Todd (1836).
Hilton, J. (1863) Rest and Pain, London.
Hoffman, D. C., Duran-Reynals, F. (1930) *Science*, 72, 508.
— — (1931) *J. exp. Med.* 53, 387.
Hunter, W. (1743) *Philos. Trans.* 42, 514.
Hyrtl, J. (1880) Onomatologia Anatomica, Wien.
Key, J. A. (1925) *J. Bone Jt Surg.* 7, 793.
— (1926) *Ibid.* 8, 666.
— (1928) Special Cytology, ed. E. V. Cowdry, New York, vol. II.
King, E. S. J. (1935) *J. Path. Bact.* 41, 117.
Kling, D. H. (1938) The Synovial Membrane and the Synovial Fluid, Los Angeles.
Lison, L. (1935) *C.R. Soc. Biol. Paris*, 118, 821.
MacConaill, M. A. (1932) *J. Anat.* 66, 210.
Meyer, K., Smyth, E. M., Dawson, M. H. (1939) *J. biol. Chem.* 128, 319.
Testut, J. L. (1880) Vaisseaux et nerfs, Paris.
Todd, R. B. (1836) The Cyclopædia of Anatomy and Physiology, London.
Vaubel, E. (1933a) *J. exp. Med.* 58, 63.
— (1933b) *Ibid*, p. 85.

RELATIONSHIP OF
BENIGN LYMPHOCYTIC MENINGITIS AND GLANDULAR FEVER*

Sir Henry Tidy
K.B.E., M.D. Oxfd, F.R.C.P.
CONSULTING PHYSICIAN, ST. THOMAS'S HOSPITAL, LONDON

Glandular fever was originally described by Pfeiffer in 1889 as an acute infectious disease of children, characterised by rapid painless swelling of the cervical glands, in which suppuration never developed, with slight constitutional symptoms. Hæmaturia alone was noted as an occasional complication. The course was short and uniformly favourable.

Benign lymphocytic meningitis was first clearly described by Wallgren (1925) under the title "acute aseptic meningitis." The principal criteria given for the diagnosis were: (1) an acute onset of meningeal symptoms; (2) the absence of any condition known to cause meningeal irritation and of any acute or chronic infection; (3) changes in the cerebrospinal fluid (C.S.F.) characteristic of meningeal irritation, with an increase in the number of cells, especially lymphocytes, but no organisms; (4) a short mild course of the disease, with no complications; (5) the absence in the community of any disease which characteristically involves the central nervous system.

It is at first sight a far cry between these two supposed entities. Both conditions, however, have extended their boundaries beyond their original conception. Thus, benign lymphocytic meningitis has become linked with certain cases of meningo-encephalitis, of encephalitis, of lesions of the cord, and lesions of peripheral nerves. Glandular fever has extended even more widely. It became temporarily almost a blood disease with the recognition of the mononucleosis in 1920. The discovery of the presence in the blood of heterophil antibodies to sheep's red corpuscles, in which the disease is unique, established the existence of one entity without excluding the possibility of more than one virus. Other clinical and pathological manifestations have been added. Eruptions were found to be not infrequent and may be indistinguishable from rubella or may closely simulate many of the exanthemata. The blood-count at the onset may exhibit a well-marked polynucleosis or a leucopenia or be within normal limits. The long obscure febrile types were gradually recognised (though still often overlooked) in which several weeks may pass with constitutional symptoms only before a slight enlargement of lymphatic glands appears, with a late development of mononucleosis and heterophil agglutinins. This severe febrile type was found to be of almost any duration, short or long. This group, in which the characteristic glandular enlargement is slight and easily overlooked and the constitutional symptoms are more prominent, is of special interest for the question with which we are here concerned.

REVIEW OF PUBLISHED CASES

Epstein and Dameshek (1931) and Johansen (1931) gave the first clear descriptions of neurological complications in glandular fever. It is not intended to give here a review of all published cases but only to refer to those which illustrate the general picture.

Epstein and Dameshek's patient was a young man aged 19 years. The onset was sudden, with headache, malaise, and nausea. Five days later he had become stuporose and restless. On admission to hospital the temperature was 103° F. The C.S.F. was under pressure and contained 34 cells per c.mm., of which 30 were lymphocytes. In subsequent examinations the cells were all lymphocytes. In four weeks all symptoms had passed and the C.S.F. was normal. So far this is the

---

* Glandular fever and infectious mononucleosis are regarded as synonyms.

In many animals the volume seems to be greatly in excess of that required for lubrication (Davies 1944).

The chemical composition of the synovial fluid is still imperfectly known. Bauer and his colleagues regard synovial fluid as a dialysate of serum with added mucin. Apart from the proteins of the blood, urea, uric acid, and amino-acids seem to diffuse freely into the joints. Glucose is found in a lower concentration than in blood, a fact to be explained partly by the consumption of glucose within the joint.

Besides mucin, the synovial fluid contains albumin and globulin, with a predominance of albumin (in a proportion of about 4 : 1), but both in smaller concentration than in serum. This fits in with the greater permeability of the synovial barrier to the smaller albumin molecule. No fibrinogen is found in the synovial fluid. Hence the fluid does not clot, though the mucin may display a "spontaneous" precipitation in sac-like manner on standing (Davies 1944).

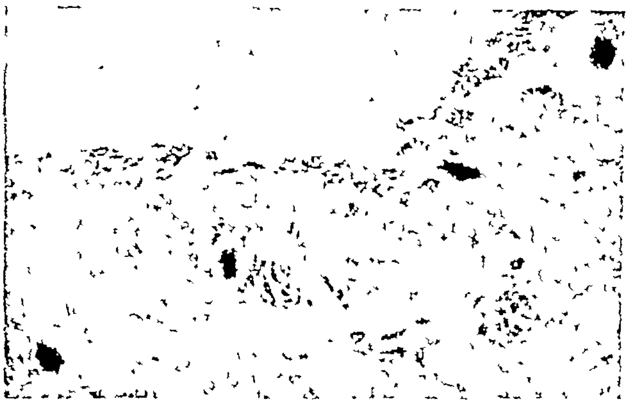


Fig. 7—Section of synovial membrane from ankle-joint of an ox, stained with polychrome methylene-blue to show the metachromatically stained mast cells. (×85.)

The proportions of electrolytes in the fluid are in accord with the Donnan equilibrium theory and resemble closely those in an ultrafiltrate of blood. Compared with serum, there is excess of chloride and bicarbonate, with lower concentrations of sodium, potassium, and magnesium and a similar concentration of inorganic phosphate. The calcium values are high, varying from 6·5–7·0 mg. per 100 c.cm. in the ankle-joint of the ox to 8·0–10 mg. in the atlanto-occipital joint. The calcium concentration is proportional to the mucin content and viscosity of the fluid, part of the calcium being bound to the mucin. The calcium may assist in maintaining the stability of the colloidal systems in the joint and with the mucin may form the main buffer system to keep the fluid alkaline (pH 7·5–7·7).

Apart from these observations there is no information on the variations in chemical composition from joint to joint, but it is certain that the cellular content differs widely.

The synovial mucin is distinct from the sulphate-containing mucins which are found in cartilage, gastric secretions, and ovarian cysts. *It is a sulphate-free mucin,* the viscous polysaccharide component of which has recently been isolated by Meyer et al. (1939) as hyaluronic acid, and found to be identical with the mucopolysaccharide of the vitreous of the eye and of Wharton's jelly in the umbilical cord. The same polysaccharide has also been identified in connective tissue, certain groups of streptococci, and certain tumours. Hyaluronic acid is a substance of high molecular weight, does not dialyse through collodion membranes, is highly viscous, forms salts with the amino groups of various proteins, is non-antigenic, is precipitated by acetic acid, and is apparently identical in all animals. In connective tissues it exists along with a sulphur-containing mu saccharide, probably chondroitin sulphuric acid. viscosity of hyaluronic-acid preparations is decre destroyed by many agents. An enzyme, hyalur which is found in high concentration in testicular and certain other tissues and bacteria, destroys th cosity of hyaluronic acid, then destroys its charact precipitability with acetic acid, and finally hydrol with the liberation of reducing substances. Hyaluro also reacts, though not so vigorously, with some sulphur-containing mucopolysaccharides.

There exists a great deal of uncertainty rega the staining reactions of synovial mucin. It is dou whether, like many other mucins, it stains chromatically with dyes, such as toluidine blue thionin. Lison (1935) reports that metachro staining is obtained with esters of sulphuric acid of molecular weight. I could detect no difference in staining reactions of synovial tissues with these after incubation with the hyaluronidase preparat and I suggest that the polysaccharide does not ex the metachromatic properties characteristic of sulphate-containing mucins and heparin (fig. 7).

CELL CONTENT OF SYNOVIAL FLUID

There are few observations on the cell conten human synovial fluid. Coggeshall et al. (1940), autopsies on 29 human knee-joints aged 32–80 y give a cell count ranging from 13 to 180, with an ave of 63 cells per c.mm.

Studies of the cell content in cattle, sheep, and h show several points of interest. The content of nucle white cells varies considerably from joint to joi the same animal—e.g., in cattle from about 200 per in the appendicular to about 1200 in some of th joints. The count varies from species to species an age within the same species. These variations are wholly explicable in terms of functional differe In general, in cattle the higher cell counts were obta in joints with highly viscous fluids and a marked free from disease and degenerative changes, such as thos the atlas (Davies 1945). Red blood cells do not norm occur in synovial fluid, though small traumatic ex vasations from the delicate capillaries are frequent.

Of the cell types, monocytes form about 50% of total, accompanied by rather fewer clasmatocytes, remainder being lymphocytes, polymorphonuclear le cytes, synovial cells, and unclassed phagocytes. Th is a significant variation in the proportions of th different types from joint to joint and species to spe This field remains unexplored.

THEORIES OF THE ORIGIN OF SYNOVIAL FLUID

That the fluid is more than a transudate is obvi from its mucin content. It cannot be a product degeneration in cartilage, for the mucin of cartilag distinct from that of synovial fluid. Theories that a secretion of certain areas or cells of the synovial n brane in the main depend on the demonstration patches of secretory cells. Havers (1691) thought t the synovial fluid was secreted by the synovial membr over the pads of fat, a view no longer tenable. mucin-secreting cells of the synovial membrane descri by Fisher (1923), Kling (1938), and others are b on metachromatic staining methods. I have inve gated these claims and concluded that the me chromatically staining cells in the synovial membra are mast cells; and, if any function is attributable them, it is that of maintenance of fluidity of the tiss juice. They certainly do not secrete mucin.

Chemical considerations indicate that the synovia a dialysate of blood plasma with the addition of muci The mucin may arise as a secretion of the synovial ce or a product of the intercellular matrix of the synovi andular fever must be looked for carefully, purposely, nd repeatedly, in view of the observations recorded bove. Only thus can glandular fever as an ætiological actor be excluded. Therefore it is pertinent to inquire ow far the published records of cases of benign lymphocytic meningitis give evidence of such examinations. h a search which is not claimed to be exhaustive I have iled to find a single published case in which glandular ever or infectious mononucleosis is even mentioned, much less excluded. Here and there are provoking statements. In the fatal case of Viets and Warren 1937) it is recorded that the white-cell count fell from 7,300 to 8650 per c.mm., but no other information is given. In the first case of Dominic (1937) the leucocyte-count is given as 11,300 per c.mm. (polymorphs 52%, ymphocytes 38%, Türk cells 10%); this might have been the early stage of a mononucleosis.

So far as this literature is concerned, every published case of benign lymphocytic meningitis may have been glandular fever; there is no evidence to exclude it. Naturally one does not put the claim for the association of the two conditions nearly so high as this. Many viruses may become neurotropic. One may note that the virus of glandular fever is probably not far removed from that of rubella; a point worthy of recollection in view of the recent discoveries of the effects of rubella. Writers on the neurological manifestations of glandular fever have almost invariably called attention to the close resemblance to benign lymphocytic meningitis. Epstein (1935) put the position quite clearly. But it must be recorded that Thelander and Shaw (1941) stated that they had seen many cases of benign lymphocytic meningitis and of encephalitis in children which they were certain were not connected with infectious mononucleosis; the evidence is not given.

It is hoped that in future those who diagnose benign lymphocytic meningitis will take all reasonable steps, in accordance with the principles set out above, to ascertain if glandular fever is the causal factor. Cases in which such examinations and observations have not been made cannot be put forward to support the claim that benign lymphocytic meningitis is an entity. At present there are apparently no others to support this view.

SUMMARY

The clinical symptoms, course, and prognosis of benign lymphocytic meningitis and of the neurological manifestations of glandular fever are indistinguishable.

The changes in the C.S.F. are identical in the two conditions.

In glandular fever with neurological manifestations the glandular enlargement is usually slight. This feature, together with mononucleosis and heterophil agglutinins, may only develop after the neurological symptoms have subsided, or may precede the nervous stage.

With the presence of such neurological symptoms, glandular fever can only be excluded by specific and repeated examinations.

Such examinations do not appear to have been performed in general in cases recorded as benign lymphocytic meningitis, and the possibility of glandular fever as a causal factor has consequently not been excluded.

REFERENCES

Dominic, D. (1937) *J. Amer. med. Ass.* 109, 247.
Epstein, S. H. (1935) *Ibid*, 105, 1792.
— Dameshek, W. (1931) *New Engl. J. Med.* 205, 1238.
Fledelius, M. (1935) *Acta ophthal., Kbh.* 13, 150.
Gsell, O. (1937) *Dtsch. med. Wschr.* 63, 1759.
Johansen, A. H. (1931) *Acta med. scand.* 76, 269.
Lancet (1936) i, 670.
Landes, R., Reich, J. P., Perlow, S. (1941) *J. Amer. med. Ass.* 116, 2482.
Pfeiffer, E. (1889) *Jb. Kinderheilk.* 29, 257.
Richardson, J. S. (1942) *Lancet*, i, 618.
Saxena, H. C. (1943) *Brit. med. J.* ii, 267.
Sucher, A., Schwarz, E. (1936) *Wien. klin. Wschr.* 49, 1417.
Thelander, H. E., Shaw, E. B. (1941) *Amer. J. Dis. Child.* 61, 1131.
Viets, H. R., Warren, S. (1937) *J. Amer. med. Ass.* 108, 357.
Wallgren, A. (1925) *Acta pædiatr., Stockh.* 4, 158.

FLUORINE HAZARDS

WITH SPECIAL REFERENCE TO SOME SOCIAL CONSEQUENCES OF INDUSTRIAL PROCESSES

MARGARET M. MURRAY
D.Sc. Lond.
LECTURER IN BIOLOGICAL CHEMISTRY AT BEDFORD COLLEGE FOR WOMEN, IN THE UNIVERSITY OF LONDON

DAGMAR C. WILSON
M.D. Glasg., M.R.C.P., F.R.C.O.G., D.P.H.
FROM THE INSTITUTE OF SOCIAL MEDICINE, OXFORD

IN this country the relation of certain industrial developments to human ecology is not as yet sufficiently appreciated. While it is a part of their function to ensure that the laws relating to the health of workers and public amenities are not infringed, it is not a special duty of Government departments to anticipate new industrial hazards or their secondary social effects.

An outbreak of fluorosis in cattle has once more drawn attention to the large amount of fluorine and fluorine compounds being set free by some recently extended industrial processes and has shown the necessity for consideration of the dangers to public health and to agricultural economy existing in the neighbourhood of these undertakings. At least 28 occupations provide the possibility of such dangers (Sappington 1943). In one industry alone, the manufacture of superphosphate fertilisers, more than 4400 tons of fluorine are "wastefully emptied" into the atmosphere of the British Isles annually (Gill 1946), though methods are known for the control, and in some cases for the further utilisation, of the fluorine liberated. Hazards associated with such fluorine evolution concern not only workers inside the factories but also their families living in the neighbourhood and others resident or employed in the area. They may also have economic consequences through damage to crops and animal stock.

Fluorine is derived from certain volcanic rocks and many different geological formations containing phosphates. Commercially, the main English source of fluorine is fluor-spar (calcium fluoride), but for the special purposes of aluminium manufacture cryolite (sodium aluminium fluoride) is imported from Greenland. In human nutrition fluorine is recognised as having a dual rôle, probably beneficial at one level of intake and definitely harmful at another. As a trace-element, the concentration at which fluorine is effective suggests a catalytic effect and/or an inhibitor action on certain enzyme systems. Epidemiological investigation in the United States, combined with standardised grading of dental fluorosis (mottled enamel), showed less dental caries and more teeth of good structure, with a "mild" degree of white mottling (Dean 1944) among people who had used drinking-water containing fluorine 0·5–1·0 part per million (p.p.m.) for at least the first eight years of life. With higher fluorine levels, staining of the enamel and skeletal changes may develop. In human balance experiments the close correlation between fluorine in the drinking-water and in the urine indicate that elimination of absorbed fluorine is practically complete when the quantity absorbed does not exceed 5 mg. daily (McClure et al. 1945). The provision of the right amount of fluorine in British water-supplies is a matter worthy of further study (Murray and Wilson 1945). Naturally occurring or endemic fluorosis, attributable to water-supplies, and "man-made" fluorosis, due to industrial processes, should be separately considered, though some of their effects may be the same.

In fluorine intoxication the effective poisons are the gaseous fluorine compounds or the fluorine ion; and, whenever fluorine tolerance levels are exceeded, systemic illness and bone abnormalities may develop. Fluorine can affect bone at all ages, leading in man to osteosclerosis, whereas tooth structure can only be influenced during record of a case of benign lymphocytic meningitis. But it was noted on admission that there was general glandular enlargement and the spleen was palpable. The leucocyte-count was 22,000 per c.mm., with 71% mononuclears.

In this case the ordinary manifestations of glandular fever and those of involvement of the meninges were present together and subsided simultaneously.

Johansen's case was materially similar, but in his patient there was no glandular enlargement.

Sucher and Schwarz's (1936) patient was a girl aged 17 years. The onset was with headache and vomiting. Slight glandular enlargement and a palpable spleen were noted a few days later, and there were ataxia, diplopia, and stiffness of the neck. The symptoms were not severe, no lumbar puncture was performed, and in a fortnight she was convalescent and the glands and spleen had subsided. The highest leucocyte-count was 14,000 per c.mm. (lymphocytes 80%). Ten days later the temperature rose again and some glands were palpable; the leucocyte-count was 9300 per c.mm. (polynuclears 65%). In the next fortnight she passed through stages of convulsions, coma, status epilepticus, left hemiparesis, and right oculomotor paralysis to practically complete recovery. The C.S.F. on more than one examination was under increased pressure and contained more than 100 cells per c.mm., all lymphocytes. Throughout this second period of well-marked neurological symptoms the leucocyte-count remained normal—e.g., 7000 per c.mm. (76% polynuclears).

In this case the characteristic features of glandular fever had appeared and subsided before the severe affection of the nervous system became manifest, during which period the blood-count was normal.

The Paul-Bunnell reaction for heterophil agglutinins was now coming into use, and is recorded in all subsequent published cases of neurological manifestations in glandular fever except Gsell's (1937). The reaction has been positive in the blood in all instances except the two cases in sisters, published by Thelander and Shaw (1941). It has never been positive in the C.S.F.

Landes et al. (1941) record the case of a man aged 21 years, whose illness began with severe pains in the calf, lasting twenty-four hours only, followed by headache, vomiting, giddiness, and unsteady gait. He became irritable and lethargic. On admission to hospital on the tenth day he was almost stuporose and speech was difficult to understand. There was no neck-rigidity. The C.S.F. contained a high excess of protein but only 5 cells per c.mm., all lymphocytes. Encephalitis was diagnosed. The leucocyte-count was 11,000 per c.mm. (polynuclears 50%, mononuclears 50%). The pathologist recognised that many types of mononuclear cells were present, and the Paul-Bunnell reaction was positive in a titre of 1 : 1024. By the twenty-second day the patient had lost all symptoms. On this day glands were felt in the neck and groin for the first time, though previously examined for regularly. On the twenty-fifth day the leucocyte-count was 10,100 per c.mm. (mononuclears 78%).

Landes considers that the diagnosis in this case would have been overlooked had not the pathologist tested for heterophil agglutinins. The neurological manifestations suggesting encephalitis had completely subsided before the glands enlarged.

Thelander and Shaw (1941) admitted a man, aged 22 years, with the diagnosis of meningitis. The symptoms were pyrexia, headache, and neck-rigidity. The C.S.F. on admission contained 630 cells per c.mm. (lymphocytes 70%); on subsequent examinations the cells were nearly all mononuclears. The blood on admission contained 15,000 leucocytes per c.mm. (polynuclears 75%). Glands became palpable for the first time on the thirteenth day. On the sixteenth day the leucocyte-count was 9000 per c.mm. (mononuclears 65%). The Paul-Bunnell reaction was positive on the nineteenth day in 1 : 160, and on the twenty-ninth day in 1 : 640. The C.S.F. still contained an excess of cells four months later.

In this case the initial blood-count showed a polynucleosis in spite of the very high lymphocytosis in the C.S.F., and the glands did not enlarge until later.

NEUROLOGICAL SYMPTOMS

Various types of cranial- and peripheral-nerve palsies may develop in glandular fever, such as ocular paralysis (Fledelius 1935), facial paralysis and optic n (Gsell 1937), and serratus-magnus palsy (Rich 1942, Saksena 1943).

I have personal knowledge of several cases neurological manifestations of various types in glan fever which support those cited above without mate adding to them. On these illustrative cases the follo observations can be made:

(1) There is great variation in the neurological manif tions. The symptoms are most commonly meningeal may be meningo-encephalitic or encephalitic, or the c and peripheral nerves may be involved, and v localisations may develop in sequence.

(2) The neurological symptoms may develop together w or before or after the usual characteristic features of glandu fever.

(3) The common characteristics of glandular fever tend be slight, as is usual in its severer forms. The glandul enlargement is usually mild or may be absent.

(4) *During the period of neurological symptoms*, or at le in the early stages, the blood-count may be normal definite polynuclear leucocytosis may be present. (It long been known that at the onset of the severer types *glandular fever the blood-count may show a high de* polynuclear leucocytosis or may be normal or leucopenic.)

(5) The morphological character of the mononuclear ce present is of importance.

The next question is how these neurological sympto in undoubted cases of glandular fever compare with th recorded in benign lymphocytic meningitis. It can, think, be accepted that changes in the C.S.F. are identi in the two conditions, and that there is no difference the duration and prognosis.

The following account of the symptoms of beni lymphocytic meningitis is summarised from an editori in THE LANCET (1936). The onset is acute, sometim preceded by a sore throat. Severe headache is usual the first symptom and is soon followed by other eviden of meningeal irritation or of increased intracrani pressure; stiffness or pain in the neck, back, abdome or limbs; vomiting, restlessness, and insomnia. Drow ness, delirium, and stupor are rare, and convulsio uncommon except in infants. Gross papillœdem pupillary changes, and cranial-nerve palsies do not oft develop. Early pyramidal signs in the arms, trunk, legs may perhaps be found but are not conspicuo The prognosis is excellent. Recovery is rapid, a patients can leave their beds in the third or fourth we of the illness.

Viets and Warren (1937) have published the only fa case of which I am aware. The patient was a man ag 20 years. The onset began with slight headache, follow by attacks of vomiting. On admission to hospital was mentally clear. There was no paralysis of cran nerves. The neck was definitely stiff. There was paralysis of arms or legs. The C.S.F. was under pressu and contained over 300 cells per c.mm. (lymphocyt 98%). The symptoms temporarily improved, but on th thirteenth day he became restless, and he died durin convulsion next day.

The various points of a neurological examination e.g., the condition of the optic fundi and of the reflexes have not been referred to, but it is justifiable to say th the published work reveals no differences between th two conditions.

From a study of the available publications and fro personal experience I can find no points of differenc between the neurological symptoms of benign lympho cytic meningitis and those of glandular fever, or betwee the changes in the C.S.F. in the two conditions.

DIFFERENTIAL DIAGNOSIS

How, then, can benign lymphocytic meningitis an glandular fever be differentiated? One indication woul obviously be that, in a case with the symptoms of benig lymphocytic meningitis, the special characteristics o and other volatile components are driven off, depends on the type of ore and the cost of transport. In this area the ore is mixed, in the field where it is mined, with coal cobbles and slack and "burnt"—i.e., dehydrated—and the resulting cloud of smoke, containing fluorine compounds, drifts over the countryside. The direction of the prevailing wind in this area is shown by deterioration in the growth of field crops in the immediate vicinity of the smoke. Wheat and barley embryos do not mature, and it is customary for farmers to obtain compensation from the mine-owners, based on the difference between the expected and actual grain yield. At the height of calcining the density of fumes may even make driving on neighbouring roads difficult. In one instance a local practitioner, summoned to an accident in daylight, was unable to see where his patient lay.

Farmer X's home, a small brick house with numerous outbuildings, is situated in the midst of his fields, so that "one fence surrounds them all." In this he differs from the owners of the neighbouring fields near the ironstone burning dumps ("cally heaps"), who live elsewhere. A well on his land supplies Farmer X's house; the water, examined twice, has contained 0·4 and 0·6 p.p.m. of fluorine; the higher figure, obtained in wet weather, suggests the possibility of surface percolation of fluorine or its compounds.

Domestic and Habitual Factors Increasing the Hazard.—The house is poorly constructed, and the windows do not fit. All the family suffer when fumes drift over the farm. Food in the larder is exposed to these fumes and is covered with red dust when the calcined ore is loaded for dispatch. Farmer X's daughter (case 3) complained that she could not clean the glass on the windows facing the fumes. Subsequent examination by an expert of a piece of window glass from the bedroom of Farmer X's mother (case 8, with a high excretion of fluorine) has confirmed that the changes on the surface of the glass can be explained as due to the action of hydrogen fluoride.

Occupational and Economic Factors.—During the past six years, since ironstone burning has been carried on more continuously and nearer to the farm, 7 horses and 11 cows have died; young cattle and sheep have been under weight; the sheep also have been lame and had nasal discharge; and much poultry has been lost. But for the war-time increase in agricultural prices the farm would have been abandoned. Farmer X (case 1) has also been very worried about his own health and that of his family. A young labourer (case 9), who chose agriculture instead of military duty and was "directed" to this farm, says he would really enjoy his work but for stomach pain.

Nutritional Factors.—Family X has experienced no shortage of milk or pork; pieces of home-cured bacon can be seen hanging up in the kitchen. Their vegetables, grown round the farm, are of poor quality. Surface contamination of food with fluorine compounds may explain the raised fluorine levels in these people's urines.

Educational Factors.—Until the recent investigation of cattle fluorosis, the significance of fluorine in this area had not been appreciated. Farmer X was convinced

FARMER X'S HOUSEHOLD

Case no.	Description	Age (yr.)	Occupation	Length of residence at farm (yr.)	Previous residence	Degree of dental fluorosis	Symptoms	Urine analysis* (Dr. H. H. Green), fluorine p.p.m. corrected to sp. gr. 1·015	Remarks	Radiological examination
1	Farmer X	38	Farmer	14	Leics	Moderate	Frequent cough, pain in right shoulder, blurred vision unrelieved by glasses, pain over head	2·9	Youngest child of cases 1 and 2 died at 2 months of bronchitis in April, 1941	Slight arthritis of right acromio-clavicular joint; *no lesion seen in chest*
2	Wife of X	41	Housewife	14	Leics, born Notts	(Edentulous)	Loss of appetite and of weight; recent pneumonia; stiffness of left elbow	2·3	..	Old calcified tuberculous lesion in right upper lung; *no lesion seen in left elbow*
3	Daughter of cases 1 and 2	15	Housework	14	Leics	Moderate	Stiffness in both knees and calves, worse in winter	1·6	Has winged scapulæ and a "Rossetti" neck	No lesions seen in chest or knees
4	Son of cases 1 and 2	13	At school, farmwork in holidays	13	..	Moderate	Left leg aches when he runs	4·2	Sleeps facing fumes; window glass etched	No lesions seen in chest or left leg
5	Son of cases 1 and 2	9	Schoolboy	9	..	Mild	Frequent catarrh and cough	Not examined	Sleeps with case 4	Slightly increased markings in chest
6	Son of cases 1 and 2	3	At home	3	..	Moderate in milk-teeth	Pain in knees, legs, and ankles; two attacks pneumonia; continuous bronchial catarrh	2·0	..	No lesions seen in knees, ankles, or chest
7	Father of case 1	78	Shepherd	14	Leics	(Edentulous)	Bronchial catarrh; pain in stomach	Not examined	Sleeps with case 8	No definite lesions seen in chest
8	Mother of case 1	80	Housewife	14	Leics, born Rutland	(Edentulous)	Pain in back and right knee	4·1	Sleeps in room facing fumes, window glass etched	No change in bones of thoracic cage; bones show some increased markings, particularly basal, compatible with congestive change
9	Directed "worker"	18	Agricultural labourer	1	London, S.E.†	Moderate	Gastric upsets	..	..	No lesion seen in chest

* The "corrected values" here take an average normal sp. gr. as 1·015 for the human subject and facilitate comparision of individuals irrespective of water output. An average fluorine figure for human urine on city dietaries may be taken as anything up to 0·5 p.p.m., so long as the water-supply does not itself exceed this figure When it does, the urine figures tend to approximate to the higher water-values (McClure and Kinser 1944). The domestic water used by this household contained 0·6 p.p.m.

† For fluorine figures in various sources of London's water-supply, see Metropolitan Water Board (1936); Murray and Wilson (1945).

development. Gastric derangement is an early diagnostic symptom, and respiratory embarrassment is not uncommon. More precise information on the degree and effects of exposure is obtained by chemical determination of the range of excretion in the urine and, at a later date, by radiological examination of bone. The severity of fluorotic lesions is influenced by the customary diet and bears a definite relation to the economic status of a community (Pandit et al. 1940). Spinal deformity in later life may result from progressive degeneration of malformations laid down in youth; even where fluorine absorption has been excessive, bone symptoms may not be appreciated for some considerable time (Kemp 1946).

EXAMPLES OF FLUOROSIS RECOGNISED IN THIS COUNTRY

Acute Accidental Effects.—(1) Consumption of an insect powder containing sodium fluoride by a farmer's wife (Bell 1936).

(2) Gastric upset, among Nottingham workgirls, from fluorine introduced into cake with a baking-powder prepared from rock phosphate (*Lancet* 1943).

The interdepartmental committee on food standards of the Ministry of Food have now under consideration maximal limits for the fluorine content of calcium acid phosphate sold for use in food (*Analyst* 1946).

Chronic Absorption.—(1) Fluorosis due to *drinking-water:*

Radiological investigations were carried out on Essex children from Maldon, where mottled enamel in Britain was first recognised (Ainsworth 1933). The domestic water has been shown to contain over 3·5 p.p.m. of fluorine, and severe dental fluorosis has been demonstrated and was associated with developmental disturbances of ossification (Kemp et al. 1942).

(2) Fluorosis as an *industrial disease,* from the known use of fluorine:

(*a*) From *fluor-spar:* Wilkie (1940) recognised osteosclerosis radiologically in two Yorkshire workmen occupied in the manufacture of hydrofluoric acid and of aluminium fluoride. Subsequent analyses showed that their daily urinary output was at least four times that of normal controls.

(*b*) From *cryolite* used as a flux in the manufacture of aluminium: the fluorine output of one aluminium factory was studied by the industrial medical research unit under Dr. Donald Hunter (1946). It found that these works handled some 800 tons of cryolite a year, much of which was lost to the atmosphere and settled in particulate form on the surrounding fields, in which grazing sheep and cows developed fluorosis. Inside the factory skeletal fluorosis was demonstrated in 28 out of 264 furnace-men examined, none of whom complained of disability.

(3) "*Neighbourhood*" *fluorosis:*

(*a*) From a known source of *atmospheric contamination* (cryolite): Boddie (1945) recognised fluorosis in sheep on pastures contaminated by the fumes of an aluminium factory $1^1/_4$ miles distant. Alveolar periostitis not only made it impossible for the sheep to chew their food properly but also led to infection of the sinuses of the skull and to obvious purulent nasal discharge.

In the same part of Inverness-shire we found that the local water-supply had a very low fluorine content (0·2 p.p.m.), but we observed "moderate" dental fluorosis in the milk-teeth of young children whose homes lay within the district contaminated by vapours from the factory chimneys.

Such a condition in the temporary dentition is usually associated with a high maternal intake of fluorine. Children using the same water, whose homes lay outside the affected area, did not show mottled enamel.

(*b*) From the unsuspected evolution of fluorine from a *marine clay* used for brickmaking: agriculturists exposed to the fumes of Bedfordshire brick-works (Wilson 1939) complained of respiratory distress.

Bosworth et al. (1941) and Blakemore (1942) studied the onset and prevention of fluorosis among animals in the same neighbourhood. The origin of the fluorine was traced to the local clay used in the brick-factory, which parted with about a third of its fluorine content (550 p.p.m.) at the higher temperatures, above 900° C, of the kiln. Condensed in the flues to an oily mist by association with volatile products from the organic matter in the clay, fluorine drifted down from the contaminating surrounding pastures to a distance of a mile on the leeward side. Fluorine values up to 90 were shown by hay and grass.

Farm animals differed in susceptibility, lactating being the most vulnerable. Cows had such acute ost trophy that they sometimes knelt to eat. Values for f in urine often exceeded 20 times the normal figure.

Control observations on cattle in the neighbourho south-east Lancashire brick-works using clay depos non-marine origin gave negative results.

On a recent visit to the Bedfordshire area we learn fluorine hazards to grazing animals had been temp met by the "ploughing-up" campaign of the war agricu emergency committee.

(*c*) From *coals* as a possible hazard: Crossley (investigated the amounts of fluorine in British coals types, anthracite and bituminous. He determined by r analysis that their fluorine content ranged from 0–175 p and concluded that coals containing over 85 p.p.m. of flu were potentially harmful in industry.

In beer manufacture with the direct type of *kiln* a fluorine in malting coals passes on to the malt; in present dilute state British beers contain only 0·4–1·0 p of fluorine, but considerably more fluorine is present i "culm" (lees) used as a cattle food.

In coal-mines there is intimate association of the flu containing phosphates with the shales of roof and floor, take part in the formation of dust at the coal-face. I suggested (International Labour Office 1940) that pulm changes took place from the inhalation of dust conta both silica and fluorine.

Fluorine is present in the water from some mines and i domestic supplies of many mining communities (Kemp Wilson 1946). Fluorine in coals increased the hazar fluorosis during the local calcination of ironstone (see be

(*d*) From *ironstone calcination:* Green (1946) iden the cause of lameness and cachexia in some Lincol cattle as an effect of the local burning of ironstone.

The urine of four affected animals contained from times the normal amount of fluorine, urinary values of p.p.m. being encountered.

Fluorine in the bones was much increased, values 10,000 p.p.m. in the ash of ribs to 15,000 p.p.m. in the a femur and vertebræ being shown as compared with 500 p in normal bone ash from cattle in other areas.

Water in the cattle drinking-trough did not contain than 0·5 p.p.m. of fluorine.

The ironstone contained about 1200 p.p.m. of flu which came down to about 300 p.p.m. on calcining with slack in heaps on the fields.

The coal contained over 100 p.p.m. of fluorine and therefore another source of contamination. The drifted on to the surrounding vegetation. Near the calc mounds grass showed very high values, up to 2200 p.p.m. more distant stacks, adjacent to the farmhouse, 68–487 p of fluorine. Members of the farmer's household show raised excretion of fluorine in their urine.

We have studied the ultimate and contributory ca and present manifestations of this particular outb of fluorosis, as it affects the public generally.

FARMER X'S HOMESTEAD

Details of Farmer X's family and associated wo are summarised in the accompanying table.

Environmental Factors.—Ironstone workings in s Lincolnshire lie in an agricultural district of low and wide valleys. Mounds formed by the rocky burden of the mining pits stand out from the cultiv land, which is both arable and pasture. Some farms isolated, but many agricultural workers live near s villages. The ironstone industry is of consider antiquity, but since 1939, owing to war-time requ ments, workings have been extended very considera About 25–30% of iron is obtained from this rock, w compares favourably with many imported samp Mining pits are in the form of long trenches 8–40 ft depth; land has only been levelled for return to agri ture when ore is extracted from near the surface.

Whether the ore is conveyed direct to central b furnaces or first calcined, so that hygroscopic moist

RELAPSING BENIGN TERTIAN MALARIA TREATED WITH PALUDRINE

R. D. C. Johnstone
M.D. Lond., M.R.C.P.

TRIALS with 'Paludrine' in benign tertian (B.T.) malaria were carried out under the direction of the War Office and the malaria committee of the Medical Research Council at Colchester Military Hospital, beginning in July, 1945.

The following three different courses of treatment were used, each being given in strict rotation :

(1) Paludrine 0·05 g. daily for ten days.
(2) Paludrine 0·5 g. daily for ten days.
(3) Quinine gr. 30, pamaquin 0·03 g. daily for ten days.

Patients were carefully selected ; for example, those who had been given any treatment before admission to hospital were excluded. In every case there was a previous history of malaria, the vast majority having been proved by blood slide. Between July, 1945, and March, 1946, 324 cases, 108 of each series, were treated.

Blood slides, thick and thin, were taken when the patients arrived in the ward, and in the event of these showing *Plasmodium vivax*, and provided the cases were in other ways suitable, treatment was begun next morning. Above each bed was hung a specially prepared coloured chart on which the nurse responsible entered and signed for each dose of drug given. Every precaution was therefore taken to guard against possible errors in treatment. Each patient was allotted a serial number, and full particulars were entered on a special form devised by the malaria committee. In view of the difficulty of tracing patients after leaving hospital, these particulars included the patient's unit regiment, home address, and "age and service group." This was well rewarded in the final follow-up.

The drugs were given in divided doses, the paludrine twice a day, the quinine-pamaquin three times daily after food ; none of the paludrine cases showed any digestive symptoms.

Patients were confined to bed until they had been afebrile for forty-eight hours, a temperature of over 99° F being considered pyrexial. After the patients had been allowed out of bed, their activities were in no way restricted ; and, apart from ensuring an adequate fluid intake, no special precautions were taken throughout the stay in hospital.

Blood films were examined on the eighth, ninth, and tenth days of treatment in the first 240 cases ; but, owing to shortage of laboratory staff, this was later discontinued. The results of these investigations showed all except one patient to be negative for asexual parasites. This one patient was being treated on the quinine-pamaquin course, and on the ninth day of treatment scanty B.T. rings were seen. Subsequent follow-up showed that this patient was free from relapse after six months.

Patients were normally discharged from hospital on the day following completion of treatment, when they were given two prepaid postcards for return to me. On these was printed a form asking for details in the event of a relapse. Each patient was also asked, in the event of no relapse, to return the first card after three months and the second after six months. Less than 20% of the patients used the cards for the purpose for which they were intended.

RESULTS OF TREATMENT

Immediate.—There was a rapid response to all forms of treatment, and little difference in results was seen in the three series. The number of days of pyrexia were as follows :

Course	*Average no. of days of pyrexia after start of treatment*
Paludrine (0·05 g.)	1·49
Paludrine (0·5 g.)	1·47
Quinine-pamaquin	0·98

Remote.—Six months after discharge from hospital each patient was sent a standard form asking for information regarding further relapses. If this report indicated a clinical relapse, a second questionnaire, about rigors, periodicity of symptoms, duration, and treatment, was sent. From this information the cases were divided into proved relapses, clinical relapses, and no relapses. As the investigations progressed, an increasing number of patients fell into the doubtful category, owing to many of them being demobilised and therefore no longer entitled to treatment in a military hospital.

The response to follow-up was remarkably good, and many patients replied at the first request. Just over 450 letters were required to trace the 324 cases. Every patient in the series has been followed up, and only one has been excluded from the final analysis (table I). This patient had a further attack of B.T. malaria in Cairo, where it was considered he might have been reinfected.

TABLE I—REMOTE RESULTS OF TREATMENT

Course	No. of cases	Free from relapses	One proved relapse	Two or more proved relapses	Clinical relapse	% relapsed	
						All cases	Proved cases
Paludrine (0·05 g.)	108	62	26	7	13	42·6	30·5
Paludrine (0·5 g.)	107	60	23	2	22	43·9	23·3
Quinine-pamaquin	108	91	9	1	7	15·6	9·2

The standard quinine-pamaquin treatment has been used as a *control* in this investigation. The results obtained here may therefore be compared with previous findings, which show relapse-rates of 10·3% proved cases,[1] 11·3% proved cases, and 16·5% total relapses.[2] There is therefore no significant difference in the quinine-pamaquin results, and those obtained with paludrine may be reasonably concluded to be equally accurate.

FACTORS POSSIBLY INFLUENCING RELAPSE-RATE

Captivity.—Of the total series, 89 cases (27·4%) were patients who had been prisoners-of-war in the Far East. Since the relapse-rate of these might be expected to differ from the normal cases, owing to most of them having had very inadequate treatment and very frequent attacks while prisoners, they have been analysed separately (table II). The relapse-rate is higher than in the other cases ; but, since the distribution of prisoner-of-war cases shows almost equal division between the total paludrine and quinine-pamaquin series, it is justifiable

---

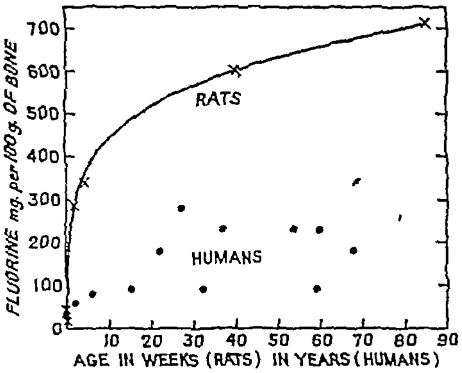
[1] Malaria Committee of Medical Research Council, report M.L.E. 30, 1945.
[2] Johnstone, R. D. C. *Ann. trop. Med. Parasit.* 1946 (in the press).

References continued

McClure, F. J., Kinser, C. A. (1944) *Publ. Hlth. Rep., Wash.* 59, 1575.
— Mitchell, H. H., Hamilton, T. S., Kinser, C. A. (1945) *J. industr. Hyg.* 27, 159.
Metropolitan Water Board (1936) *Rep. metrop. Water Supp.* 1935.
Murray, M. M., Wilson, D. C. (1945) *Lancet*, ii, 23.
Ockerse, T. (1941) *S. Afr. med. J.* 15, 261.
Pandit, C. G., Raghavachari, T. N. S., Rao, D. S., Krishnamurti, V. (1940) *Indian J. med. Res.* 28, 533.
Roholm, K. (1937) Fluorine Intoxication, London.
Sappington, C. O. (1943) Essentials of Industrial Health, Philadelphia.
Shortt, H. E., McRobert, G. R., Barnard, T. W., Nayar, A. S. M. (1937) *Indian J. med. Res.* 25, 553.
Wilkie, J. (1940) *Brit. J. Radiol.* 13, 213.
Wilson, D. C. (1939) *Nature, Lond.* 144, 155.

that both his family and his stock suffered from the ironstone fumes and had sought all possible local diagnostic aid since 1940, but it was only the identification in 1946 of the fluorosis in cattle which provided the clue to the lesser symptoms in the human subjects.

Control Observations.—At a farm adjacent to ironstone pits from which the ore was sent direct to blast furnaces without local calcining there was no sign or history of illness in either the members of the household or in their farm stock. Their domestic water contained 0·35 p.p.m. of fluorine in wet weather. Fluorine in small quantity is to be expected in the local springs deriving their water from the ironstone beds; and inspection of adolescents in five neighbouring villages showed teeth with a "very mild" degree of mottled enamel. At the blast furnaces dealing with this ore no history of *clinical disability* attributable to fluorine was obtained from workmen employed for over fifteen years.



Increase in fluorine content of bones of rats fed 5–7·5 mg. of sodium fluoride a day, and fluorine content of fat-free dried rib bones of persons of different ages resident in London for most of their lives.

DISCUSSION

The absorption of the products of fluorine combustion by the affected cattle consuming heavily contaminated hay and grass was obviously more intense than by Farmer X's family who presumably consumed only small quantities of contaminated foods. The human clinical symptoms are, however, in line with those recorded in chronic endemic fluorosis among people using waters with a raised fluorine content: Argentine (Roholm 1937); China (Lyth 1946); South India (Shortt et al. 1937); North India (Wilson 1939, Khan and Wig 1945); South Africa (Ockerse 1941); United States (Linsman and McMurray 1943).

Judging from the experience of these countries, it was unlikely that skeletal changes resulting from the absorption of fluorine would be appreciable radiologically within the period, about six years, in which Farmer X's household has been exposed to the effects of the intensive ironstone calcination; there is, however, abundant human evidence from other parts of the world that fluorine intake above tolerance levels over a sufficient period (as shown by raised excretion of fluorine) can lead to cumulative absorption and prove harmful to the human organism.

That fluorine must be regarded as a cumulative poison is well established by chemical and experimental observations. The bones of Danish cryolite factory workers contained about ten times that of average persons, the highest fluorine content being found in the worker with longest exposure; osteosclerosis resulted from the daily retention of about 25 mg. of fluorine (Roholm 1937, Brun et al. 1941). Animals given small amounts of sodium fluoride in the diet showed an increasing fluorine content of their bones (Glock et al. 1941). The accompanying figure shows the increase in fluorine content of the bones of rats fed 7–10 mg. of fluorine a day. A series of estimations of the fluorine content of the fat-free dried rib bones of persons of different ages resident in London for most of their lives is given in the same figure; these also show, on the whole, an increase in fluorine content with age.

Etching of window glass in houses facing the fumes should lead to inquiry for possible *clinical* of fluorine absorption. Recently fluorosis was rec in cattle grazing in the neighbourhood of a Shrop colour and enamel factory. Fluorine values in the of the affected cattle ranged from 19–37 p.p.m. W in the animals' drinking-trough did not contain more t 0·6 p.p.m. of fluorine, but there was severe contaminat of pasture, samples of air-dried material show 776–115 p.p.m. of fluorine at distances of 30–600 ya from the factory. During the winter these cattle h been fed on hay cut from another farm, and their expos to fluorine was mainly at grass in summer; their skele lesions were not so pronounced as those of cattle near t brick-works and ironstone dumps (see above); but af three or four years' exposure their molar teeth were w down to the gums, and the permanent incisors w distorted and misshapen. In the windows of an adjace farmhouse etching of the glass by the fumes was reporte it was sufficiently severe to necessitate window-gl replacement by the family every two or three yea Human fluorine hazards in this neighbourhood had yet received attention.

SUMMARY

Fluorine hazards, actual or potential, in this count have been described.

An example has been studied of some importa secondary consequences for dwellers in the neighbourho of certain industrial undertakings.

It is a practical proposition to extract fluorine fro fumes before allowing them to pass into the atmosphe This is already the practice of some firms. In the examp studied the substitution of closed kilns in the burni of ironstone would make the amount of fluorine prese in the ore and coal immaterial from the public heal point of view, but methods for such fluorine control a at present too rarely applied in this country, becau fluorine hazards are not sufficiently appreciated.

An investigation to ascertain the nature and location all industrial processes creating a possible fluorine haza seems to be desirable.

The need for a better intelligence service and coör nating mechanism to ensure collaboration betwe Government departments, industries, local authoriti and research workers is also apparent.

We wish to thank Dr. H. H. Green, of the Ministry Agriculture's veterinary laboratory, Weybridge, for supplyi much information and for his help in many different way our colleague, Dr. F. H. Kemp, for reporting on the rad logical examinations of Farmer X's household, to whom acc was very kindly given by their family doctor and the coun health authorities concerned; Mr. C. N. Bromehead, of t geological survey, for providing data throughout this inquir and Mr. A. C. Pilkington for his examination of glass. W also wish to thank the Medical Research Council for expenses grant.

REFERENCES

Ainsworth, N. (1933) *Brit. dent. J.* 55, 233.
Analyst (1946) 71, 382.
Bell, R. D. (1936) *Brit. med. J.* i, 886.
Blakemore, F. (1942) *Proc. Nutr. Soc.* 1, 211.
Boddie, G. F. (1945) *Ibid*, 3, 110.
Bosworth, T. J., Green, H. H., Murray, M. M. (1941) *Proc. R. S Med.* 34, 391.
Brun, J. C., Buchwald, H., Roholm, K. (1941) *Acta med. scan* 106, 261.
Crossley, H. E. (1944) *J. Soc. chem. Ind., Lond.* 63, 280.
Dean, H. T. (1944) *Amer. J. publ. Hlth*, 34, 133.
Gill, D. (1946) *Inst. Mining Metallurgy Bull.* no. 477, p. 21.
Glock, G. E., Lowater, F., Murray, M. M. (1941) *Biochem. J.* 35, 123
Green, H. H. (1946) *Proc. R. Soc. Med.* 39, 795.
Hunter, D. (1946) *Brit. med. J.* ii, 503.
International Labour Office (1940) Studies and Reports, Series (Industrial Hygiene), London, no. 17.
Kemp, F. H. (1946) *Proc. R. Soc. Med.* 39, 342.
— Murray, M. M., Wilson, D. C. (1942) *Lancet*, ii, 93.
— Wilson, D. C. (1946) *Ibid*, i, 172.
Khan, Y. M., Wig, K. L. (1945) *Indian med. Gaz.* 80, 429.
Lancet (1943) i, 440.
Linsman, J. F., McMurray, C. A. (1943) *Radiology*, 40, 174.
Lyth, O. (1946) *Lancet*, i, 233.

Continued at foot of next page

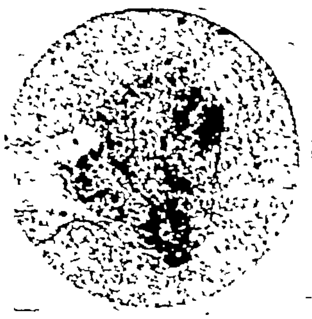


Fig. 1—Anterior sulcus of cervical cord showing an inflammatory focus of lymphocytes and erythrocytes. (Low power, Mann's stain.)

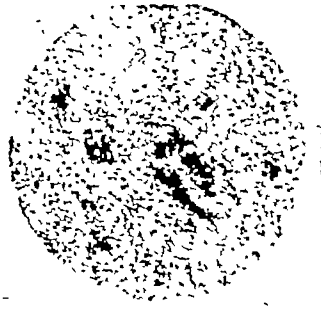


Fig. 2—Left anterior horn of cervical cord showing patches of hæmorrhage. (Low power, Mann's stain.)

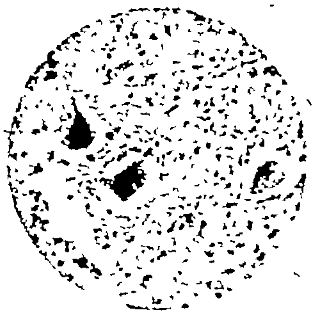


Fig. 3—Degenerating nerve-cells showing destruction of their nuclei—left anterior horn of cervical cord. (Mann's stain.)

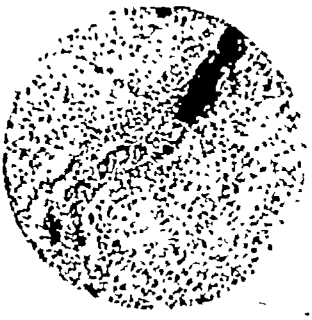


Fig. 4—Left anterior horn of cervical cord showing perivascular cuffing with lymphocytes. (High power, Mann's stain.)

Lumbar puncture was achieved under light 'Pentothal' anæsthesia. Pressure was normal, and there was no spinal block. The fluid showed a slight haze, made more evident on shaking the test-tube, but it cleared on standing. The cell count was 120 per c.mm., with a preponderance of lymphocytes. The fluid was centrifuged, and a smear stained by Gram's method showed no organisms. The patient recovered consciousness but died in his sleep six hours after the lumbar puncture.

Necropsy.—No naked-eye changes were observed in the brain, spinal cord, or meninges, and nothing of note was found in the other organs.

The brain was removed and put into formalin without opening. Sections were taken from the cerebral cortex, the cornu Ammonis, and the cervical cord. They were stained with hæmatoxylin and eosin and by the method of Mann for negri bodies. They were examined by Prof. Vittorio Cilli at the Vaccine Institute, Asmara, a summary of whose report follows:—

"No negri bodies were found in the cornu Ammonis. Apart from a little vascular congestion the brain appears normal. The pia mater in the anterior sulcus of the cervical cord is acutely congested and infiltrated with lymphocytes and erythrocytes (fig. 1). This process extends into the periphery of the cord along the pial vessels.

"The grey matter of the left anterior horn of the cervical cord shows a large hæmorrhagic area speckled with foci of lymphocytes (fig. 2). This area extends into the corresponding posterior horn and into the adjoining right anterior horn. Some of the ganglion cells in this area are degenerate or destroyed (fig. 3). The changes vary from simple wrinkling of the nuclear membrane to karyorrhexis and karyolysis. The cells most affected are those of the left anterior horns. The cytoplasm of the affected cells shows corresponding regressive changes, the tigroid substance in many cells being reduced or absent. No intranuclear inclusion bodies were seen.

"There is infiltration with lymphocytes and erythrocytes in the lateral columns of the left side of the cervical cord. In other parts of the white matter perivascular cuffing with lymphocytes (fig. 4) and erythrocytes was seen.

"The picture is one of acute hæmorrhagic lymphocytic myelitis with spinal leptomeningitis."

Some brain substance was removed from the centre of the brain twelve hours after necropsy and emulsified with normal saline. Two rabbits were each injected subdurally with 0·15 c.cm. of the brain emulsion obtained. Both were reported to be alive and well two months later.

DISCUSSION

At different stages of the illness described, diagnoses of meningitis, acute anterior poliomyelitis, and rabies were considered. These possibilities were discarded in turn, and a diagnosis was made of myelitis due to antirabic vaccine, terminating in a bulbar palsy.

Paralyses from this cause are not uncommonly reported, but in most cases the paralysis is transient and recovery the rule.[1] The explanations put forward fall into two main groups, either a virus or a toxin being held responsible. In cases where living attenuated rabies vaccine has been used—the group in which paralyses most often ensue—the rabies virus in the vaccine is naturally incriminated. In other cases the rabies virus inoculated by the rabid animal in its bite may cause the paralysis, the full picture of rabies being masked by the protective action of the vaccine.[1] Other and more speculative viruses have also been postulated—for instance, a neurotropic virus in the animal brain substance used in making the vaccine, and a dormant potentially neurotropic virus already present in the tissues of the host.

The toxin theory supposes that the heterologous brain substance in the vaccine is toxic to the central nervous system of the host. This may be a direct cytotoxic action or anaphylactic, the patient becoming sensitised by repeated injections.

In the present case it is impossible to say which of these factors was operating. The lack of inclusion bodies in the patient's brain or spinal cord and the negative result of the rabbit inoculations might be held against a virus but do not exclude it. The time of onset of the symptoms, four days after the last injection, does not suggest anaphylaxis.

No other accidents have been reported following the use of this batch of vaccine, and subsequent laboratory investigation of the vaccine for toxicity proved negative. It appears therefore that the patient exhibited an abnormal sensitivity to some chemical ingredient of the vaccine.

I am much indebted to Prof. Vittorio Cilli, director of the Vaccine Institute, Asmara, for doing all the pathological work in this case and for taking the photomicrographs. At his request the sections were also examined by Dr. R. Kirk at the Stack Laboratories, Khartoum, who concurred in the findings. Thanks are also expressed to Colonel W. H. Greany, S.M.S., commanding no. 2 S.D.F. base hospital, for permission to publish this case.

---

[1] Levaditi, C., Lépine, P. Les ultravirus des maladies humaines, Paris, 1938.

"The real division of hospitals at the present time is not between 'voluntary' and 'municipal.' It is between hospitals for the urgent and short-duration patients and hospitals for long-lasting and recurrent illness. . . . From their first sitting the new regional boards should face their responsibilities as a whole. The total hospital demands of the community must be considered together. . . . This is the moment for a change of policy. The needs of invalid children and of the tuberculous are already being met by long-stay hospitals and sanatoria. There remains the immediate task of improvising for the adult and elderly something comparable. . . . A vast programme of construction will be necessary. . . . What is needed more than anything material, however, is an awakening of the whole community to the existence in their midst of a state of affairs often tragic in its melancholy and suffering."
—Sir Ernest Rock Carling in the *Times* (Nov. 25).

TABLE II—RELAPSE-RATE AMONG PRISONERS-OF-WAR AND OTHERS

Course	Total	Free from relapse	Proved re-lapses	Clinical re-lapses	% relapsed	
					All cases	Proved cases
Far East prisoners-of-war						
Paludrine (0·05 g.)	25	12	8	5	52 0	32·0
Paludrine (0·5 g.)	35	13	8	14	62·8	22·8
Quinine-pamaquin	29	20	5	4	31·0	17·2
Other cases						
Paludrine (0·05 g.)	83	50	25	8	39·7	30·1
Paludrine (0·5 g.)	72	47	17	8	34·7	23·6
Quinine-pamaquin	79	71	5	3	10·1	6·3

to include them in the totals provided it is realised that the total relapse-rate is thereby increased.

Return to England.—As relapses are more definite and more likely during the first few months after return to England, the time interval between arrival in U.K. and admission to hospital has been compared in the different series:

Course	*Average months in U.K.*	*Maximum*
Paludrine (0·05 g.)	3·26	11 months
Paludrine (0·5 g.)	3·31	1 year
Quinine-pamaquin	3·13	9 months

There is no bias in favour of any of the three treatments.

Probable Area of Infection.—Since different strains of *P. vivax* may possibly cause relapses at different intervals, the probable area of infection has been compared:

Course	*India-Burma*	*Mediterranean area*	*Far East*	*Others*
Paludrine (average for both courses)	65·5	10·5	30	1·5
Quinine-pamaquin	64	14	29	1

The probable area of infection does not seem to have influenced the relapse-rate in the different series.

INTERVALS BETWEEN RELAPSES

The interval between treatment and proved relapse has been assessed as follows:

Course	*Average no. of days between treatment and proved relapse*
Paludrine (0·05 g.)	65·1
Paludrine (0·5 g.)	53·0
Quinine-pamaquin	43·7

These findings are open to much criticism, as there is no doubt that some patients took occasional and inadequate doses of mepacrine after leaving hospital, though they were advised not to do so. As a result, it is probable that the relapse period in these cases was prolonged.

SUMMARY

Paludrine has been used in the treatment of 216 cases of relapsing B.T. malaria, while 108 control cases have received the standard quinine-pamaquin treatment.

A six-month follow-up has been obtained in all these cases, and the results show a relapse-rate associated with both dosages of paludrine over double that associated with quinine-pamaquin.

No appreciable difference has been noted between the results of small or large doses of paludrine.

This investigation does not include all the relapses, because the period does not cover sufficient time after treatment, it being generally agreed that a second but small peak of relapses is to be expected in the 250–300 day period. Thus one case treated on paludrine (0·5 g.) is here given as "no relapse," having had his first rel 240 days after leaving hospital.

Quinine-pamaquin treatment probably causes temperature to fall to normal slightly quicker than d paludrine.

There is a suggestion that paludrine given in a ten- course causes a longer period of freedom from rel than does quinine-pamaquin, in spite of the high rela rate.

Paludrine given in a ten-day course is effective treating acute attacks of B.T. malaria but in no compares with the standard quinine-pamaquin treatm in controlling further relapses.

I wish to thank Major-General Sir Alexander Bigg consulting physician to the Army, for permission to pub this paper; and many members of the staff of the Colche Military Hospital, especially the nursing sisters and V.A nurses, for their help. I am also indebted to Imperial Chem (Pharmaceuticals) Ltd. for supplies of paludrine.

MYELITIS AFTER ANTIRABIC VACCIN

REPORT OF A FATAL CASE

L. J. BUSSELL
B.M. Oxfd
LATE MAJOR R.A.M.C.

THE pathogenesis of paralyses following treatment w antirabic vaccine is not yet understood. In the c reported here a necropsy was done.

CASE-RECORD

Clinical.—A Sudanese soldier, aged 25, was bitten on left hand and right ankle by a stray dog on Sept. 3, 19 It is not known whether the dog was rabid or not.

Treatment with antirabic vaccine was started immediat A killed carbolised vaccine was used, made from shee brain according to the method of Semple, a 2% emuls being used. Injections were given subcutaneously the abdominal wall in daily doses of 5 c.cm. ca Between Sept. 3 and Sept. 10 seven daily injections w given.

The patient then defaulted and next came under med care on Oct. 31, when he said that the dog was mad, and it decided to give him a further complete course of antira vaccine. Between Oct. 31 and Nov. 14 he was given thirt daily injections as before. Treatment was then stopp On Nov. 18, four days after his last injection, he complai of pain and twitching in his left upper arm and should He was immediately sent into hospital.

On examination there was fibrillary twitching in the mus of his left upper arm and shoulder girdle. Temperature 102° F, and a blood count showed white cells 9600 (po morphs 45%, lymphocytes 44%, mononuclears 9%, eosi phils 2%). His condition remained unchanged u Nov. 20, when it was found that he could not dorsif his left wrist.

On Nov. 21 neck rigidity and head-retraction develop and there was complete flaccid paralysis of his left a Kernig's sign was positive. Temperature 99 2° F, pul rate 140 per minute, respirations 40 per minute. Noth abnormal found in chest and abdomen. The white-cell count 6400 per c.mm. (polymorphs 52%, lymphocytes 42%, mo nuclears 4%, eosinophils 2%). Lumbar puncture attempted but failed owing to the difficulty in flexing back.

On Nov. 22, the day of his death, he presented a pict of acute distress. Temperature 100° F, pulse-rate 130 minute, respirations 45 per minute. Head-retraction prese The fibrillary twitching had ceased in his left paralysed a but was seen in his right arm and in the chest and abdomi muscles of both sides. He had violent uncontrollable spas of the occipitofrontalis muscle and the muscles of the rig upper lip, and had repeated attacks of retching. profuse mucoid discharge came from his mouth a nose. His mental processes were unimpaired. He spo intelligently and complained of pain in the left clavicu region but could not articulate properly and had difficul in swallowing.

days, and subcultures, together with those made from the incubator series, were tested for penicillin production. The results are shown in table II. Differences in yield among the four sets are not significant by the method of assay used. Therefore the treatment did not succeed in producing a strain of 1978B giving a much higher yield of penicillin than the original strain.

COLCHICINE TREATMENT AND SPORE SIZE

Since polyploidy has often been found to be associated with an increase in size of the cells and especially of the haploid pollen grains, it was thought that spore size might be a useful criterion in testing for polyploidy, since the spores of penicillium are uninucleate. Moreover, large-spored strains have been produced by camphor treatment (Sansome 1946). Spore size was examined by mounting spores in physiological saline and a detergent and by making camera-lucida drawings at a magnification of about 1100. The spores of all strains sent by Gordon and McKechnie were found to be of the same average size. The average spore length for 10 spores was found to be as follows: "2n"=3·0 μ, "4n"=2·9 μ, "8n"=3·1 μ, "16n"=3·0 μ.

It was thought that, if polyploid nuclei were formed in the treated samples, these might well become overgrown by haploid nuclei on mass subculture. Dilution plates were therefore made of spores formed on the original treated cultures. The refrigerator series did not form spores in the refrigerator; so after being at 4° C for three weeks they were put into the laboratory at 55° to 60° F until spores were formed.

TABLE II—PENICILLIN PRODUCTION IN STRAINS OF 1978B SUBJECTED TO COLCHICINE TREATMENT AT 4° C AND 24° C AND IN CONTROLS

Strain	Day						Av. of 3 highest consecutive days
	7th	8th	9th	10th	11th	12th	
1249 B21	38	42	53	65	62	66	64
1978B Control at 4° C ..	53	45	59	47	37	44	48
Colch. at 4° C ..	31	45	50	53	55	61	56
Control at 24° C ..	53	49	63	52	45	65	54
Colch. at 24° C ..	48	59	70	62	54	66	64

After plating, single colonies were examined for spore size. Fifty colonies from the colchicine series in the incubator were examined, and all were found to have spores of the same average size as the control—i.e., a length of about 3·3 μ.

There is no evidence therefore that colchicine can induce polyploidy in *P. notatum* at temperatures of 24° C or 4° C. This is in accordance with the results of other workers.

SUMMARY

Treatment of a high-yielding strain of *P. notatum* (N.R.R.L. 1978B) with colchicine at a normal incubator temperature of 24° C and at a low temperature of 4° C did not significantly affect the yield of penicillin given by the strains.

An examination of spore size in fifty colonies from colchicine-treated cultures did not show any with spores of an increased size, such as might be expected to result from polyploids.

Colchicine is therefore believed to be ineffective in inducing polyploidy in *P. notatum.*

REFERENCES

Blakeslee, A. F. (1939) *Amer. J. Bot.* 26, 163.
Gordon, W. W., McKechnie, J. A. (1945) *Lancet*, ii, 47.
Moyer, A. J., Coghill, R. D. (1946) *J. Bact.* 51, 57.
Richards, O. W. (1938) *Ibid*, 36, 187.
Sansome, E. R. (1946) *Nature, Lond.* 157, 843.

Preliminary Communication

INDUCTION OF GLANDULAR CARCINOMAS OF THE PROSTATE IN THE MOUSE

The empirical treatment of human prostatic carcinoma by the administration of œstrogens, or by castration, has been found to offer such promise of amelioration in recent years that there is clearly a need for an experimental investigation of the reactions of transplantable prostatic tumours in animals to hormonal and other factors. If it were possible to obtain a prostatic tumour which grows at a more or less constant rate, which is readily transplantable, and at the same time retains the structural characteristics of a glandular carcinoma, much might be done in testing various synthetic œstrogens and related compounds as possible growth inhibitors, as well as in investigating the more fundamental problem of the factors influencing carcinogenesis in the prostate gland.

By repeated examination of serial biopsy specimens of prostatic carcinoma in man, Fergusson[1] has shown that the administration of œstrogens causes regression of the neoplasm in nearly all cases, but in some the response to treatment is variable. He has emphasised the need for confirmatory observations on prostatic cancer in animals.

Attempts have been made, therefore, to induce transplantable prostatic tumours in rodents by using the carcinogen methylcholanthrene. The present paper is confined to a description of the technique, which is similar in essentials to that used by Rous and Smith,[2] and later confirmed by Greene[3]; but with one important difference—namely, that in our hands the technique has been successfully adapted to produce transplantable tumours from adult, not embryonic, tissues. We believe this to be the first instance of the induction of a series of transplantable tumours arising from adult tissue growing as homologous subcutaneous grafts. A brief description of the prostatic tumours which have been induced in mice, and which are being maintained by repeated transplantation, is included.

TECHNIQUE

The method of tumour induction consists essentially in isolating a sheet or mass of adult tissue, in this case prostatic epithelium, with a minimum of underlying stroma, which is wrapped round a few crystals of the pure carcinogen, and the whole is then transplanted under the skin of a host animal of the same inbred strain.

The epithelium from either the anterior or dorsal lobes of the prostate of six-month-old mice (Strong A inbred strain) was cut into small strips of approximately equal sizes, using a dissecting microscope. Some crystals of 20-methylcholanthrene were placed in contact with the epithelium, which was rolled up and inserted into a Bashford transplanting needle. The grafts were transplanted into male mice of the same inbred strain, care being taken to maintain the carcinogen in contact with the prostatic epithelium and shielded from contact with the subcutaneous tissues of the host.

In 10½ weeks small primary tumours could be identified growing at a fairly uniform rate. It was found possible in a later series of experiments to make as many as three subcutaneous primary grafts on each side of the belly of a single host, and thus to induce a series of individual tumours growing under the same hormonal conditions.

RESULTS

In the first series of experiments fourteen Strong A mice received subcutaneous grafts of prostatic epithelium impregnated with the carcinogen. Twelve of these primary prostatic grafts formed tumours which proved

---

[1] Fergusson, J. D. *Lancet*, Oct. 19, p. 551.
[2] Rous, P., Smith, W. E. *J. exp. Med.* 1945, 81, 597.
[3] Greene, H. S. N. *Science*, 1945, 101, 644.

COLCHICINE INEFFECTIVE IN INDUCING POLYPLOIDY IN PENICILLIUM NOTATUM

E. R. Sansome M.Sc. Durh.

L. Bannan B.Sc. Lond., A.R.C.S.

From the Department of Cryptogamic Botany, Manchester University, and the Biological Laboratories of Imperial Chemical Industries Ltd., Manchester

Gordon and McKechnie (1945) reported the production of strains of penicillium giving successively increased yields of penicillin after successive treatment with 0·2% colchicine under conditions which they described. They attributed the increased yield of penicillin to polyploidy, assuming that the untreated form was diploid; but they did not count its chromosomes, and it is most probably haploid. The first selection, which they found to give about twice as high a yield as the parent strain, they assumed to be tetraploid. The "tetraploid" was again subjected to colchicine treatment, and a new selection assumed to be "octoploid" was made. Similarly, a further treatment of the supposed "octoploid" gave a new selection assumed to be "sixteenploid."

By the courtesy of Dr. W. W. Gordon, who sent cultures of the strains to our colleague Dr. P. H. Gregory, we have been able to repeat the penicillin-production tests under our conditions. The strains were tested by the surface-culture method, and a culture of the commercial strain N.R.R.L. 1249 B21 was tested at the same time. The medium, a modification of that of Moyer and Coghill (1946), was made up as follows:

Lactose	2%
Dextrose	2%
Sodium nitrate ..	0·3%
Corn steep liquor ..	10%
Phenyl acetic acid ..	0·05%
Water; pH adjusted to 5·6 with sodium hydroxide.	

The results of the tests are given in table I. It is clear that none of the strains approaches the yield of 1249 B21; nor did we find the correlation between yield and strain reported by Gordon and McKechnie. In the first test the "4n" strain possibly gave a higher yield than the "2n," and in the second test the "8n" strain possibly gave a higher yield than the untreated strain. The "16n" strain was low in all our tests. However, none of these differences is very striking. The discrepancy between our results and Gordon and McKechnie's may be due to chance. Penicillin yield is a very variable quantity, and the correlation obtained by Gordon and McKechnie between yield and treatment of strain may have been due to chance and may not be reproducible. Alternatively, since penicillium is an unstable fungus, the cultures finally tested by us may have been different in composition from the original cultures tested. Also, there remains the possibility that the treatment has a stimulatory effect which is more or less temporary.

The original results of Gordon and McKechnie seemed to indicate that higher-yielding strains had been obtained, probably by selection from an original mixture of strains; they did not indicate that these strains were polyploid. On the contrary, in view of the work of Richards (1938), Satina (reported by Blakeslee 1939), and others, in which efforts to induce chromosome doubling in fungi with colchicine were unsuccessful, we thought it unlikely that the strains obtained by Gordon and McKechnie were polyploids. A doubling in the yield of a product does not usually accompany the doubling of the chromosome number. *Very often* polyploidy has no effect on the yield of a particular substance. Sometimes it leads to an increase, but not to the extent of 100%.

It seems improbable, therefore, that Gordon and McKechnie's results are due *to* polyploidy. There remain three possibilities.

(1) The improved strains may have been selected by char

(2) The influence of colchicine or cold or both may b led to a selection of the high-yielding strains. It is a comm practice to store cultures in a refrigerator, and so far strains with increased yields have been reported to result fr this treatment. However, in Gordon and McKechni experiment, spores were allowed to germinate and grow in refrigerator, a procedure which might lead to results obtained by storing mature cultures in a refrigerator.

(3) Colchicine or cold or both might have some stimolati effect, possibly of the nature of a "dauermodifikatio leading to an increased yield of penicillin for some time af the treatment.

In view of these possibilities it was decided to rep Gordon and McKechnie's experiments on a high-yieldi strain, using controls for the colchicine and temper ture effects. At the same time efforts were made determine whether or not polyploids were produced as result of the colchicine treatment.

EXPERIMENTAL

The medium used was the modified Czapek-D medium used by Gordon and McKechnie. It was ma up in double strength as follows:

Sodium nitrate	3·0 g.
Magnesium sulphate, $7H_2O$	0·25 g.
Zinc sulphate, $7H_2O$ ..	0·02 g.
Potassium phosphate ..	0·5 g.
Lactose	30·0 g.
Corn steep liquor	80·0 ml. made up to 0·5 litre with tap water.

The pH was adjusted to 5 with 10*N* NaOH.

For the controls the medium was brought to norm strength by the addition of 1 part medium to 1 pa distilled water. For the colchicine samples 1 part of th medium was added to 1 part of 0·4% colchicine in distille water, bringing the strength to 0·2% colchicine. Tube containing absorbent cotton-wool were prepared an sterilised. To each tube was added 1 ml. of spor suspension containing $2{\cdot}9\times10^8$ spores of the strai N.R.R.L. 1978B. The spore suspension was prepared from a seven-day culture on glycerol-molasses-peptone-agar To four tubes 7·5 ml. of the medium was added, and t four other tubes 7·5 ml. of medium and colchicine. Tw control tubes and two tubes with colchicine were place in the incubator at about 24° C, and a similar set in refrigerator at about 4° C.

After four days the incubator cultures showed consider able growth and spore formation. Subcultures were mad on Saboraud's *agar*. An examination of the spore showed no difference in variability of spore size betwee the control and colchicine-treated samples. The sample in the refrigerator showed no obvious growth after fou days. There was a little thin growth after fourteen

TABLE I—PENICILLIN PRODUCTION BY GORDON AND MCKECHNIE'S STRAINS *COMPARED WITH THE* STANDARD PRODUCTION STRAIN 1249 B21

Strain	Day						Av. of 3 highest consecutive days
	7th	8th	9th	10th	11th	12th	
Test 1							
1249 B21	61	66	63	54	..	..	63
G. and McK.'s "2n"	19	24	22	13	..	..	21
,, "4n"	24	24	38	16	..	..	29
,, "8n"	23	26	28	26	..	..	27
,, "16n"	9	12	13	13	..	..	13
Test 2							
1249 B21	38	42	53	65	62	66	64
G. and McK.'s "2n"	11	17	16	13	9	7	15
,, "4n"	5	6	14	12	13	11	13
,, "8n"	24	19	23	23	28	21	25
,, "16n"	13	11	19	9	12	8	15

Medical Societies

LIVERPOOL MEDICAL INSTITUTION

In his inaugural address at the opening of the 110th session, Dr. G. F. **Rawdon Smith**, the president, traced the history of anæsthesia from the day that Adam's rib was removed. At first psychical methods, such as hypnotism, magnetism, and mesmerism, held the field. There were also primitive oral anodynes; and physical devices, variously attributed to the Egyptians, Assyrians, Greeks, and Romans, were introduced and persisted into medieval times. The first mention of inhalation anæsthesia is to be found in Pliny, though some claim that it originated in China. Continuing the record down to the present day, Dr. Rawdon Smith emphasised the improvements during his lifetime, and suggested that the present tendency was to attach overmuch importance to anæsthesia compared with surgery.

At a meeting of the institution on Nov. 7, with Mr. J. B. **Oldham**, vice-president, in the chair, a discussion on the late results of

Partial Gastrectomy for Peptic Ulcer

was opened by Mr. A. **Kirk Wilson**, who described a personal and consecutive series of 148 patients who had undergone partial gastrectomy for simple peptic ulceration between 1934 and 1939. Of these, 104 had gastric, 40 duodenal, and 4 jejunal ulceration. Of the patients with a jejunal ulcer, 3 had a gastrocolic fistula, and in 4 of the patients with a gastric ulcer a gastrojejunostomy had first to be undone. Analysis of the patients by age-groups showed that over 50% of the patients with duodenal ulcers were under forty years of age, while 65% of those with gastric ulcers were over forty. In the same period, 117 cases of carcinoma of the stomach were explored, and among these a partial or total gastrectomy was done 48 times.

Before deciding on operation for a high gastric ulcer, the size of the crater, the degree of penetration and fixation, and the response to medical treatment must first be considered. Ulcers of the pyloric antrum and canal were operated on fairly early because of their tendency to malignant metaplasia. With duodenal ulcers the main indications for operation were repeated perforation and recurrence of symptoms after several courses of intensive medical treatment in hospital.

The Polya-Moynihan operation was done for 44 patients, the Hofmeister operation for 45, and the "physiological" for 59. The over-all mortality was 8%; in exactly half of these deaths, necropsy showed that the cause of death was pneumonia and that healing had occurred without infection in the peritoneal cavity. One pulmonary embolus was recorded, and in 3 cases, where permission for necropsy was unobtainable, a leak from the duodenal stump was suspected.

In more recent series the mortality and morbidity had been much reduced by: (1) more intensive preoperative preparation, to correct minor degrees of anæmia and hypoproteinæmia, and (2) improved anæsthesia. With *d*-tubocurarine the relaxation compared very favourably with that produced by a perfect spinal anæsthetic, and chest complications had not caused any anxiety.

Dr. **Robert Kemp** said it must be remembered that the surgeon operated only on medical failures, and that the physician saw only the bad results of surgery. This paradoxical situation took no account of the good results of both methods. The physician had three duties to his patient in regard to surgery: he must have clear-cut indications in his own mind; he must know the risks and drawbacks of operation; and he must follow up the late results of his advice. With most complicated ulcers and with many gastric ulcers the indications for partial gastrectomy were clear. But with duodenal ulcers each case must be considered individually; and the decision as to when the lesion was beyond permanent help from medical treatment should not be delayed. Apart from the immediate postoperative risks, there were those of later stomal ulcer and, it seemed, an increased liability to pulmonary tuberculosis. After operation the patient might also be handicapped by anæmia, small stomach, dumping, lassitude, malnutrition, gastritis in the stump, and the need for further dieting. Of the 148 patients on whom Mr. Kirk Wilson had performed partial gastrectomy 108 had been followed up; of these, 71 were still alive. No less than 55% of these 71 were in excellent health, doing full work and taking a full diet, with no significant symptoms. In another 28% the patients were in good health and capable of full work, but needed a modified diet. In the remaining 17% the result was only fair; despite dieting these patients still had some symptoms and lost some time from work. In every patient seen the condition was better than before operation. There had been a dramatic change from the miserable life of the man with an intractable ulcer to that of the fit active man without pain and full of gratitude to the surgeon even so long after the operation. The results in duodenal ulcer cases were particularly good. Nevertheless, it was still the physician's duty to keep his patient on a régime strict enough to obviate the need for surgery. If he failed in this the operation should be done under optimum conditions, with full preparation and convalescence in the medical wards. The best permanent results would be obtained by giving patients a simple postoperative régime to follow indefinitely, and by seeing them from time to time to ensure that they did so.

Mr. G. C. E. **Simpson** still felt that there were many cases where gastroenterostomy with ligature of the pylorus was the operation of choice. Before 1939 he would have said first choice, but since deprivation of fats now often prevented satisfactory dieting, he made it the exception. Towards the end of 1942 peptic ulcer had increased in frequency, and he had begun to meet numerous patients with gastrojejunal ulceration, often with colic involvement; in several the gastroenterostomy had been done as long as twenty years before, and they had been able to dispense with dieting. But in 1944 their number had again diminished; the change in the flour might possibly have had an influence. For many years all cases of peptic disorder had been seen on a joint ward round with a physician, and referred afterwards to a dietetic clinic.

Mr. **Cosbie Ross** said that in 160 consecutive gastrectomies 8 patients had died as a result of the operation, making a mortality-rate of 5%. Of these 8 deaths, 3 had been from myocardial failure, 3 from lobar pneumonia, and 1 from a pulmonary embolus; and 1 patient had died during the operation. A further 3 patients had died later, 1 from carcinoma of the œsophagus, 1 from carcinoma of the stomach sac, and the third from a perforated stomal ulcer. This last case was interesting since the ulcer had occurred a year after gastrectomy, previous to which there had been two perforations. With these persistent perforations it might be advisable to prevent further trouble by carrying out an almost complete gastrectomy. Of the patients followed up, 55 had been interviewed and examined, 22 having had the operation for a duodenal ulcer and the remaining 33 for a gastric ulcer. It was a sobering thought that over 75% had had symptoms for over five years and that many of these cases had been in and out of hospital for medical treatment.

Of these 55, not one expressed dissatisfaction with the result of the operation; in fact, 47 were extremely grateful. Of the remaining 8, 2 were ill from other conditions, 1 having advanced phthisis and the second syringomyelia. The other 6, though stating that they were much improved, admitted to mild dyspeptic symptoms, such as heartburn, inability to eat greasy foods, occasional vomiting bouts, or discomfort after heavy meals. None complained of even moderate pain. Except the 2 patients ill from other causes, all were working regularly, though some had changed from their normal occupation to some less arduous work. In this connexion it was interesting that 11 out of the 55 complained of a diminution of strength and energy. The short afferent loop was important in making the anastomosis. Recent experiments had shown that the daily intramuscular injection of 30 mg. of histamine-base in beeswax in laboratory animals caused a torrent of acid secretion, which broke down the capacity of tissue in contact with the acid to defend itself. In a series of gastrectomised dogs the histamine-beeswax technique always produced a stomal ulcer when a long afferent loop was used, and never when a short loop was devised.

to be malignant, and many transplants from these are, at the time of writing, in their eighth generation. Of the remaining implants which did not develop into tumours one was found at necropsy not to have become vascularised. Eleven of these tumours on histological examination proved to be glandular-celled carcinomata and one was a squamous-celled carcinoma.

A study was also made of the early phases of carcinogenesis within primary grafts of prostatic tissue. In this connexion it should be stressed that the technique used, whereby crystals of the carcinogen were placed in direct contact with the living tissue, without using a solvent such as lard or oil, resulted in no foreign-body reaction, and left no residue or necrosis within the graft which might mask or conceal the actual areas where neoplastic changes first arise. In serial sections of primary grafts it was found possible to relate individual invading masses of malignant cells by continuity with the particular alveolus lined with hyperplastic epithelium from which they had arisen. Well-marked hyperplasia was always found to precede the appearance of malignant change.

All types of tumours which developed in the grafts belonging to the first series of experiments were glandular-celled carcinomata (figs. 1 and 2), with the exception of one which was a scirrhous carcinoma.

Secretory activity was a prominent feature of the primary grafts and was surprisingly abundant even in some of the transplanted tumours of the eighth passage. It was common to find prostatic fluid encysted within distended alveoli; the secretory activity seems to depend, as might be expected, on successful vascularisation of the grafts.

DISCUSSION

Previous attempts to induce by experimental means a transplantable prostatic carcinoma in laboratory animals have been only partially successful; thus Moore and Melchionna [4] injected benzpyrene into the prostates of rats and obtained squamous-celled carcinomata and sarcomata, but they gave no information as to whether transplantation of these tumours was successful. Dunning and colleagues,[5] using pellets of methylcholanthrene inserted into the prostate glands of rats, induced squamous-celled carcinomata, and more recently

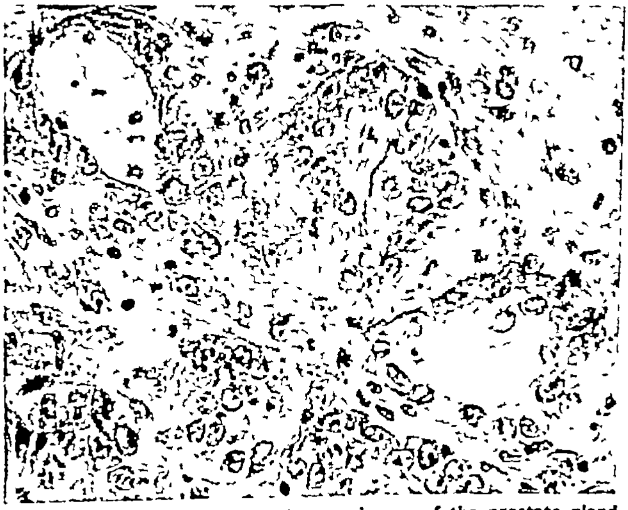


Fig. 1—Section of a primary adenocarcinoma of the prostate gland in a Strong A mouse, induced from normal prostatic epithelium impregnated with crystals of methylcholanthrene and grafted subcutaneously into the belly of a male Strong A mouse. Secretion and cell debris are seen in two alveoli. Several glandular cells are in the process of cell division. This primary tumour has been transplanted and is now in the second passage. (All material was fixed in 'Bouin,' and subsequently stained with Ehrlich's acid hæmatoxylin and eosin.)

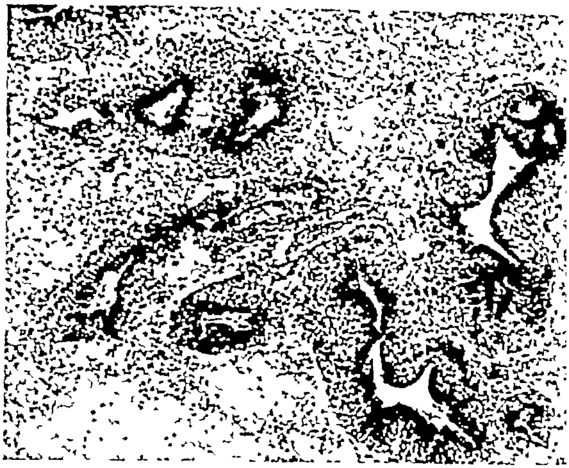


Fig. 2—Section through a glandular carcinoma of the prostate glan a Strong A mouse in the eighth generation of transplants. The tum was induced by impregnating a piece of the prostatic epithelium methylcholanthrene crystals and grafting under the skin.

Horning and Dmochowski [6] obtained transplantable c cinomata by injecting the prostates of pure-line strain m in situ with methylcholanthrene in lard; all these tumo proved however to be squamous-celled carcinoma unlike the common form of prostatic carcinoma in ma

The method adopted in the present experiments l succeeded though on theoretical grounds failure mig have been expected; the fate of homologous grafts ma from adult tissue is usually uncertain. The succe seems partly to be due to the use of a closely inbr strain of mice in which homologous grafting is mu better tolerated than it is in mixed strains. There also reason to believe that results are more uniform the graft is made from a strip of tissue rather than fro a mass of minced fragments, though this point need further investigation. Segregation of the crystals methylcholanthrene by folding the strips of tiss round them would appear to provide the best possib contact between epithelium and carcinogen. The poi of contact between them can be identified more or le precisely, and, further, the carcinogen is shielded by t graft from contact with the host tissues.

In appraising the possible value of transplantab tumours of the mouse prostate for the experiment investigation of prostatic cancer and its hormon treatment in man, it must be admitted that man morphologists do not agree that a strict compariso can be drawn between the various parts of the accesso reproductive glands of primates and rodents.

Whatever homologies one may attempt to dra between the human prostate and the lobulated gland the same name in rodents, it is clear that there exis in the rodent prostate both a fibromuscular stroma an a secretory epithelium identical in the general form of cells with those of the human prostate. Arising like t human gland as a series of outgrowths from the embr onic urethra, the glandular epithelium of the rode likewise depends for the maintenance of its cells on a adequate level of androgen.

It is therefore of great interest to find that, eve although homologies may be uncertain and speci differences often appear to upset the general plan endocrine relationships, the prostatic tumours in mi are surprisingly similar to those found in man, at lea as far as their structural and secretory characters ar concerned. It remains for further experiments t decide whether these similarities can be shown to includ such aspects as relative growth-rates, acid phosphatase secretion, and response to the administration of œstrogens.

E. S. HORNING
M.A., D.Sc. Melbourne.

Laboratories of the Imperial Cancer
Research Fund, London.

---

[4] Moore, R. A., Melchionna, R. H. *Amer. J. Cancer,* 1937, 30, 731.

[5] Dunning, W. F., Curtis, M. R., Segaloff, A. *Cancer Res.* 1946, 6, 256.

[6] Horning, E. S., Dmochowski, L. Unpublished.

MILK MODIFICATION

For Infants and Invalids

Allenburys Dextrin-Maltose consists of rapidly absorbed carbohydrates, chiefly maltose and dextrins, a mixture recognized as highly suitable, in conjunction with milk, for feeding babies, invalids, and persons whose digestive abilities are weak.

It is easily digested, resists fermentation, and counteracts tendencies to diarrhœa. It is better tolerated and may be given more freely than lactose or cane sugar

Its use is indicated in fermentative dyspepsia, in the prevention of diarrhœa (e.g caused by lactose or by bacterial decomposition of carbohydrate), and in undernutrition.

Allenburys

DEXTRIN-MALTOSE

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE: BISHOPSGATE 3201 (12 LINES)

In view of this, the anastomosis should be a retrocolic one close to the duodenojejunal junction.

Mr. A. **Clifford Brewer** had recently collected data on some 362 partial gastrectomies for duodenal ulceration. This analysis was being conducted in the department of surgery of the University of Liverpool. The predominant fact was that where a subtotal gastrectomy was done, with removal of the whole pylorus combined with a Hofmeister stoma, the results were excellent. Where any procedure less than this was performed, and particularly where the pylorus was left behind, results were by no means so good. Where difficulty was encountered from activity of duodenal ulceration, a two-stage operation appeared very satisfactory so long as the second stage was performed within some twelve weeks of the first. It seemed that subtotal gastrectomy was the operation of choice for duodenal ulceration, and in the cases analysed the results had proved eminently satisfactory.

Dr. T. **Cecil Gray** said that spinal anæsthesia probably gave rise to more postoperative chest complications than did general anæsthesia. The improvement today was due not only to a special agent and technique but also, and very largely, to correct preoperative and postoperative care. The importance of good nursing, dental treatment, breathing exercises before and after operation, and active and passive movements to aid the circulation in the recovery period was emphasised. Undoubtedly the use of the barbiturates as the main anæsthetic agent, aided by curare, had enormously improved the prognosis. By exacting criteria the incidence of chest complications in upper abdominal operations was now below 10%.

Dr. H. **Fuld** thought Dr. Kemp had no reason to be gloomy about his figure of 30% for postoperative anæmias. American figures for anæmia following subtotal gastrectomy were 10%; the difference was probably due to the low-grade nutritional anæmia prevalent among hospital patients in this country. Hæmoglobin estimations in 500 unselected patients seen in the surgery during the last twelve months revealed levels of less than 11·5 g. per 100 ml. in more than 20% of patients. In view of the progressive lowering of the operative mortality, it might prove worth while in future to refer patients who developed an ulcer syndrome after the age of forty-five to the surgical expert without much delay.

Reviews of Books

Year Book of Eye, Ear, Nose, and Throat, 1945

Editors: Louis Bothman, M.D.; S. J. Crowe, M.D.; with the collaboration of E. W. Hagens, M.D. Chicago: Year Book Publishers. London: H. K. Lewis. Pp. 540. 18s.

That the fenestration operation has a place in the treatment of the deaf is now incontestable, but a keenly critical approach is still essential. These abstracts show that good results are obtainable in younger patients and in those where bone-conduction is still unimpaired. Cases of so-called catarrhal deafness may be more suitable than otosclerotics, but the differential diagnosis may vary from difficult to impossible. Technique is evidently becoming standardised, and the endaural approach is favoured by American surgeons. Deafness and cataract associated with maternal rubella in early pregnancy have been established as developmental deformities. A large number of abstracts deal with the use of chemotherapeutic substances in different areas of the eye and upper respiratory tract, and some good results obtained with penicillin in cases of intrinsic bacterial allergy are specially interesting. Both surgery and irradiation for laryngeal carcinoma receive support, though both are still crude. Fresh work on the surgical treatment of laryngeal or tracheal stenosis is reported. Treatment of disorders of the ocular muscles is still being revised. Again the bulk of the abstracts are from American literature, and again the high editorial standard is maintained.

Juvenile Delinquency in New Zealand

A Preliminary Study. Eileen Philipp. New Zealand: Council for Educational Research. London: Oxford University Press. Pp. 140. 7s. 6d.

The need for up-to-date and reliable facts about the underlying causes of juvenile delinquency is widely recognised. A valuable contribution to the subject is promised by this book which provides a preliminary study of the nature and extent of juvenile delinquency in New Zealand during the years 1938–45. The writer was trained in the social-science department of an English university and has had wide experience in various branches of social case-work. The figures analysed reveal a striking difference in the proportion of cases of theft to other offences in New Zealand compared with other countries, the proportion being roughly 30% lower than, for example, in England, U.S.A., or Australia. This is thought to be attributable to the very much more uniform social and economic conditions prevalent in New Zealand. The information available also suggests a relatively heavy incidence of delinquency among Maori boys, in all probability associated with the lamentable housing conditions, although it is thought that unintentional discrimination, and readiness to bring a Maori child before the court, may have some bearing on these figures. The main body of the book is concerned with an attempt to draft a form on which a summary of the social history can be recorded for the information of the children's court. A novel feature is the fact that the personal social histories are obtained from the delinquents themselves. The summaries, of which five examples are given, illustrate the complexity of the influences to which delinquency has been a response, and, as the writer says, should help "to correct the over-simplified ideas on causation still widely current." Although emphasis is laid on environmental influences as shown by a tendency to recommend removal from the home as an essential part of treatment, the fact that similar circumstances may have very different effects upon the behaviour of individual children is not overlooked. Useful suggestions are made regarding the lines along which further study of delinquents might be pursued.

Manual of Diagnosis and Management of Peripheral Nerve Injuries

Robert A. Groff, M.D., lieut.-colonel, M.C.A.U.S., formerly assistant professor of surgery, Jefferson Medical College; Sara Jane Houtz, B.S., first lieutenant (P.T.) A.U.S. London: J. B. Lippincott. Pp. 188. 30s.

This little book, written primarily for physiotherapists, deals shortly with the anatomy, injuries, symptomatology, and treatment of peripheral nerve injuries. A full account of the tests of muscle function, including line drawings illustrating every test described, is followed by a series of beautiful anatomical drawings of the regions of the body most susceptible to nerve injury. The physiotherapist will find the first section easily read, and its subject matter should be sufficiently comprehensive for examination purposes. The section on muscle testing is detailed and useful for reference. The anatomical diagrams are no doubt of use to a student who is only concerned with the anatomy of the nerve and muscle, but have less to recommend them to doctors, to whom the book is also dedicated.

Heredopathia Atactica Polyneuritiformis

A Familial Syndrome Not Hitherto Described. Sigvald Refsum. Oslo: Johan Grundt Tanum. Pp. 303.

This book deals with an intensive study of two unrelated Norwegian families in which the author finds evidence of a disease not previously recognised, and which he has named heredopathia atactica polyneuritiformis. One or more of the five persons in these two families presented signs of hemeralopia, atypical retinitis pigmentosa, chronic polyneuritis, ataxia, and other cerebellar phenomena. Three patients showed electrocardiographic signs of sinus tachycardia. Lumbar puncture showed albumino-cytological dissociation with a normal cell count and a great increase of the albumin and globulin content. He thinks the syndrome hereditary, and promises further light on it when pathological anatomical studies by his colleague, Dr. Cammermeyer, on the patients coming to post-mortem examination have been completed.

THE LANCET

LONDON: SATURDAY, DEC. 7, 1946

Death in the Fireplace

It has been demonstrated beyond question that in the homes of the people we neglect the most elementary precautions against accident, and wantonly permit hazards that would arouse a public scandal in the most primitive factory or workshop. This is particularly vicious because the persons at risk in the home—chiefly old folk and children—are less disciplined and less able to look after themselves than adult workers in a factory. Nearly two years ago Wright[1] drew a sombre picture of avoidable suffering and death in the home, caused by burns and scalds. Since then further studies have been pursued in the Birmingham Accident Hospital; and in March of this year Gissane[2] confirmed Wright's findings and urged *immediate action to enforce the provision of* fire-guards and to abolish highly inflammable materials for clothing. Another solemn and urgent warning now comes from Colebrook.[3] Looking first at the loss of life, he points out that, although there has been a substantial reduction in fatal burning accidents during the last two generations, no less than 6516 people in England and Wales died from these causes in the quinquennium 1935–39—and that 2825 of the victims were children. He estimates from his own data that more than 90% of the deaths followed burning and scalding in the home rather than at the place of work.

This shocking waste of life reflects only feebly the sum of human suffering and the loss to the community as a whole. Few calamities leave deeper scars on mind and body. It is true that recent advances in the control of infection have done much to save life and to relieve suffering; and the great achievements in plastic surgery go far to mitigate the permanent disability; but the sum of misery to the victim and his relatives is still enormous. The loss to the community is hard to assess. In terms of working days Colebrook gives a conservative estimate, based on hospital experience in Glasgow and Birmingham, of an average disability of 50 days for severe cases, and of 20 days for those treated as outpatients Taking no account of the patients treated at home, this gives an annual total of more than a million man-days, and there is a similar total for "child-days" lost to schooling. Burning accidents, moreover, represent a serious expenditure in hospital and other medical and nursing services. The inpatients alone account for about a million bed-days a year, and outpatient services are heavily taxed because of the well-known tendency of burns to slow healing in the later stages of recovery, and the frequent need for protracted physiotherapy.

In his survey of the historical background of burning accidents in the home Colebrook remarks on some puzzling features. As one might expect, there has been a considerable fall in the total number of fatal burning accidents, especially in the age-group 0–4 years, during the past fifty years, while in people over 65 the number of deaths has steadily increased. But the sudden drop, far more pronounced in burns than scalds, immediately after the first world war is more difficult to account for. There is clearly a need here for a more detailed statistical analysis. In recent years fatal scalding accidents in children under 5 have involved more boys than girls; but the number of deaths from burning, at all ages over 4, has been much higher among females than males, especially in little girls and old women. We do not know nearly enough about the figures in relation to the population at risk, but some of the factors involved in the reduction in fatal accidents can be put forward with confidence:

1. The replacement of naked candles, gas lights, and oil lamps by electric lights. Candles used by the bedside are still a cause of burning accidents, as Wright showed in her Glasgow investigation.

2. The substitution of modern gas and electric cooking appliances for the open fire and the monstrous kitchen range. Unfortunately a vast number of dwellings occupied by the lower income groups must still rely on obsolete and dangerous appliances, and many burning and scalding accidents are directly or indirectly due to their use. The unprotected gas-ring, often laid on the floor for want of space, is also a villain of the piece.

3. The use of fire-guards (made compulsory when there are children under 7 years in the home) may have had some influence, but Colebrook points out that there is no evidence of this in the returns of the Registrar-General for the years following 1908, when the Children Act introduced this provision. The fact is that the law has always been weakly enforced and in recent years neglected altogether. It should be remarked also that the protection of modern gas and electric fires is often lamentably deficient.

4. The shortening of skirts and the wearing of trousers—especially pyjamas—by women and children has made for greater safety, though not to the same degree in the lower income groups. "On the other hand," Colebrook says, "the change from woollens and tweeds to highly inflammable cotton and silk frocks, nightdresses, dressing-gowns, and underwear has certainly increased the danger of burning accidents." It is doubtful whether this comment can be sustained: the children of the poor have worn inflammable flannelette nightgowns for generations, and countless burning accidents have been reported from this cause.

The home background of all these accidents is a web of the commonplace; the tragedy lies in the fact that we do so little about it. In the broadest sense, bad housing and overcrowding are the principal ministers of death. There is no room for the children to play, except around the grate. Kettles and saucepans are often upset, because the grates are ill designed or out of repair. Overcrowding of both persons and equipment makes it difficult to keep dangerous things in safe places, and to prevent children from interfering with them. Fire-guards for coal, gas, and electric fires are absent or utterly inadequate. The garments of women and children are commonly made of

---

1. Wright, M. T. *Lancet*, 1945, i, 155.
2. Gissane, W. *Ibid*, 1946, i, 326.
3. Colebrook, L. *Mon Bull. Min. Hlth & E.P.H.L.S.* October, 1946, p. 214.

THE LANCET

LONDON: SATURDAY, DEC. 7, 1946

Death in the Fireplace

It has been demonstrated beyond question that in the homes of the people we neglect the most elementary precautions against accident, and wantonly permit hazards that would arouse a public scandal in the most primitive factory or workshop. This is particularly vicious because the persons at risk in the home—chiefly old folk and children—are less disciplined and less able to look after themselves than adult workers in a factory. Nearly two years ago **Wright**[1] drew a sombre picture of avoidable suffering and death in the home, caused by burns and scalds. Since then further studies have been pursued in the Birmingham Accident Hospital; and in March of this year **Gissane**[2] confirmed **Wright**'s findings and urged immediate action to enforce the provision of fire-guards and to abolish highly inflammable materials for clothing. Another solemn and urgent warning now comes from **Colebrook**.[3] Looking first at the loss of life, he points out that, although there has been a substantial reduction in fatal burning accidents during the last two generations, no less than 6516 people in England and Wales died from these causes in the quinquennium 1935–39—and that 2825 of the victims were children. He estimates from his own data that more than 90% of the deaths followed burning and scalding in the home rather than at the place of work.

This shocking waste of life reflects only feebly the sum of human suffering and the loss to the community as a whole. Few calamities leave deeper scars on mind and body. It is true that recent advances in the control of infection have done much to save life and to relieve suffering; and the great achievements in plastic surgery go far to mitigate the permanent disability; but the sum of misery to the victim and his relatives is still enormous. The loss to the community is hard to assess. In terms of working days **Colebrook** gives a conservative estimate, based on hospital experience in Glasgow and Birmingham, of an average disability of 50 days for severe cases, and of 20 days for those treated as outpatients. Taking no account of the patients treated at home, this gives an annual total of more than a million man-days, and there is a similar total for "child-days" lost to schooling. Burning accidents, moreover, represent a serious expenditure in hospital and other medical and nursing services. The inpatients alone account for about a million bed-days a year, and outpatient services are heavily taxed because of the well-known tendency of burns to slow healing in the later stages of recovery, and the frequent need for protracted physiotherapy.

In his survey of the historical background of burning accidents in the home **Colebrook** remarks on some puzzling features. As one might expect, there has been a considerable fall in the total number of fatal burning accidents, especially in the age-group 0–4 years, during the past fifty years, while in people over 65 the number of deaths has steadily increased. But the sudden drop, far more pronounced in burns than scalds, immediately after the first world war is more difficult to account for. There is clearly a need here for a more detailed statistical analysis. In recent years fatal scalding accidents in children under 5 have involved more boys than girls; but the number of deaths from burning, at all ages over 4, has been much higher among females than males, especially in little girls and old women. We do not know nearly enough about the figures in relation to the population at risk, but some of the factors involved in the reduction in fatal accidents can be put forward with confidence:

1. The replacement of naked candles, gas lights, and oil lamps by electric lights. Candles used by the bedside are still a cause of burning accidents, as **Wright** showed in her Glasgow investigation.

2. The substitution of modern gas and electric cooking appliances for the open fire and the monstrous kitchen range. Unfortunately a vast number of dwellings occupied by the lower income groups must still rely on obsolete and dangerous appliances, and many burning and scalding accidents are directly or indirectly due to their use. The unprotected gas-ring, often laid on the floor for want of space, is also a villain of the piece.

3. The use of fire-guards (made compulsory when there are children under 7 years in the home) may have had some influence, but **Colebrook** points out that there is no evidence of this in the returns of the Registrar-General for the years following 1908, when the Children Act introduced this provision. The fact is that the law has always been weakly enforced and in recent years neglected altogether. It should be remarked also that the protection of modern gas and electric fires is often lamentably deficient.

4. The shortening of skirts and the wearing of trousers—especially pyjamas—by women and children has made for greater safety, though not to the same degree in the lower income groups. "On the other hand," **Colebrook** says, "the change from woollens and tweeds to highly inflammable cotton and silk frocks, nightdresses, dressing-gowns, and underwear has certainly increased the danger of burning accidents." It is doubtful whether this comment can be sustained: the children of the poor have worn inflammable flannelette nightgowns for generations, and countless burning accidents have been reported from this cause.

The home background of all these accidents is a web of the commonplace; the tragedy lies in the fact that we do so little about it. In the broadest sense, bad housing and overcrowding are the principal ministers of death. There is no room for the children to play, except around the grate. Kettles and saucepans are often upset, because the grates are ill designed or out of repair. Overcrowding of both persons and equipment makes it difficult to keep dangerous things in safe places, and to prevent children from interfering with them. Fire-guards for coal, gas, and electric fires are absent or utterly inadequate. The garments of women and children are commonly made of material that burns like a torch. Beneath all these objective factors lies human failure through carelessness, stupidity, and neglect of elementary precautions.

---

[1] Wright, M. T. *Lancet*, 1945, i, 155.
[2] Gissane, W. *Ibid*, 1946, i, 326.
[3] Colebrook, L. *Mon. Bull. Min. Hlth & E.P.H.L.S.* October, 1946, p. 214.

The situation calls for immediate action. Cheap and efficient fire-guards, preferably fixed or hinged to the appliances, should be designed, and their use enforced by law. The manufacture of dangerous fittings ought to be forbidden under a safety code of standards. As COLEBROOK says, the level of awareness of danger can be raised among older children and adults by propaganda, films, radio talks, exhibitions, and other educational measures: "Such propaganda would necessarily encourage the general use of effective well-designed fire-guards; of clothing for children and women which is relatively fireproof (this should be certified by appropriate markings on the material); of fittings on the top of gas and electric stoves which would make it difficult to upset saucepans and kettles." Manufacturers of appliances and of clothing might well lead the way; and local authorities planning houses should review the safety measures which ought to be taken. To frame a long-term policy of safety in the home we need far more information than we possess today. The causes of minor burning accidents may show a different distribution from those of serious cases. More effective measures of prevention may be found when we know more about causes. A comprehensive survey is not easy to organise, but there are many willing helpers. The department of the chief scientific adviser to the Ministry of Works, in coöperation with the Ministry of Health, has already started a series of investigations, and the assistance of medical officers of health, housing managers, medical practitioners, and others is being sought. It is important that a long-term policy should be founded on accurate and comprehensive knowledge, but we know enough to take immediate measures of protection.

Splenectomy

THE oddest thing about the spleen is that it should exist at all as a separate organ. It is an unpaired structure of considerable size, complex design, and exceedingly rich blood-supply; yet its total removal is compatible with perfect health. Indeed, if we are to believe the ancients and the evidence of more recent animal experiment, its presence is a positive embarrassment to those who aspire to athletic distinction. Every student knows that the spleen is a part of the reticulo-endothelial system and that it is therefore concerned with such matters as the formation of lymphocytes, the destruction of erythrocytes, the elaboration of antibodies, and the metabolism of lipoids, blood-pigments, iron, and possibly purines. But the only positive function which the spleen as a separate structure appears to subserve is to hold in reserve several hundred cubic centimetres of blood which can be added to the circulation in the emergencies of violent exercise anoxæmia or hæmorrhage. Many other functions have been postulated, only to remain, for lack of evidence, fascinating speculations. Perhaps the most interesting of these hypotheses is that the spleen exerts a hormonal influence on the bone-marrow and that the benefits of splenectomy for thrombocytopenic purpura and Banti's disease are derived from abolition of this influence. The mystery surrounding its functions and the doubts which exist on the indications for its removal must responsible for the large volume of surgical writing on the spleen. It would otherwise be curious surgeons should pay so much attention to an for which there is, in practical effect, only one surgical procedure—to wit, excision.

There are three absolute indications for tomy: rupture, familial acholuric jaundice (usually called spherocytic icterus in the United States) and primary thrombocytopenic purpura. Rupture of the spleen, whether its symptoms are manifested at once or delayed, and whether it occurs in a normal or a diseased organ, is perhaps the only indication for operation on the spleen in which the surgeon knows the precise reason for his intervention and why the operation is curative—it stops an almost invariably fatal intraperitoneal hæmorrhage. The rationale for splenectomy in acholuric jaundice is not so definite. It prevents the spleen from destroying a blood cells, but in some cases the erythrocyte fragility is restored to normal by the operation, suggesting that the spleen may play a more complicated rôle than that of destructor and may influence the erythroblastic activity of the bone-marrow. Whatever the underlying explanation of the results, they are so good in practice that splenectomy is abundantly justified. Much the same is true of primary thrombocytopenic purpura. Here the results are very satisfactory provided the case is really primary and not connected with menstruation, pregnancy, or drugs; some authorities maintain that the disease is due not to excessive platelet destruction by the spleen but to its more oblique activity in inhibiting megakaryocytes. One might add to these three absolute indications a fourth class to contain those often described but seldom seen entities, ectopia, cysts, and primary tumours of the spleen, but here the diagnosis is seldom made before the abdomen has been opened.

There are some diseases in which the effects of splenectomy are so uncertain that they constitute a relative indication for operation. Banti's syndrome heads this list, and the work of the spleen clinic of the Columbia Presbyterian Medical Centre, lately reported by WHIPPLE,[1] has gone far to explain the uncertain results of splenectomy in this disease. The cause of the enlarged spleen is portal hypertension, and WHIPPLE has relieved the signs and symptoms in advanced cases by anastomosing the portal vein to the vena cava. He believes that splenectomy is helpful only where the splenic vein alone is obstructed and that it will do harm in most cases by destroying useful collateral channels. WHIPPLE does not discuss the cause of the anæmia in Banti's syndrome and one is left to wonder whether erythrocytes dammed back in an enlarged spleen naturally suffer abnormal destruction or whether the spleen has exerted a sinister influence on erythropoiesis. STIVEN[2] has reported favourable results from splenectomy in Egyptian splenomegaly, a condition which clinically resembles Banti's syndrome; but since this is probably a manifestation of schistosomiasis, the benefits of splenectomy must fall short of cure. There are further conditions in which the removal of a vast spleen, though not curative, affords great mechanical relief, and chronic malaria and kala-azar, as well as Gaucher's disease, may on rare occasions benefit thus from operation. Lastly, there is the group of cases distinguished by Prof. C. A. DOAN of Ohio—primary splenic neutropenia and panhæmatopenia—in which a persistent neutropenia in the former and anæmia, neutropenia, and thrombopenia in the latter are accompanied by signs of overactivity in the corresponding bone-marrow cells; DOAN recommends splenectomy for both these conditions.

---

[1] Whipple, A. O. *Ann. Surg.* 1945, **122**, 449; see *Lancet*, 1946, i, 743.
[2] Stiven, H. Société Internationale de Chirurgie, 10th Congress, 1936.

The contra-indications to splenectomy are important. It is obviously useless where a moderate splenic enlargement is a manifestation, but not an essential part, of a generalised disease. Thus in Hodgkin's disease and lymphosarcoma splenectomy is a mistake. In leukæmia it is a fatal mistake. Its problematical benefits in pernicious anæmia have been displaced by liver therapy, and in icterus gravis neonatorum transfusion with rhesus-negative blood is its happy successor. With the proper indications, the mortality of splenectomy can be minimal. PUGH,[3] in a recent review, points out that the mortality for the original operation was 100%, but that this figure has now improved almost to zero. At the Mayo Clinic, for 1003 cases operated on over forty years, the figure was 9·4%; at the Lahey Clinic in Boston there has not been a single operative death from splenectomy since 1941; PUGH himself reports 15 splenectomies in which there was only 1 death, and that was reasonably attributed to a severe intracranial injury. It is likely that most surgeons would put the mortality of splenectomy at about 10%; but in fact, if traumatic cases are excluded, this is too high; the key to success is really effective coöperation between physician and surgeon in the selection of cases and the time for operation, and in the management of convalescence.

An essential part of splenectomy, except in cases of rupture, is a careful search for spleniculi, which must be removed if permanent results are to be achieved.

Fluorosis—Endemic and Man-made

IT is not yet certain that fluorine is essential to full health, as other trace elements such as iodine are known to be. There is evidence, however, that when optimal amounts are available during growth it increases the resistance of the teeth to caries. Like iodine, fluorine is present in varying amounts in drinking-waters. Unlike iodine, which produces harmful consequences by its defect, fluorine does so by its excess. In various parts of this country, and notably at Maldon, in Essex,[1] it gives rise to dental fluorosis with unsightly mottling of the teeth. In parts of China where it is present in the water in great excess it causes gross skeletal changes with severe disabilities and sometimes death.[2] In at least one or two areas in England where dental fluorosis occurs, osteochondral changes in the vertebræ have been discovered in adolescents; it seems probable that an association of fluorosis with poor social and nutritional status is here responsible.[3]

In addition, however, to endemic fluorosis there is another hazard present in and near certain industries which give rise to fluorine fumes or smokes. Elsewhere in this issue Dr. MARGARET MURRAY and Dr. DAGMAR WILSON give a useful summary of information bearing on both endemic and man-made fluorosis, together with a report of a local "incident." HUNTER [4] and his colleagues have studied the industrial and some of the secondary neighbourhood risks of fluorine smokes evolved by aluminium works. Grass and crops may be contaminated, especially on the leeward side of certain industries, to a considerable distance, and disease and death in sheep and cattle due to cropping of contaminated grass have been reported.[5] [6] MURRAY and WILSON discuss the fuller public-health and social consequences of such a hazard in the neighbourhood of an area devoted during the war to surface iron-ore calcination. They mention further that some 28 industries in this country give rise to fluorine emanations, and suggest that the nature and degree of the risk to farm stock and human beings is not at present sufficiently appreciated by those responsible for all the industries concerned or by local authorities.

No such catastrophe as the "fog disaster" in the Meuse valley in 1930 has been recorded in the British Isles. On this occasion a thick cold mist lay over parts of Belgium. The smoke from a number of factories became mingled with the fog. Several thousand people developed pulmonary symptoms and there were 60 deaths, chiefly among old people. Of the 27 factories in the neighbourhood, 15 employed fluorine-containing substances involving the possibility of passing gaseous fluorine compounds into the chimney smoke.[7] Window-panes and electric bulbs lost their gloss more quickly than usual. Cattle, after grazing a short time, contracted serious bone disease; but, as the bony effects of fluorosis are very slow to arrive, this evidence must be accepted with caution. The whole episode was held to incriminate fluorine as the probable chemical cause of the disaster.

Such a combination of adverse circumstances is unlikely to be repeated, but, even were it impossible, there is clearly a case for the more detailed study of specific chemical hazards of this kind. We do something approaching our best to protect water and food from contamination, but the air we breathe can still be a source of danger. According to a recent statement by Mr. HERBERT MORRISON, as reported in the daily press, atmospheric pollution costs us £50 million a year, irrespective of its effects on the health of the people and their amenities. A great deal of this pollution is preventable. Some of the waste-products of industrial processes—fluorine among them—are not only recoverable but valuable. It seems that a major cause of delay in handling problems of this kind may be the lack of machinery for coördination between industry, the public-health services, a number of Government departments, and those research-workers who by their individual or collective initiative disclose evils we must all desire to abolish.

---

[3] Pugh, H. L. *Surg. Gynec. Obstet. Int. Abstr Surg.* 1946, 83, 209.

---

[1] Ainsworth, N. *Brit. dent. J.* 1933, 55, 233.
[2] Lyth, O *Lancet*, 1946, i, 233.
[3] Kemp, F. H., Murray, M. M., Wilson D. C. *Ibid*, 1942, ii, 93.
[4] Hunter, D. *Schweiz. med. Wschr.* 1946, 76, 917; see *Brit. med. J.* 1946, ii, 303.
[5] Bosworth, T. J., Green, H. H. *Proc. R. Soc. Med* 1941, 34, 391.
[6] Boddie, G F. *Proc. Nutr. Soc.* 1945, 3, 110.
[7] Roholm, K. Fluorine Intoxication London 1937

Annotations

A POSTGRADUATE SCHOOL AT CAMBRIDGE

In 1944 the Goodenough Committee pointed to an opportunity at Cambridge to develop a postgraduate centre for doctors from this country or overseas who want advanced and specialist training. A beginning, they suggested, might well be made by setting up research and training units based on Addenbrooke's Hospital and on "the strong departments already existing in the University in the fundamental sciences." Part of this plan has become fact. The university has established departments of experimental medicine and radiotherapeutics for which the hospital is providing beds. Beds have also been put at the disposal of the regius professor of physic, and the honorary staff of the hospital has been strengthened by additional appointments. Further arrangements have now been made for the university to assume responsibility for the pathological and biochemical services of the hospital. Hitherto the university departments of pathology and biochemistry have been concerned only with research and teaching. Now their work is to cover clinical and pathological material from the hospital, and bacteriological and epidemiological material from the East Anglian region; and Dr. A. M. Barrett, Dr. M. H. Gleeson White, and Dr. N. R. Lawrie have respectively been appointed university morbid anatomist, bacteriologist, and biochemist to Addenbrooke's.

So far has been so good that the university and hospital have decided that they are now ready to carry the scheme a big step further, and a school of clinical research and postgraduate teaching is to be initiated, consisting of the departments of experimental medicine and therapeutics (already in being) in association with the university departments of medicine, anatomy, pathology, biochemistry, experimental psychology, and physiology. The regius professor of physic will be chairman of the council of the school, which will include the heads of the departments, and representatives of the faculty boards concerned, the general faculty board, and the general committee and the honorary staff of Addenbrooke's.

It is intended that the school shall share a common site with Addenbrooke's, and its research wards are to be an integral part of the hospital. But according to contemporary custom the scheme must await the builders, and until new premises are erected the hospital will assign some of its own beds to the new departments. The heads of the departments of the school will be elected to the honorary staff of the hospital, and arrangements are being made for the university to be represented on the general committee in whose deliberations they already take a friendly if informal part.

Under the National Health Service Act the hospital and specialist services of the area will be associated with the university, and it is hoped that Addenbrooke's will be designated a teaching hospital. The university has further announced that it is prepared, once the postgraduate school is well established, to consider the possibility of starting a pregraduate school of clinical teaching. The future clearly holds further opportunities and Cambridge is preparing for them.

THE UNMARRIED MOTHER

The illegitimacy-rate, which had been falling steadily since the beginning of the century, was down to 42 per 1000 live births in 1939, but rose with the war, to reach 72 per 1000 in 1944. In a new broadsheet [1] P.E.P. note that two-thirds of the mothers of illegitimate children return either to their family home, to the child's father, or to their legal husbands. The remaining third, who have neither home nor friends behind them, experience social and financial penalties which have changed relatively little since the last century. "Unfortunately, there are still some voluntary hospitals which do not admit unmarried mothers and demand to see the marriage lines of all women applying for beds in public (but not in private) maternity wards." Maternal mortality continues to be higher among single than among married mothers, and the rates for infant mortality, stillbirth, and neonatal death are higher among illegitimate than among legitimate infants. Some of the reasons for the greater risks to the illegitimate child were set out by Dr. G. F. Buchan [2] several years ago. During her pregnancy the mother has to keep herself and prepare for the child; so she may work almost until her confinement. Then, after ten days or a fortnight in hospital, she is discharged, often with nowhere to go, needing to get work at once. Not knowing how to find a foster-parent, she persuades someone to take the child, on a promise of payment out of her first earnings; and if work is not found at once the foster-mother may refuse to keep the child.

There have been advances since Dr. Buchan wrote his article, but not yet on a wide enough scale. The mother can sometimes stay on in a postnatal hospital for a time, breast-feeding her baby and giving domestic help in exchange for her keep. But this is only a temporary measure, and one which some mothers are unwilling to accept; moreover places in such hostels are scarce. The mother's best—almost her only—chance of keeping the baby with her is to take a resident domestic post. If she is unfitted or unwilling to do this she must leave the child in a day nursery while she goes to work, or find lodgings where the landlady is willing to look after the child: but again such landladies are rare, especially in the present housing shortage. Most homeless mothers must consent to be separated temporarily or permanently from their children, placing them in residential nurseries (though these are now fewer than they were during the war) or with foster-parents (now as uncommon as friendly landladies), or allowing them to be adopted, the arrangement often being made casually in a pub or a queue. In the opinion of P.E.P.—

> "A mother, whether married or unmarried, who is without a breadwinner, should be enabled to earn her living and to keep her child with her. This is a problem of lodgings, of sufficient accommodation in day nurseries, and of residential nurseries for emergencies. Working mothers' clubs or hostels with bed-sitting rooms, gas-rings, and nurseries attached might go a long way in solving it; they should be part of the local authority's services for homeless mothers."

Because of the moral issues linked with the question of illegitimacy, most voluntary bodies caring for the welfare of the unmarried mother are religious. Unfortunately there is very little central coördination, and the efficiency of different homes varies very greatly. The religious organisations include the Salvation Army, which never refuses a case, the Church of England Moral Welfare Council, Roman Catholic Diocesan homes, and a few Free Church homes (the last three rarely take second pregnancies, and cases with venereal disease are rigidly segregated in separate homes). There are also some non-denominational homes and hostels. Some of these variously sponsored homes are run on modern lines; others lock their doors, open all letters, and remove all money and notepaper from the residents. There are only about 8 homes for mothers with venereal disease, but it is possible that with modern methods of treatment it may no longer be necessary to segregate such cases.

In November, 1943, the Minister of Health encouraged welfare authorities to meet their responsibilities in this field. He had a good response, 339 schemes being submitted, in 210 of which a moral-welfare association was being asked to coöperate, while in 50 specially qualified social workers were to be appointed, and in others health visitors were to be specially instructed. The homeless mother badly needs the support of an experienced social worker. By the end of 1944 seven new hostels for unmarried mothers and their babies and three residential nurseries had been, or were about to be, opened, and many authorities, following one of Dr. Buchan's suggestions, were arranging to find suitable foster-mothers and to guarantee their payment. P.E.P. would like to see services for the unmarried mother and her child centred in the Ministry of Health and administered as part of the National Health Service. Antenatal and postnatal homes are needed for all maternity cases, and would help to prevent the undesirable segregation of unmarried mothers.

---

[1] The Unmarried Mother. *Planning*, no. 255. Sept. 13, 1946. From P.E.P., 16, Queen Anne's Gate, London, S.W.1.

[2] *Med. Offr*, 1941, 65, 29; see *Lancet*, 1941, i, 302.

PULMONARY ŒDEMA

THERE is now much evidence, both in animals and man, that injected protein solutions usually leave the circulation rapidly, and that protein is removed as well as water and salts. Nevertheless the conception of fixed circulating proteins is still prevalent, and the suggestion is made that an attempt to increase their concentration in the blood will result in large quantities of œdema fluid being drawn out of the lungs.

Writing on pulmonary œdema lately in these columns, Courtice and Foss[1] reached conclusions which seemed diametrically opposed to those of Cleland.[2] But it is essential here to differentiate between two distinct types of pulmonary œdema—that following exposure to irritant gases, and that resulting from an acute rise of pressure in the pulmonary veins. Courtice and Foss studied the former type in dogs and goats and found that injected protein solutions will not correct the hæmoconcentration which follows exposure to phosgene. Arterial oxygen saturation was not followed, but their animals died more rapidly after injection of plasma or serum, presumably from increasing pulmonary œdema. Courtice and Foss conclude that transfusions in the presence of gross pulmonary œdema are therefore definitely detrimental. As Daly[3] has pointed out, however, it is difficult to correlate the results of animal experiments with different types of pulmonary œdema in man.

The second type of pulmonary œdema is commonly seen in lesions of the left side of the heart, but it also occurs when the heart is more normal, as in transfusions after hæmorrhage. The sequence of events is generally thought to be as follows. Initially there is an acute rise of pressure in the pulmonary venous system, and dyspnœa which is probably reflex from this rise of pressure. Peripheral arteriolar constriction occurs and the blood-pressure rises. Cyanosis at this stage is not due to diminished arterial oxygen saturation but to peripheral constriction. The rise of blood-pressure adds to the work of the heart, and dyspnœa probably increases the already high pulmonary venous pressure. Only terminally does arterial oxygen saturation show a conspicuous decrease. All intravenous infusions raise the venous pressure to greater or lesser degree, so that it is difficult to believe that injected protein solutions can do anything but harm in this type of case. Although data obtained in the field are necessarily incomplete and difficult to assess, the clinical improvement observed in some of Cleland's cases after the intravenous injection of concentrated plasma may have been due to the raising of a low venous filling pressure which had resulted from an acute reduction of blood-volume from hæmorrhage or plasma loss.

In the streets of a big city it is not uncommon to see an elderly hypertensive person in the throes of an attack of acute left heart-failure. Well-meaning but misguided bystanders will often attempt to increase the venous pressure still further by insisting that the sufferer should lie flat. There is no reason why the informed physician should follow such courses.

---

1. Courtice, F. C., Foss, G. L. *Lancet* Nov. 9 p. 670.
2. Cleland, G. *Ibid*, p. 667.
3. Daly, I. de B. *Thorax*, 1946, 1, 182.

ARBUTHNOT LANE

Lane was a lion among surgeons, and none the less so because everything that he did led not to critical discussion but to disagreement and contention. In his prime he had three enthusiasms: for operation in cleft-palate children (by an extension of Davies-Colley's flaps) at the earliest possible age and if possible within 24 hours of birth; for fixing every fracture of a long bone with an internal splint, again as early as possible; and for the removal of the colon for a condition, sensed rather than described, which he called "chronic intestinal stasis." The time has not yet come to write a final appreciation of this work—emotion would still sway reason too much—but the time has come to record the dates in his life. This Mr. W. E. Tanner[1] has done, and he has prefixed a chapter on his own life to show how Lane inspired the young men around him.

What was this wizardry that had so great an influence on those with whom and for whom Lane worked? For his patients felt it as strongly as his house-surgeons and were impelled to get well, sometimes from things quite outside those for which their operation had been performed. It lay in his idealism and his sympathy. Like Lister, Lane had an intense sympathy for group humanity, and each of the operations at which he worked was inspired by this. By his cleft-palate operation he strove to give life and human speech to children born with the commonest of the distressing deformities with which human beings come into the world. By his bone-plating he aimed to help the working man, and especially the casual labourer who was thrown out of work when he could not carry a 2 cwt. sack and faced starvation, because in those days there was no sickness benefit, no unemployment insurance, and no workmen's compensation—only the Poor Law Act of 1836, under which he was grudgingly given outdoor relief which meant the loss of his civil rights. Lane threw aside æsthetic estimations of the results of fracture treatment, such as good alignment, and replaced them by standards based on wage-earning capacity. If a man could not return to the work he did before he broke his leg the treatment of that fracture was a failure; and it was this ideal that makes Lane one of the founders of orthopædics. And lastly that sad little group of shrivelled up, greasy-skinned sour-tempered middle-aged women in sympathy for whom he started to open the abdomen; but instead of removing the ovaries or appendices or sewing up the kidneys or the uterus, as other surgeons were doing, Lane concentrated on the gut and therefore devised a hypothesis and an operation. The type of women for whom he did a colectomy have disappeared today, but it was sympathy for their very genuine misery that made Lane try to do more than merely pass them on to a different outpatients' department.

With his sympathy Lane combined a standard of idealism which taught that you must always have an ideal but must never attain to it, for when you find yourself doing so you must push it further away; and with this he incorporated a conscientious scepticism which held that when there was anything in surgery on which all were in agreement it was almost certainly wrong. No man at Guy's more fully followed the motto of the hospital—that it is better to give than to receive. In some ways he received greatly, but whether he took a big fee or only lifelong gratitude he always gave the patient something more than he had taken from him. We must thank Mr. Tanner for bringing out a life of this great man at a time when there is some need of emphasis on these points.

---

1. Arbuthnot Lane: His Life and Work. W. E. Tanner, M.S., F.R.C.S. London: Baillière. Pp. 192. 15s.

PHASE-CONTRAST MICROSCOPY

OBSERVATION of the living cell by transmitted light has been a difficult task, for the refractive indices of the unstained components vary only slightly, and the thickness of a single cell is insufficient to make minor variations observable. Dark-ground illumination is a useful supplementary technique, and intravital staining has yielded further information. Ultraviolet microscopy requires special apparatus and the irradiation kills most tissues fairly rapidly, while the interpretation of observations made on the classical stained section is suspect, for one cannot eliminate the possibility that artefacts are produced by the staining technique. Electron microscopy is still for the few. The phase-contrast technique, first suggested ten years ago, was demonstrated to a meeting of the optical group of the Physical Society on Nov. 22. This brings to a successful conclusion the work of Mr. C. R. Burch, PH.D., F.R.S., and his colleagues at Bristol, who have long championed the idea and at this meeting presented a mathematical analysis of the principles involved.

The phase-contrast technique employs a system for retarding part of the beam incident on the microscope condenser; this is modified in passing through the specimen, and the emergent beam collected by the objective passes through another retard plate placed accurately over the first. The effect is to accentuate by interference the minor differences in phase introduced by the tissue, and so to render visible changes in optical density imperceptible by normal observation. Mr. A. W. Hughes, PH.D., spoke of the tremendous progress now possible in cytological studies, and showed two films made at the Strangeways Laboratories with a home-made simplification of the equipment. This development has also been studied in Germany, and a few examples of the Zeiss equipment are in England. Two speakers remarked that the recently developed British equipment is superior to the German. Old prejudices die hard, but it is time that the old wives' tale that English microscopes are not as good as Continental was discarded.

THE DISPUTE

IT is difficult to write temperately of the decision of certain local authorities to discharge anybody in their service who refuses to join a trade union. Yet presumably this decision seems to them entirely reasonable. "It is generally accepted," says the *Encyclopædia Britannica*, "that the conduct of industrial negotiations in Great Britain must be on the basis of negotiations between organised workers and organised employers," and during the war of 1914–18 the Government themselves, and many employers, encouraged workers in the larger industries to join a union. In big organisations it is obviously more convenient that terms of service should be agreed with the whole body of workers rather than with individuals separately, and there must be a mechanism for appointing plenipotentiary representatives. To a considerable proportion of the people of this country it has become an article of faith that the decent man joins a union so as to stand by his comrades; and those who refuse to join one incur scorn because they stand aside yet profit by the union's efforts—less being said about their suffering through union action of which they may disapprove. When he is elected to the control of a municipal service, the trade unionist naturally thinks of it as a rather untidy industry which needs to be set in order, and related to other industries, by giving everyone trade-union status as a worker with appropriate representation. Unfortunately, to achieve so desirable an end he sometimes holds it permissible to use compulsion —employing the direct action which has won the unions so many victories, and so many members, in the past.

There is no need to repeat here the arguments against this variety of compulsion: the indignation aroused by its application in a new field by the local councils ha been vigorously expressed by many newspapers. We feel bound to add, however, that, rightly or wrongly, salar members of the medical and nursing professions do regard themselves as "employees"; when a doc works for a council his primary duty is still towards patient, and his relation towards the council is not relation of "master and man" which obtains in indus and which forms the basis of trade-union organisati It is true of course that the professional status cheris by doctors and nurses may have elements of snobb (as a correspondent argued in our last issue), but w is much more important is that it provides standa and incentives of high social value, which more than e need preserving now that the financial prizes of succ are diminishing. To outsiders at least, it has seemed t whatever else they may have done, trade unions ha seldom inspired their members to work without reg for time or place or anything but the end in view. doctors require such inspiration; and, until we offered something better, we shall continue to w our professional uniform, because it helps to ke us up to the mark and still attracts likely lads our ranks.

We shall be told perhaps that this is quite irrelevan that nobody thinks of challenging professional statu and that for doctors, dentists, and nurses membersh of a trade union is demanded merely as a matter administrative convenience. Of this it will be easier judge when we know precisely how the councils defi "trade union"—whether strictly as a union affiliat with the Trades Union Congress or loosely as any bo representing workers. In recent legislation Parliame has not apparently favoured a "closed shop" in a narrow sense; for example, the Coal Board are instruct to consult with "organisations appearing to them represent substantial proportions of the persons in t employment of the Board, or of any class of such persons. If the local councils want to find organisations represen ing substantial proportions of the doctors in the employment they need go no further than the Britis Medical Association and the Society of Medical Offic of Health, which, though not trade unions, are recognis by the Government and the public as competent represent doctors on questions of service. If the counci confine themselves to asking that doctors and nurs taking their appointments shall belong to an organisati capable of representing them we shall have to admit th they have a case worth considering. But in a reasonab society, such as we are trying to build, such proposa ought to be put forward in the first place for discussi rather than for compliance. The terms of service doctors working for local authorities are largely the resu of agreement on the national level between all t interested parties, and in our view no big change oug to be imposed locally by individual councils followi their own ideas. We believe in fact that local authoriti like workers, should act through the associations form to represent them.

The independent action of the councils has increas the difficulties of moderate men. Apart from its possib effect on the recruitment of nurses, it has provided bonus for those who oppose the Government's plans f a National Health Service, and Mr. Bevan may not fin it easy to undo the damage. At the same time it mus be remembered that under that service the number o doctors and nurses working for local authorities wi be far smaller than at present, and the question o trade-union membership may scarcely arise. One of th merits of the scheme, compared with some of its predeces sors, is that it goes a very long way to take the medica services out of municipal politics.

Special Articles

WORK FOR THE DISABLED

THE scheme for the reablement and settlement of the disabled has benefited greatly by the appointment of the standing committee, under the chairmanship of Mr. H. H. Wiles, to coördinate the work of the responsible departments. They have now reported[1] on the progress of their work up to date, and it makes heartening reading.

The numbers of hospitals in England and Wales offering active reablement have increased from 150 in 1943 to 333 in 1946—thus amounting to nearly 65% of the 520 hospitals selected in 1943 by officers of the Ministry of Health as fitted to develop reablement departments.

In Scotland during the war reablement was concentrated largely in emergency hospitals run by the Department of Health, and in the hutted annexes run by local authorities as part of the Emergency Hospital Scheme. These contain the special units—for neurosurgery, plastic and orthopædic surgery, and so on—set up under the scheme; reablement departments have been developed according to the needs of each institution. At Gleneagles the fitness centre established for miners now accepts any male civilian. The Department of Health is assessing the present reablement facilities in Scotland, and finding out at which hospitals they might be developed in future.

HEART AND LUNG CASES

The London County Council have agreed to start an experimental scheme at the Northern Hospital, Winchmore Hill, for cardiac patients between the ages of 18 and 25, but, owing to staffing difficulties, have not yet been able to set up a centre. More progress has been made on behalf of tuberculous patients: in 1943 memoranda on examination, diagnosis, treatment, and welfare were sent to local tuberculosis authorities; and maintenance allowances are now made to patients during treatment, and paid back to the authority by the Exchequer. The local offices of the Ministry of Labour are collaborating with the tuberculosis authorities in finding work under suitable conditions for patients as soon as they are fit to undertake it. It has proved easier to find part-time work for them than to provide reablement centres, but work in sheltered surroundings is being specially considered.

THE HARD OF HEARING

For the partially deaf a new and efficient hearing-aid has been designed by the electro-acoustics committee of the Medical Research Council. Under the new health service, treatment for deafness, scientific assessment of the need for this hearing-aid, and the aid itself, with service and new batteries, will all be provided. Possibly the aids themselves may be made in factories for the disabled.

THE MENTALLY ILL

Patients with psychiatric disorders are perhaps the hardest of any to settle in work. Two experimental assessment centres—one in England, one in Scotland—are to be set up where patients will be studied and recommended for the most appropriate form of reablement. They will be run on the lines of the Dartford centre set up to help returned prisoners-of-war. In addition, new reablement centres will be established by the Ministry of Labour for people developing neuroses in industry; these will occupy the civil resettlement units taken over from the Forces. Those with mild troubles, including some who have passed through the centres described, will be helped to return to ordinary work, while the more seriously affected will be given work under sheltered conditions, either by the Disabled Persons Employment Corporation or by voluntary bodies, such as the Ex-Services Welfare Society. For those who cannot be resettled in any of these ways new plans will have to be devised; but in the meantime it will be possible to learn much about their numbers and their needs.

MINERS AND DOCKERS

Apart from the Gleneagles Fitness Centre, special factories for miners with silicosis and pneumoconiosis are planned. Merseyside and Manchester dock-workers suffering from minor physical ailments can nowadays get medical advice and be referred for treatment under an experimental scheme, and the committee feel that the development of similar schemes would be useful. They have also studied the Scottish Supplementary Medical Service, which helps general practitioners by providing complete consultant and diagnostic facilities for early cases of organic disease. This scheme, originally limited to the Clyde Basin and to people under 25, has now been extended to people of all ages in every industrial area of Scotland, and is fully supported by doctors.

STAFF TRAINING COURSES

It is thought that the time is not yet ripe for founding a postgraduate diploma in reablement, but some special courses have been held and over 250 doctors have attended them. A new course of training, lasting a year, has been arranged by the Institute of Hospital Almoners, and eligible ex-Service candidates are offered financial help towards taking this. Some 150 physical-training instructors from the Forces are being trained as remedial gymnasts with the help of the Ling Institute.

OPENINGS FOR THE DISABLED

Artificial limbs are still being supplied either free or on a cost-recovery basis to all who need them, and the employment of people with artificial limbs is being encouraged by the Ministries of Labour and Pensions. Under the new Act, artificial limbs are to be provided as a part of the health service. The appointment of disablement resettlement officers (D.R.O.s) was at first not wholly successful because there were no candidates with experience of the special duties required of them. Better training courses are now provided.

Vocational training may be provided under the Act for all disabled people over 16 who need it, and a wide range of occupations and trades are covered, including agriculture, civil engineering, and such divers callings as bootmaking, diamond-polishing, commercial art, pottery, hairdressing, piano-making, watch-mending, spray painting, and many others. Great efforts are made to meet individual requests for forms of training not on the list. The number to be trained is agreed with representatives of the industry, who also ensure that those reaching a given standard of training will be found skilled jobs. Some important industries, however, such as engineering, furniture-making, and printing, can only accept small numbers.

Training for technical and professional occupations is also offered. Up to August 31 of this year 3000 people discharged from the Forces for medical reasons had been given awards under the Further Education and Training Scheme, and applications from another 500 were being considered.

At the residential Industrial Rehabilitation Centre at Egham 200 men can be received at a time. They stay 1–3 months, receiving free board and lodging and a maintenance allowance while they are made fit for work or vocational training. Some Army civil resettlement units are to be taken over by the Ministry of Labour and used for the same purpose. The new centres will not exclude people who have been suffering from neurosis, and at least one will accept women.

In order to be eligible for resettlement under the scheme, the patient must put his name on the register of disabled persons maintained at the local offices of the Ministry of Labour. As a result of the growth of the register, and the existence of unemployed disabled, the Minister of Labour decided to raise the quota of disabled persons to be employed in industry from 2% to 3% on Sept. 1, and the possibility of a further increase is being kept in mind. The two employments of passenger electric-lift attendant and car-park attendant have been designated as specially suited for the disabled, which means that future openings in these occupations will be reserved for them.

The Act gives the Ministry of Labour statutory authority to provide sheltered conditions for those who need them, and in fact for some years the Ministry has

---

1. Report of the Standing Committee on the Rehabilitation and Resettlement of Disabled Persons. H.M. Stationery Office. Pp. 2[illegible]. 4d.

PHASE-CONTRAST MICROSCOPY

OBSERVATION of the living cell by transmitted light has been a difficult task, for the refractive indices of the unstained components vary only slightly, and the thickness of a single cell is insufficient to make minor variations observable. Dark-ground illumination is a useful supplementary technique, and intravital staining has yielded further information. Ultraviolet microscopy requires special apparatus and the irradiation kills most tissues fairly rapidly, while the interpretation of observations made on the classical stained section is suspect, for one cannot eliminate the possibility that artefacts are produced by the staining technique. Electron microscopy is still for the few. The phase-contrast technique, first suggested ten years ago, was demonstrated to a meeting of the optical group of the *Physical Society* on Nov. 22. This brings to a successful conclusion the work of Mr. C. R. Burch, PH.D., F.R.S., and his colleagues at Bristol, who have long championed the idea and at this meeting presented a mathematical analysis of the principles involved.

The phase-contrast technique employs a system for retarding part of the beam incident on the microscope condenser; this is modified in passing through the specimen, and the emergent beam collected by the objective passes through another retard plate placed accurately over the first. The effect is to accentuate by interference the minor differences in phase introduced by the tissue, and so to render visible changes in optical density imperceptible by normal observation. Mr. A. W. Hughes, PH.D., spoke of the tremendous progress now possible in cytological studies, and showed two films made at the Strangeways Laboratories with a home-made simplification of the equipment. This development has also been studied in Germany, and a few examples of the Zeiss equipment are in England. Two speakers remarked that the recently developed British equipment is superior to the German. Old prejudices die hard, but it is time that the old wives' tale that English microscopes are not as good as Continental was discarded.

THE DISPUTE

IT is difficult to write temperately of the decision of certain local authorities to discharge anybody in their service who refuses to join a trade union. Yet presumably this decision seems to them entirely reasonable. "It is generally accepted," says the *Encyclopædia Britannica*, "that the conduct of industrial negotiations in Great Britain must be on the basis of negotiations between organised workers and organised employers," and during the war of 1914–18 the Government themselves, and many employers, encouraged workers in the larger industries to join a union. In big organisations it is obviously more convenient that terms of service should be agreed with the whole body of workers rather than with individuals separately, and there must be a mechanism for appointing plenipotentiary representatives. To a considerable proportion of the people of this country it has become an article of faith that the decent man joins a union so as to stand by his comrades; and those who refuse to join one incur scorn because they stand aside yet profit by the union's efforts—less being said about their suffering through union action of which they may disapprove. When he is elected to the control of a municipal service, the trade unionist naturally thinks of it as a rather untidy industry which needs to be set in order, and related to other industries, by giving everyone trade-union status as a worker with appropriate representation. Unfortunately, to achieve so desirable an end he sometimes holds it permissible to use compulsion —employing the direct action which has won the unions so many victories, and so many members, in the past.

There is no need to repeat here the arguments agains this variety of compulsion: the indignation aroused b its application in a new field by the local councils ha been vigorously expressed by many newspapers. We fee bound to add, however, that, rightly or wrongly, salarie members of the medical and nursing professions do no regard themselves as "employees"; when a docto works for a council his primary duty is still towards hi patient, and his relation towards the council is not th relation of "master and man" which obtains in industr and which forms the basis of trade-union organisatio It is true of course that the professional status cherishe by doctors and nurses may have elements of snobber (as a correspondent argued in our last issue), but wha is much more important is that it provides standard and incentives of high social value, which more than eve need preserving now that the financial prizes of succes are diminishing. To outsiders at least, it has seemed that whatever else they may have done, trade unions have seldom inspired their members to work without regard for time or place or anything but the end in view. We doctors require such inspiration; and, until we are offered something better, we shall continue to wea our professional uniform, because it helps to kee us up to the mark and still attracts likely lads t our ranks.

We shall be told perhaps that this is quite irrelevant; that nobody thinks of challenging professional status; and that for doctors, dentists, and nurses membership of a trade union is demanded merely as a matter of administrative convenience. Of this it will be easier to judge when we know precisely how the councils define "trade union"—whether strictly as a union affiliated with the Trades Union Congress or loosely as any body representing workers. In recent legislation Parliament has not apparently favoured a "closed shop" in any narrow sense; for example, the Coal Board are instructed to consult with "organisations appearing to them to represent substantial proportions of the persons in the employment of the Board, or of any class of such persons." If the local councils want to find organisations representing substantial proportions of the doctors in their employment they need go no further than the British Medical Association and the Society of Medical Officers of Health, which, though not trade unions, are recognised by the Government and the public as competent to represent doctors on questions of service. If the councils confine themselves to asking that doctors and nurses taking their appointments shall belong to an organisation capable of representing them we shall have to admit that they have a case worth considering. But in a reasonable society, such as we are trying to build, such proposals ought to be put forward in the first place for discussion rather than for compliance. The terms of service of doctors working for local authorities are largely the result of agreement on the national level between all the interested parties, and in our view no big change ought to be imposed locally by individual councils following their own ideas. We believe in fact that local authorities, like workers, should act through the associations formed to represent them.

The independent action of the councils has increased the difficulties of moderate men. Apart from its possible effect on the recruitment of nurses, it has provided a bonus for those who oppose the Government's plans for a National Health Service, and Mr. Bevan may not find it easy to undo the damage. At the same time it must be remembered that under that service the number of doctors and nurses working for local authorities will be far smaller than at present, and the question of trade-union membership may scarcely arise. One of the merits of the scheme, compared with some of its predecessors, is that it goes a very long way to take the medical services out of munic the council in May, 1944, after dismissal from the R.A.M.C. by court-martial for drunkenness, and after conviction by a police-court of driving a motor-car under the influence of drink. The council then postponed judgment for a year. In May and July, 1945, the council decided that it would have been prejudicial to the health of Dr. Robertson for him to attend, and in November, 1945, when he appeared, the council again postponed judgment for twelve months. Dr. Robertson now appeared, and Mr. S. Winterbotham, of Messrs. Waterhouse and Co., solicitors to the council, read a statement by him that he had been in Bethlem Hospital as a patient and had been unable to obtain employment. The President asked him whether he was at the moment under the influence of alcohol; this he denied, saying that he had last taken alcohol in August. The council directed the registrar to erase his name from the Medical Register.

DRUNKENNESS: JUDGMENT POSTPONED

William Francis Hirsch Coulthard, registered as of Balwinnam, Aspatria, Carlisle, M.B. Edin. (1927), appeared before the council accompanied by Mr. H. G. Peacock, ounsel, instructed by Messrs. Le Brasseur and Oakley, olicitors, for the London and Counties Medical Protection Society. The council found that he had twice in the present year been convicted before petty sessions of drunkenness, on one of these occasions in charge of a motor-car; that under the influence of drink he had used obscene language and assaulted a patient; and hat he had twice in the present year requisitioned four ampoules of 'Myocrisin' at the expense of the Cumberand County Council by falsely representing that it would be administered to a patient, whereas none of it was administered to her. Mr. Gerald Howard, counsel, prosecuted, instructed by the council's solicitors. Counsel for Dr. Coulthard admitted that the offences had all been due to excessive drinking but maintained that he doctor had since the last conviction been a total abstainer and intended to remain so. Dr. Coulthard confirmed this resolve in evidence. He said that he had n fact been treating the last patient with myocrisin for four years, and that after she had ceased to be his patient he had inadvertently continued to sign requisition forms. He had not used the supplies.

The President announced that in view of Dr. Coulthard's assurances of abstinence the council would postpone udgment for two years.

Reuben Denny, registered as of 64, Twyford Avenue, Acton, London, W.3, L.R.C.P.E. (1929), had been convicted in May, 1946, at Marlborough Street, of driving a motor-car under the influence of drink. He admitted an earlier charge in 1938, for which he had appeared before the council. He said he had not been practising at the time of the recent charge; his health had broken down owing to head injuries, for which he had been sent home from Gibraltar. The council postponed judgment for one year.

Mrs. *Ethel Grundy Toward*, registered as of Brookside, Durham Road, Birtley, Co. Durham, M.B. Durh. (1925), appeared after two convictions before the Gateshead magistrates, one in September, 1945, and the other in February, 1946, of driving a motor-car under the influence of drink. She was accompanied by Mr. Peacock, instructed by the solicitors of the London and Counties Medical Protection Society. She said that she practised in partnership with her husband and had succumbed to alcoholism through overwork, as she had had to run the house in addition to her practice. She had been successfully treated in a home. In the belief that her present appearance would be a warning to her, the council decided that her name should not be erased.

CASES ADJOURNED FROM PREVIOUS SESSIONS

Anthony John Watkin, registered as of 11, Woodville Road, Newport, Mon, B.M. Oxfd (1943), had been convicted of attempted abortion and bound over. In November, 1944, the council postponed judgment. He now appeared and presented testimonials. The council decided not to order the erasure of his name.

John Corboy, registered as of Freshfield, Lon Dervis, Tycoch, Swansea, M.B. N.U.I. (1939), had been twice convicted in 1945 of being drunk in charge of a motor-car. Last November the council postponed judgment for one year. In view of satisfactory evidence of his character and conduct the council decided not to order the erasure of his name.

William Allan, registered as of 31, Hill Crest, Burnley Road, Sowerby Bridge, Yorks, M.B. Glasg. (1920), had been imprisoned for three months for obtaining £5 by false pretences. In February this year the President announced that the conviction had been proved to the council's satisfaction, and added that from the council's point of view Dr. Allan's record, both as regards his financial dealings and drink, was not satisfactory. The council postponed judgment for two years but desired to see him at intervals during that period. Dr. Allan now appeared and produced testimonials. He admitted that he took a drink on odd occasions but was deriving benefit from psychotherapy. The President said that the council desired to see him again at its session in May, and hoped that he would then produce better evidence of his character and conduct.

British Pharmacopœia

Prof. DAVID CAMPBELL, presenting the report of the Pharmacopœia Committee and Commission, said that the whole text of the new *British Pharmacopœia* had been sent to the printers and a part had been returned in proof. While, however, the commission recognised the desirability of producing a new and complete pharmacopœia as soon as possible so as to relieve pharmacists and manufacturers of the necessity of consulting numerous addenda, it regretted that it could not yet suggest a date for the appearance of the new edition.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED NOV. 23

Notifications.—Smallpox, 0; scarlet fever, 1402; whooping-cough, 1773; diphtheria, 319; paratyphoid, 20; typhoid, 3; measles (excluding rubella), 5428; pneumonia (primary or influenzal), 708; cerebrospinal fever, 43; poliomyelitis, 16; polioencephalitis, 0; encephalitis lethargica, 2; dysentery, 69; puerperal pyrexia, 124; ophthalmia neonatorum, 61. No case of cholera, plague, or typhus was notified during the week.

The number of Service and civilian sick in the Infectious Hospitals of the London County Council on Nov. 20 was 959. During the previous week the following cases were admitted: scarlet fever, 46; diphtheria, 19; measles, 16; whooping-cough, 27.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from an enteric fever, 1 (0) from measles, 11 (0) from whooping-cough, 5 (0) from diphtheria, 64 (10) from diarrhœa and enteritis under two years, and 18 (3) from influenza. The figures in parentheses are those for London itself.

Sheffield reported the fatal case of an enteric fever. Liverpool had 4 deaths from whooping-cough. There were 11 deaths from diarrhœa and enteritis at Liverpool and 8 at Manchester.

The number of stillbirths notified during the week was 294 (corresponding to a rate of 32 per thousand total births), including 38 in London.

On Active Service

AWARDS

THE following awards have been made for gallant and distinguished service while engaged in special operations in South East Asia.

M.B.E.

Major J. G. DUMOULIN, M.B. Lond., R.A.M.C.
Captain E. J. HARRISON, M.B. Camb., R.A.M.C.
Major ARRON RAPOPORT, L.R.C.P.E., R.A.M.C.

CASUALTY

DIED

Captain JAMES WALSH LILLICO, M.R.C.S., I.M.S.

The death is announced of Captain Lillico, in October, 1942, while a prisoner-of-war in Japanese hands. After taking the Conjoint qualification in 1937 he joined the Indian Medical Service. He leaves a widow and a son.

assisted some voluntary bodies in work of this kind—notably the Lord Roberts Memorial Workshops. Local authorities will continue to be responsible for the blind, but the Ministry will help the workshops financially. In Scotland the Ministry will take over the responsibility for training in workshops of all blind people over the age of 18.

The Disabled Persons Employment Corporation Ltd., under the chairmanship of Viscount Portal, will develop employment facilities for the severely disabled wherever there is need of them. A programme of 50 factories, to be called "Remploy Factories," for this purpose has been approved, and the first three of these factories are now in action. People pensionably disabled as a result of service in the recent war may be helped to set up in work on their own account if this is considered the best form of resettlement for them.

Two hostels for paraplegics, each catering for 50–70 people, are to be built, one in the London, and one in the Glasgow, area. Meanwhile the Ministry of Pensions has opened convalescent wards at Stoke Mandeville Hospital, where prevocational training is offered. A settlement for these patients is being established at Lyme Green Hall by the joint committee for Cheshire of the British Red Cross and Order of St. John, and the British Legion is undertaking to adapt the patients' homes to their needs. "They are for the town's end, to beg during life," said Falstaff of the old soldiers. Here at least we can admit to a little progress.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

DISCUSSION OF THE ACT

THE position which has arisen from the enactment of the National Health Service Bill was discussed at a meeting of fellows on Nov. 29. Sir **ALFRED WEBB-JOHNSON**, the president, said that the college's representatives had done their best to consider the National Health Service in a non-political way; the freedom of the profession was regarded not as a vested interest of the profession but as guaranteeing the freedom of individuals to be served as they pleased. The college had supported the Negotiating Committee because it represented the whole profession: in such a question as this the whole profession should stand together, and the college should support the general practitioner. Despite representations, several important principles to which objection was taken had not been removed from the statute. Ownership of practices might seem a guarantee of independence and devoted service, yet their sale and purchase was to be prohibited. But here opinion was divided, and the point was perhaps not worthy of the important category in which it had been placed; it might possibly be settled by negotiation. In the restriction on the place where the general practitioner might work, the only concession had been that the decision should rest with general practitioners already employed in the area. Other objectionable features were the proposed tribunals with no appeal beyond the Minister, and the threat of part-payment by salary. But "I do not find in any of these items sufficient grounds for refusing to discuss the implementation of the Act with the Minister." The most undesirable of them was the salary element, which might interfere with the doctor-patient relationship.

For specialists, the Act created a monopoly of hospital services; but by negotiation it might be possible to get regulations framed so as to leave the profession as free as it is now. The council agreed that in a large proportion of hospital pay-blocks charges should be controlled; but in some part there must be a free relationship between doctor and patient. The powers given to the Minister might impede private venture; he could, for example, take over a private clinic. What was important was to preserve independent practice. Considerable concessions had been won; and further concessions, the President believed, might be obtained in framing the regulations. The council as a body favoured the profession's support in this work; it was for individuals to make up their own minds.

Mr. **WILFRID ADAMS** said that the Act was ill-founded because the profession had not been invited to lay down the form of the new service.

Mr. **LAWRENCE ABEL** agreed that there must be a medical service for all. But he was opposed to negotiation over regulations, because the Socialist Party's declared aim was a whole-time salaried service. The patient's main safeguard, he suggested, lay in the doctor having bought his share in a practice. The Act allowed for consultation with the profession, but the profession's advice would not necessarily be accepted. The most important item was the State-ownership of hospitals, by which a monopoly would be created. By a slight amending Act the service could be founded on rock.

Mr. **W. ETHERINGTON-WILSON** said that the feeling was growing among general practitioners that the people most likely to let the profession down were the consultants and specialists. Shackles, dictatorship, or direction must sooner or later appear whatever the Minister said now.

Mr. **REGINALD PAYNE** was opposed to this fresh example of delegated legislation, and monopoly without the right to dissent. The student was to be rendered servile, mobile, and docile. In ten years half the council would be civil servants and the other half Government pensioners. He saw the National Health Service as a whip in the hand of the executive.

Mr. **J. S. HORN** said that points of principle should not be confused with points of expediency. No mention had been made at the meeting of doctors' economic position under the Act, since that would be an admission tha some of the opposition was based on self-interest. Th Act should be seen as a democratic measure put forwar as the result of a general election at which the plan ha been laid before the electorate.

Mr. **A. DICKSON WRIGHT** held that a free choice o hospitals is as important as a free choice of genera practitioners; there was nothing wrong with the volun tary hospitals or their finances. Where commercia organisations were nationalised, dissident elements coul be condemned to prison or the peerage; here the Govern ment had to deal with no board of directors, and al that doctors needed to say was that they were not goin to work the Act.

Mr. **SANGSTER SIMMONDS** said that the nature of the service would depend on how doctors did their work: voluntary hospitals had been successful because doctors had worked well. Most of the criticisms had been against points to be settled by regulation, and further improvements might be obtained if the profession negotiated.

A motion regretting the council's decision in favour of discussing regulations (see p. 854) was not voted on. The meeting agreed, without a formal motion, that the main body of the profession should be supported in its decision by the college.

GENERAL MEDICAL COUNCIL

WINTER SESSION, NOV. 26—28

AFTER the President's address, reported last week, Dr. **ROBERT WILLIAM CRAIG** was introduced as direct representative for Scotland.

The names of *James Jackson Brown*, *Erich Hohenberg*, *Arthur Patrick Kennedy*, *Matthew Morgan-Daley*, *Brendan O'Carroll*, and *Archibald Walker* were restored to the Medical Register, and the names of *Harry Ernest Best* and *Alfred Horace Myring* to the Dentists Register.

Penal Cases

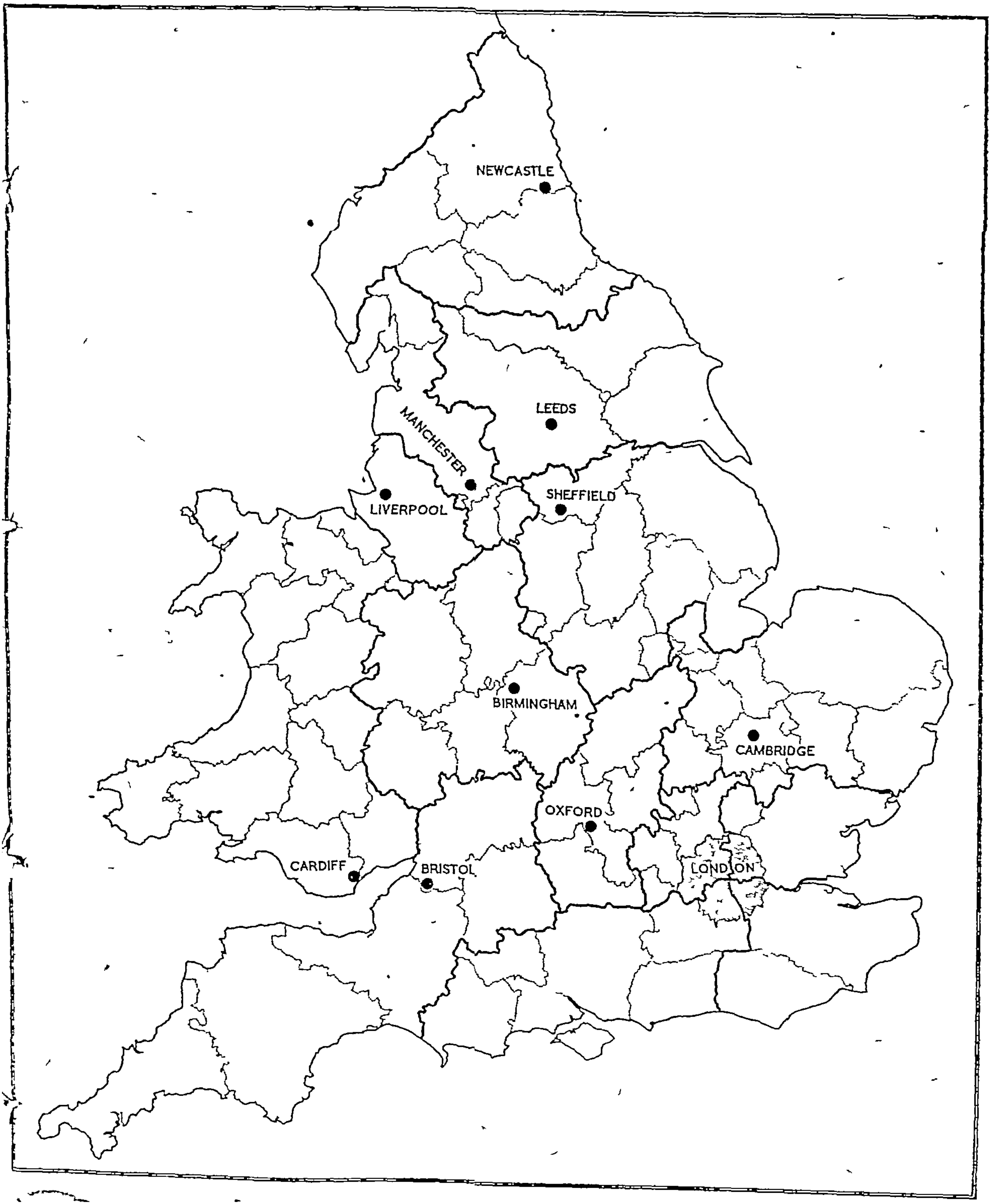
On the recommendation of the Dental Board, the council ordered the erasure from the Dentists Register of the name of *Ascott William Harris*, registered as of 29, John Bright Street, Birmingham, 1 (Dentists Act, 1921), for associating in practice with an unregistered person who advertised in Birmingham newspapers a hospital for broken dentures; and the name of *George William Southwood Clark*, registered as of 94, West Street, Gateshead, 8 (Dentists Act, 1921), who had been sentenced to hard labour at Northumberland quarter sessions for breaking and entering a house and stealing goods. Mr. Clark had written a letter to the council stating that he had practised as a dentist for forty years and was entirely innocent of the offence.

ERASURE FROM THE MEDICAL REGISTER

Graham George Robertson, registered as of 25, Mariners Lane, Tynemouth, M.B. Edin (1934), had appeared before course be accessible as at present to the inhabitants of other regions, and its university influence could be exercised on these regions as effectively perhaps as under the Government scheme: the University of London would be represented on their boards, and two or more teaching hospitals would adopt each of them.

SENTIMENT ?

These are some of the questions raised by the Minister's proposals, on which he invites comment by Dec. 15. Local authorities with large hospital services which will be divided or fragmented by the proposed boundaries may feel that too much emphasis has been placed on the potential rôle of the universities, and too little on the maintenance of going concerns. Again, those who want to see the universities and medical schools in a key position will not necessarily be convinced that the key position must be geographically inside the region—nor that London is the only university capable of interesting itself in more than one region.



Reconstruction

THE MINISTER'S REGIONS

SOME CRITICISMS AND ALTERNATIVES

FORMERLY it was intended that for hospital purposes England and Wales should be divided into about 30 regions. The white-paper issued when the National Health Service Bill was introduced spoke of 16–20. But in the Government's draft scheme (summarised in our last issue and illustrated in the accompanying maps) the number is reduced to 14. Of these, 4 are so big that they will have to be subdivided, the regional board delegating many of its functions to a committee responsible for part of its area.

In coming down on the side of large regions the Ministry of Health has gone far to meet the "voluntary hospitals" view. On the face of it, the bigger the region which a hospital board covers, the less likely it is to attempt detailed control of individual institutions, and the more it will leave to the hospital management committees. The function of the boards, as the Minister now sees them, is the planning, coördination, and provision of hospital and specialist services rather than the control and management of hospitals, and his plan suggests that the management committees are to have the responsibility and powers they need to attract able men and women to their work.

There are some, however, who, remembering the difficulty of coördinating the activities of voluntary hospitals, fear that any high degree of autonomy for the management committees will prevent the regional board from organising a coherent hospital service. Such a service, they believe, demands more than regional planning and regional coördination : to be effective the board must be able to close, amalgamate, and expand hospitals, to build new ones, to apportion funds, to arrange the bulk purchase of supplies, and to control staff appointments and discipline. They say that if boards are too weak, and management committees too strong, the anarchy of the old voluntary system will begin all over again.

The case for having 30 or more regions, with relatively strong boards, was set out by a *Times* special correspondent on July 12.

> "However regarded," he said, "a regional hospital service will be a large undertaking, especially since it is to be directed by a board of part-time and unpaid members, all of whom will have many other duties to occupy their time, including earning their daily bread. If they are to take their hospital board duties seriously, occasional meetings of the full board will not suffice. Much of the work will have to be done through committees, of which at least five—for finance, staff, planning and general purposes, supplies and equipment, and establishment or building—appear to be necessary: and some of these committees will undoubtedly require subcommittees for special subjects, such as mental health services, tuberculosis, and radiotherapy.
>
> "The larger the regions the heavier will be the burden falling on each board, and the greater the time spent by its members on travelling to meetings."

Excessive strain on the members of the board would, he thought, prevent the development of a human and personal service: so far from promoting self-government by the hospitals it might lead to stifling of local initiative through excess of rules and regulations. However this may be, it is clear that infrequent meetings of the board and small attendance at its committees would mean that much of the work would be left to the chairman and the paid staff, and this might favour bureaucratic technique.

Finally objection is raised to the Minister's scheme on the ground that his 14 regions do not take enough account of "natural hospital areas" but are based primarily on the geographical situation of the universities. Their design starts from the assumption that every region must have a university within its borders; and not all the universities happen to be conveniently situated.

UNIVERSITY AND REGION

The choice of a university town as the capital of each region is to many people one of the most attractive features of the scheme. Admittedly the universities and their medical schools have hitherto had little to do with some of the most important parts of the hospital services, such as the provision for infectious diseases, mental disorder, or the chronic sick; and it would of course be a mistake to give them a predominance that would drive out valuable experience of such work. Nevertheless it is easy to see that in the new hospital and specialist services the universities might make the vital difference between mediocrity and excellence, not only because they can insist on scientific and professional standards but because they can offer the incentive o academic status to hospitals and staffs which study to deserve it.

In the *Times* of July 15 Lord Moran pointed out that in future provision must be made for postgraduate teaching for "the whole profession in relays," and this must be undertaken by hospitals not as yet seriously concerned with teaching.

> "The particular task of the universities," he said, "would be to see that hospitals in the regions which have been chosen to teach post-graduates are qualified to do so by the competence of their staff and by the nature of their equipment. Each university must demand that every teacher in its region is recognised and approved by its medical faculty, just as all those who now teach in the 12 medical schools of London have to apply to the London University for recognition. In that fashion the faculty will ultimately be largely responsible for the quality of the staffs and in consequence for the efficiency of all sizeable hospitals outside the special 'teaching group.'"

But even those most anxious to promote university influence in the regions do not all accept this as an argument for having only about 14 regions, each with a university inside it. If there were 30 regions it would be possible for each university to adopt two or more in its neighbourhood; for it is not essential that the university should be geographically within the region it is to influence.

This particular argument has been put forward cogently in relation to London.

LONDON

In the Ministry's scheme, London is divided into four parts which form the proximal ends of four large regions, one of which stretches to Portland Bill. The division has been made in such a way that each part contains at least two of the dozen undergraduate medical schools at present existing in the metropolis. All four regions will have the advantage of a share in the many important medical institutions of London, whose hospital service is far better developed than that of most of the home counties, and the inhabitants of distal areas will stand to gain immediately by sharing equally with Londoners. On the other hand, it may be argued that in each case the London end of the region will be the *tail* which wags the dog, and the effect of this will be to prevent the development of self-sufficient hospital services which the peripheral areas could and should build up. How big a part will Canterbury, Brighton, and Maidstone really play in the affairs of a region that includes a quarter of London ?

An alternative scheme which has found some support is that London itself, which has historic and functional unity, should not be artificially cut in pieces but should form a region of its own. Its hospital beds would of

In England Now

A Running Commentary by Peripatetic Correspondents

DOWN here in Brighton we have been having a pre-view of a play dealing with the keen young doctor and his imaginary frustrations by the State Medical Service. Written by Warren Chetham Strode, author of *The Guineapig*, it is called *The Gleam*, though possibly *The Glow-worm* might have more aptly described the mentally conflicted hero, poor "Dr. Alan Boyd, F.R.C.S." Boyd is a young G.P., so we will not cavil at his courtesy title. If some may feel a trifle uncomfortable during his oration on our Vocation ("hands off healing," &c.) it does not spoil the evening's fun, and one is relieved that he had this psychological catharsis; it must have expelled many vapours—which we had noticed with sympathy.

The play goes to London this week. Meanwhile my own views, if I may express them without presumption, are:

(1) That "vocation" applies to firemen much more than to the senior G.P., who usually, though not by any means always, is very cosy and uses his own shining conveyance which he does not have to clean himself.

(2) That the *lay* members of committees and boards are much more frightened of doctors than we are of them. Whereas, on the other hand, the medical members can be quite dangerous and oppressive.

The type I most fear is the retired army A.D.M.S. equipped with a Diploma in Medical Administration and Social Coöperation. This is the bird who will make young Tim Cartwright afraid to open his official correspondence. The problem of the medical repercussive punitive poster, armed with higher authority, should now, in good time before appointments are made, be treated as urgent.

* * *

I find all this chat about the conservative treatment of perforated ulcer most interesting. Having read the original articles and the subsequent correspondence and resisted the temptation of writing myself to describe the case I once had when, three days after the calculated perforation, I was able to elicit a hitherto unrecorded physical sign—namely, shifting resonance in the peritoneal cavity, owing to the escaped gas which had not then been reabsorbed: having got as far as that, my next course was clearly to await the advent of the Right Case.

Yesterday he arrived. Forty-five, three years' dyspepsia, two hours perforated, nothing to eat since the night before, and (to discourage the narcologist) rather a poor chest. All the physical signs were there except absent liver dullness and after all it was early days for that. Two other colleagues agreed that no better case could be found—and at that exact moment my Guardian Angel gave me a prod in the ribs and told me I had better open him up. After I had removed the gangrenous appendix I said to him (my Angel, that is) shall I write to THE LANCET about this? If you do, said he, someone will only write back and say, "Well of course if the poor fool can't diagnose an appendix . . ." So that's how the matter rests. The other chaps can work out the statistics and explain things to the Coroner from time to time. Like Lord Vansittart I can say with feeling: "Never again."

* * *

I called on a very deaf lady one day. At the top of my voice I tried to persuade her that I was not looking for lodgings, but we made no progress. Then with a flash of inspiration I placed my stethoscope in my ears and was relieved to see understanding dawn in her eyes. "Ah, that's bad," she said. "Be you as deaf as I?"

* * *

An extract from a recent speech:

"I look forward to the time when some party in power, or perhaps some party seeking office, becomes gravely concerned about the spiritual health of the nation, and devises a comprehensive scheme of salvation at ninepence a week for men and sevenpence for women and children. With free choice of parson. . . .

"The clerical profession will be expected, indeed will be instructed, to prevent sin; and if any member fail to bring a sinner to repentance within a reasonable time—say three months—an inspector will be sent along to look into the case. . . .

"Much of the clergyman's time will be spent in making returns, rendering reports, issuing certificates of pardons and indulgences, and filling up the counterfoils. He will in fact once again become a clerk in Holy Orders, but controlled by a layman, who in a previous government was Postmaster-General or Agriculture and Fisheries together with his whacking big administration in Whitehall. . . .

"I say I am looking forward to this, but I am afraid that it is only a fantasy. Somehow I don't think the churches would allow it to come to pass."

* * *

The Medical Exhibition—not perhaps in its old glory, but nevertheless itself, with its free literature, its gentlemanly barkers, among whom the profession go about seedily, trying not to look shamefast at the bulging of their pockets with pharmaceutical baksheesh, its striking similarity to the pre-war Schoolboys' Exhibition, where small boys goggled at the interior of radio sets and guns exactly as we goggle at electrocardiographs and shock-boxes.

Like the B.B.C., it has its three intellectual levels. The highbrows converse with the experienced technicians of Messrs. X and Y or ask awkward questions about one-sweep time-bases and square waves (what fun the radar pundits can have at the expense of the uninitiated—before the war few could rag the oscillograph-makers on their own subject); the middlebrows study bags and baby food; the lowbrows go in for silver pills and polypharmacy. And all of them surreptitiously collect samples. So did I, apologetically. "You shouldn't worry," said the barker, "one of 'em's brought a ruddy great portmanteau." Then there is a certain palatable laxative, which incidentally makes a marvellous cake-decoration. I was sorry for the lonely little woman demonstrating surgical belts, to whom nobody talked. How she must have wished for one of the oscillographs, to show how your belly goes in and out when you wear them!

I do not know where our pharmaceutical colleagues recruit their barkers; it's a hazardous life. They have no means of knowing if the little man who is trying to viva them is a student or a regius professor. The first few answers you get are always ranging-shots, yet only one of the salesmen examined by me would have failed, and only he because he told me that a pill, made largely of œstrogens, would be suitable for children under five. The oscillographers let you twiddle their knobs with an air of deference and one hand ready to make a grab if you look like blowing out the tube. The samples, too—some are bottles of 100, others, pretty enough for a doll's house, have the label arranged so that you can't count the pills; the sternest merchants put three chaste tablets in a little 'Cellophane' bag, and if you don't like it you can leave it. I often wonder what people do with them. I know one colleague who makes toy chemists' shops for his nephews. In any case, it is unwise to go without a poacher's pocket. Full of diabetic chocolate, and bulging with calves-foot jelly, I went home resolved to go next year, and assured that somebody at any rate will send me some parcels this Christmas.

* * *

F. D. R.

A statue in a London square? The choice
was made for those unborn—to come and stare
or "Roosevelt's statue? Yes, I'll meet you there."
For us who heard, for ever he's a voice
that pierced the black-out for a friendly chat—
so decent of him to drop in and show
the neighbours what he felt, what now they know—
a voice that told of tools and ships and dawn, and this
and that.

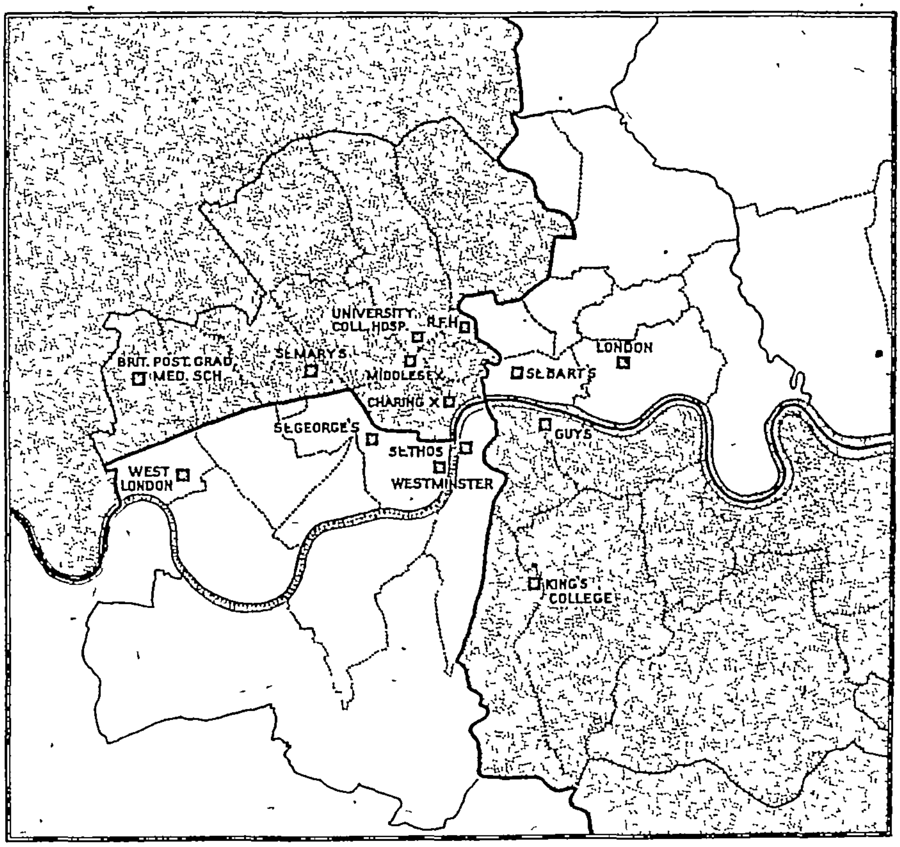
But will it show the wasted limb or shun
so sad a showing in a London square
with lapidary robes? Or shall men stare,
"D'you see the contrast? Yes? that's where one war
was won."

The advocates of smaller regions can point to the difficulty of giving life to a regional authority which is too remote to command local interest or evoke local patriotism. And in Wales at least they can point to a region where natural hospital areas have been ignored for extraneous and sentimental reasons.

Against these objections, which are undoubtedly valid, the Ministry can marshal arguments in favour of its plan. On the level of practical politics 14 boards present less difficulty, in appointment and staffing, than 30. On the level of intangibles there can be little doubt that the large region commanding whole attention of the university which served its intellectual capital would have more prestige personality than the small which shared with others attention of a university outside its borders. The smaller the region the more the probability that it will always be merely unit in a national service. Th larger the regions the more chanc we shall have of developing federation of regional medica services, each with a characte of its own and striving to prov its worth. This desira development would be favour if the regions chose individu names, such as Tyneland, Wesse and Westland, and if all th services coming under th regional board were called th Tyneland, Wessex, or Westlan Hospital Service.

With improving communications, local patriotism and interes may be expected to exten further, and might well attac themselves to a service whic explicitly belonged to the region, instead of being just part of an organisation as national as the Post Office.

But if local sentiment is important, what about London? Can it really be wise to begin by splitting the capital city arbitrarily into four zones?



NORTH-WESTERN REGION

Teaching

Charing Cross (300 beds)
Middlesex (602)
Royal Free (327)
St. Mary's (480)
University College Hospital (617)
British Postgraduate Medical School at Hammersmith L.C.C. Hospital

Voluntary

SS. John and Elizabeth (162)
Hampstead General (140)
Royal Northern (484)
National Temperance (158)
Italian Hospital (closed)
London Homœopathic (200)
French Hospital (70)

St. John's for Skin Diseases
Princess Louise (100)
St. Lukes (62)
West End Hospital for Nervous Disorders (70)
Western Ophthalmic (42)
Maida Vale (88)
Paddington Green (52)
London Lock (closed)
Samaritan Free (88)
Royal Westminster Ophthalmic (100)
Elizabeth Garrett Anderson (106)
Royal National Ear, Nose, and Throat (213)
Metropolitan Ear, Nose, and Throat (22)
Hospital for Tropical Diseases
Central London Ophthalmic (51)
Gt. Ormond Street (326)
Soho Square (81)
St. Peter's (39)
National Heart Hospital
Royal National Orthopædic
National, Queen Square (265)
Marie Curie (39)
London Fever (209)
Royal Dental
St. Paul's (33)

London County Council

Hammersmith (709)
St. Charles (760)
Paddington (668)
Highgate (545)
Archway (564)
St. Mary Islington (836)
St. Pancras (660)
New End (260)

Sheffield Street (102)
North-Western (410)
St. Margaret's (closed)

NORTH-EASTERN REGION

Teaching

St. Bartholomew's (785 beds)
London (891)

Voluntary

London Jewish (109)
Poplar (122)
German (224)
Metropolitan (150)

Queen Elizabeth Children's (376)
London Chest (190)
Royal Chest
Royal London Ophthalmic (200)
City of London Maternity (79)
St. Mark's (72)
Mother Hosp., Salv. Army (100)

London County Council

St. Clement's (397)
St. Andrew's (630)
Bethnal Green (650)
Mile End (568)
St. Peter's (395)
St. George-in-the-East (410)
St. Leonard's (549)
St. Matthew's (627)
Hackney (1310)

Eastern (621)

SOUTH-WESTERN REGION

Teaching

St. George's (436 beds)
St. Thomas's (583)
Westminster (405)
West London (239)

Voluntary

Royal Masonic (220)
Princess Beatrice (88)
Battersea (85)
Bolingbroke (135)
Putney (101)

Queen Charlotte's (87)
General Lying-in (50)
Chelsea Women's (120)
Grosvenor Women's (58)
Royal Waterloo (130)
South London (168)
Victoria Children's (138)
Belgrave Children's (70)
Infants (Westminster) (100)
Royal Cancer (156)
Brompton (150)
Royal Incurables' (250)
Queen Mary's Roehampton

Borough Maternity

Battersea
Wandsworth
Fulham

London County Council

St. John's (637)
St. James (898)
St. Benedict's (318)
St. Mary Abbots (832)
Fulham (716)
St. Luke's (390)
Lambeth (1250)
St. Stephen's (774)

Grove (616)
Western (517)
South-Western (363)
Tooting Bec (2355)
Fountain (680)

Middlesex County Council

Springfield (2032)

SOUTH-EASTERN REGION

Teaching

Guy's (692 beds)
King's (420)

Voluntary

Seamen's
Miller (172)
Blackheath (temp. closed)
St. John's, Lewisham (10
Woolwich (137)

Evelina (80)
South-Eastern Children's
All Saints (55)
Royal Eye (55)
British Incurables (100)

Borough Maternity

Deptford
Lewisham
Lambeth
Greenwich

London County Council

St. Olaves (688)
St. Alfeges (1107)
St. Giles (810)
St. Francis (645)
Dulwich (723)
Lewisham (781)
St. Nicholas (331)

Park (632)
South-Eastern (484)
Brook (1151)
Goldie Leigh (248)

Maudsley (235)
Grove Park (393)

rapidly fatal, the true diagnosis may be missed, unless a necropsy and elaborate hæmatological investigations are done.

A boy, aged 6 years, was admitted to hospital following a convulsive attack. He was very ill, pyrexial, and drowsy. The same evening his temperature rose to 105° F, while no satisfactory explanation could be found on clinical examination. In view of the seriousness of his condition, sulphapyridine was given. During the next few days blood-counts revealed a marked fall in the total of white blood cells, with granulopenia. On one occasion the white-cell count was 1140 per c.mm., with 400 granulocytes per c.mm. A tentative diagnosis of agranulocytosis due to sulphapyridine was made, and the child was treated accordingly. A blood-transfusion of four pints improved his condition so much that he was discharged home a month later, apparently cured. He was seen by me again about a year later for a swelling of the right testicle, and the unfortunate child was found to be suffering from lymphatic leukæmia. Death followed rapidly, and the diagnosis was confirmed by post-mortem examination.

St. Charles' Hospital, London, W.10. A. F. SUCHECKI.

GONORRHŒA IN THE FEMALE

SIR,—Dr. Neville Mascall (Nov. 16) has put forward a timely plea for care in the use of penicillin, and particularly for full and repeated tests after its administration for gonorrhœa in the female.

As he says, gonorrhœa in women is almost always complicated by the presence of other infecting organisms, and even the complete elimination of gonococci is not synonymous with "cure." It is therefore necessary that specific treatment with sulphonamides or penicillin should be supplemented—usually by some form of local treatment.

What advantages has penicillin to offer? At best it can render the patient non-infective in 12–24 hours; with sulphonamides, as usually given in an outpatient clinic, non-infectivity may be achieved in from 3 to 5 days. With sulphonamides there may thus be a lag of 4½ days, and it would be interesting to know what proportion of patients would be likely to risk infecting others during this time if they were told the diagnosis and its implications. With penicillin treatment observation must be continued for about six months, owing to the risk of its masking or delaying the early signs of coincident syphilis; and with the increased incidence of syphilis such double infections are more frequent now than in the years before the war.

A young married woman was treated with penicillin for gonorrhœa in pregnancy; after delivery sores developed and the Wassermann reaction became positive; the baby also was found to have a strongly positive Wassermann. Reinfection of the mother was virtually ruled out.

It needs very few cases of this sort to counterbalance the problematical gain to the public health of a few days' less infectivity by using penicillin. Up to now the success-rate of penicillin in acute gonorrhœa has been reported to be 90–100%; but if results similar to Dr. Mascall's are obtained by other authorities, then the scale will begin to come down heavily against this treatment.

Experience at the Royal Free Hospital clinic has proved that, with rigid methods of administration, failure to respond to sulphonamides is rare. Advantage is taken of the daily attendance for local treatment in the early stages to combat the incapacity of patients to take the necessary regular doses of sulphonamide. Each patient is given only one day's supply at a time, and each day emphasis is laid on the necessity for taking it according to the instructions on a simple typed slip. Penicillin is given only where the condition does not respond to sulphonamides, or in exceptional circumstances in adults; experience with penicillin in the treatment of gonococcal vulvovaginitis in children accords with that of Dr. Mascall.

In the older textbooks on venereal diseases the authors were often content to say of treatment in the female that it was carried out on the same lines as in the male. Perhaps the disappointing results with penicillin will emphasise that the condition is fundamentally different in the two sexes.

Royal Free Hospital, London. MARY MICHAEL-SHAW
Director, V.D. Clinic.

TREATMENT OF ANURIA

SIR,—With reference to the article by Mr. Reid and others (Nov. 23) the following case may be of interest.

A staff-sergeant fell out of a window in Beirut in November, 1945, sustaining multiple injuries including a simple fracture of the right femur at the junction of the middle and upper thirds. He was treated in a slung Thomas splint in abduction with skeletal traction by means of a Kirschner wire through the tibial tuberosity. Leaving Beirut that month I lost sight of this patient until January, 1946, when I encountered him again in Palestine. At that time there was neither clinical nor radiological evidence of any union whatsoever. He had fully recovered from his other injuries, which were comparatively trivial. The diagnosis of delayed union due to the interposition of soft parts was made.

His general condition appeared to be normal, and open reduction of the fracture and internal fixation was decided on. The operation was performed under general anæsthesia without a tourniquet. The diagnosis was confirmed and the fracture reduced and fixed internally by means of a Lane's plate and six screws. After skin closure and during the application of the plaster hip-spica the patient collapsed and it was decided to transfuse him with blood. He had lost quite an appreciable amount during the operation. Cross-agglutination tests were carried out and he was transfused with two pints of citrated group O4 blood. The first pint was run in rapidly and the second pint continued while he was recovering from the anæsthetic. His condition improved and everybody was satisfied until the next morning when it was noticed that both his conjunctivæ were deeply jaundiced.

The transfusion was immediately suspect and the two donors having been traced were recalled and further typings and cross-agglutination tests were carried out. These confirmed that both the donors were group O4 and that no agglutination took place with the recipient's blood. The blood when transfused was 14 days old and had been kept in a refrigerator. No sign of lysis to naked-eye tests had been reported by the blood-transfusion officer before it was given.

The patient presented a very grave picture, with a deepening jaundice, hæmoglobin 40%, and an oliguria amounting to two ounces of very deeply stained urine containing large numbers of red blood cells and casts. The case was seen in consultation with Lieut.-Colonel R. H. Dobbs, R.A.M.C., and it was decided not to try to produce a diuresis by the administration of large amounts of fluids intravenously. The object was to balance input and output and to infuse alkalis and hypertonic glucose. Three or four pints of fluid were given intravenously daily in addition to the fluids he retained by mouth.

In spite of these measures the patient's condition worsened: no urine was passed normally, but two ounces was withdrawn daily from the bladder by catheter. Daily blood-urea estimations had shown the amount to be rising by approximately 50 mg. per 100 c.cm. a day. On the eighth day after the original operation the patient's condition seemed critical. He was still vomiting four or five times a day, the oliguria at two ounces daily, and the appearance and the constituents of the urine remained unaltered. The blood-urea now stood at 400 mg. per 100 c.cm. and the hæmoglobin was 40%, but at no time was there any evidence of œdema.

After consultation with civilian colleagues who had had at that time some experience of peritoneal dialysis it was decided to perform a renal decapsulation. The hip-spica was removed (the thigh incision had healed), and the area was prepared for operation. This was conducted under spinal 'Percaine' anæsthesia. The right kidney was exposed and the findings on incising the capsule were similar to those described by Mr. Reid. Decapsulation was performed on the right side only and the wound drained by means of a corrugated rubber drain.

The subsequent progress was extremely interesting. From the day after the decapsulation increasing amounts of urine were passed daily with an increasing concentration of urine urea. The blood-urea however continued to rise until the fifth or sixth postoperative day, when the figure stood at 600 mg. per 100 c.cm.; the maximum diuresis was also obtained at about this period and thereafter with a steadily increasing urine urea the figure fell steadily. On the eighth day, just as the picture had begun to improve, a further crisis arose. The hæmoglobin had fallen to 20% owing to the formation of a moderate-sized hæmatoma in the renal wound. With a great deal of trepidation a further transfusion of two pints of blood was given, without any general or local reaction.

Letters to the Editor

THE REGIONAL BOARDS

SIR,—Many believe that the regional board will make or mar the future National Health Service. We have been interested to read the views of distinguished members of the medical profession as to how the regional boards might be constituted and administered, and we earnestly hope that Sir Leonard Parsons and Sir Ernest Rock Carling are right in assuming that the primary function of the regional board will be to organise and coördinate a hospital and specialist service which will provide the best possible facilities for the patients in the region. We do not, however, view with equanimity the suggestion of the former that the primary qualification of the chief executive officer should be his "intimate knowledge of the medical aspects of hospital care."

The regional board is not intended to interfere with the medical aspects of hospital care, which responsibility will, we hope, remain with the medical committee of the individual hospital. There is, however, a real danger of this happening by the overweighting of academic and medical representation on the regional board.

I doubt whether many really appreciate the enormous magnitude of the administrative task of these boards, and the great responsibility which rests with them in planning and thereafter supervising their vast hospital service. One of the most urgent duties will be to provide additional beds, and to stimulate recruitment of adequate nursing, domestic, and ancillary staff. The board is also responsible under the Act for the maintenance of existing hospital buildings, their equipment, furniture, and other movable property, and for the proper accounting of moneys granted by Parliament and disbursed to the hospitals in its region. It is obvious that much of the board's work will have to be done through committees and subcommittees.

The members of the regional board are part-time and unpaid. Let us be sure, therefore, that the chief executive officer is one with sound and wide experience of the administration of hospital services. He should be so equipped as to be able to interpret with knowledge the diverse interests of this vast regional organisation, and be without bias in the advice which he gives to his board upon the purely medical aspects of hospital care. In other words, there should be expert technical advice on tap and not on top.

Westminster Hospital,
London, S.W.1.

CHARLES M. POWER
House Governor and Secretary.

CORONARY OCCLUSION

SIR,—Dr. Maurice Newman's review of 50 cases of coronary occlusion in young adults (*Lancet*, Sept. 21, p. 409) and Sir Maurice Cassidy's Harveian oration (*Lancet*, Oct. 26, p. 587) prompt us to send you the following observations from our experience in Vienna during recent years.

Sex-incidence.—In 16 cases of coronary thrombosis occurring between 23 and 40 years of age there were only 3 women; while in a collection of 521 cases of all ages which one of us made from the literature, 81% were in men and 19% in women.[1]

Predisposing Factors.—The patient is typically tall and more developed in length than breadth with a never-tiring "vegetative hypertensive" temperament. Focal infection is common. Most cases have tonsillitis and dental granulomata, which we always treat after the infarct has healed. Physical strain, in our experience, is a rare cause and no strict time relationship can be established. We consider that tobacco in excess is a predisposing, and may even be a precipitating, cause. Syphilis is rarely even a possible factor; only 4% of our cases had positive Wassermann reactions. The significance of hypertension as an ætiological factor is difficult to assess, since the blood-pressure is lowered after the attack and information about the pressure before the occlusion is usually lacking.

Onset of Symptoms.—Careful history-taking shows that coronary thrombosis is not "a bolt from the blue"; all patients in our series had prodromal symptoms. Almost always these consisted in a sensation of precordial pressure of varying strength during physical exertion and excitement; the distribution may be circumscribed or diffuse.

Physical Findings.—Lewis[2] noted that the collapse in coronary occlusion resembled vasovagal syncope. We have studied 51 cases of acute cardiac infarction admitted to hospital within eight weeks of their first attack of pain.[3] Apart from persistent bradycardia attributable to a lesion of the right coronary artery, a temporary slowing of the pulse occurred in 15 cases. Electrocardiography showed this to be variously associated with auriculoventricular block, auriculoventricular nodal rhythm, sinus bradycardia, or simple sinus arrythmia. We describe a definite bradycardial phase (which we call phase I), with general flaccidity, low blood-pressure, bradycardia, and stupor; the electrocardiogram is characterised by wide high waves, the Q–T interval being at or above the upper limit of normal. We assume this condition to be due to an inhibiting, cardiogenic, vasovagal reflex[4]—a protective mechanism for the acutely diseased heart. This is followed by phase II, with a gradual or sudden onset of motor restlessness and tachycardia, which is certainly not protective and which is probably induced by th release of abnormal metabolites from the damag *myocardium.*

Diagnostically and prognostically we consider t recognition of substernal or parasternal discomfort oppression in young people to be most importa Electrocardiographic records may be valuable, especia when they are made under working stress. We ha also used our recently developed methods of investigati the dynamics of the heart by "rheocardiography."[5]

W. HOLZER.
K. POLZER.

Nervenklinik der Universität, Vienna.

SULPHONAMIDE GRANULOPENIA IN CHILDRE

SIR,—Your annotation of Oct. 26 does not, I thi sufficiently emphasise that while mild sulphonam granulopenia is fairly frequent in children, true agranu cytosis is very rare, especially with the less toxic mode compounds.

The benign form of granulopenia, or rather neut penia, disappears spontaneously when administration stopped, and no other measures would seem necessa Although it has become almost traditional to administ large doses of pentose nucleotide, its curative power very questionable, and it has often proved complete useless.

True agranulocytosis following sulpha drugs is a ve serious, but luckily rare, complication. Several clinicia have recently drawn attention to the value of penicill in preventing and combating the infection which cont butes to the fatal outcome of secondary agranulocytos In my opinion much more emphasis should be laid on t beneficial effects of whole-blood transfusion; it is present our most reliable weapon. In assessing t results obtained with folic acid and pyridoxine, it is w to remember that similar satisfactory results have bee claimed for nicotinic acid and various liver preparatio in the early days of sulphonamides.

French workers have lately suggested[1] that th leukæmic cell, which should be regarded not as a immature white blood cell but as an *abnormal* elemen creates a state of agranulocytosis by crowding out t normal granulocytes; they postulate an agranulocyt syndrome embracing both acute leukæmia and agranul cytosis proper.

I have often wondered whether some of the fulminatin agranulocytic complications in children, ascribed t sulphonamides, are not in reality rare instances of acut lymphatic leukæmia in the aleukæmic stage. The chil is usually very ill, with pyrexia and sore throat, an sulphonamides are given before the diagnosis is made Subsequent routine blood-counts may be indistinguish able from those in agranulocytosis. If the condition with no appreciable enlargement of lymphatic glands, i

---

[1] Polzer, K. *Mitt. Grenzgeb. Med. Chir.* 1913, 46, 169.

[2] Lewis, T. *Brit. med. J.* 1932, i, 873.

[3] Polzer, K. In the press.

[4] Jarisch, A., Richter, H. *Klin. Wschr.* 1939, 18, 185.

[5] Holzer, W., Polzer, K., Marko, A. Rheocardiography, Vienna 1946.

---

[1] Drouet, P.-L., Pierquin, L., Herbeuval, R. *Pr. méd.* Oct. 19, p. 677.

achieve the fullest coöperation between himself and his fellow officers, particularly those in other departments. Conditions vary widely from Service to Service, and it would seem fruitless for a medical officer to have to accustom himself to three types of Service conditions.

These remarks apply more to the general-duty medical officer than to the specialist, and the case for a combined Services medical organisation deserves full consideration. I would like to see a combined *hospital* system, staffed by officers who have been recommended for specialisation from all three Services, the general-duty officer continuing to serve in only one of the Services.

J. C. E. PESHALL.

LEFT TURN

SIR,—As one who belongs to no political party—a plague on all their houses—I find the robust, if somewhat démodé, communism of Dr. Kirman rather refreshing.

I wonder how many of my generation, the fifth decaders, have ever thought of themselves as protégés of n ex-ruling class now desperately trying to ally themelves with a decaying bourgeoisie? It is true that octors are in one sense (and only one sense) a privileged lass, their quite special and unique privilege being to erve the sick of all classes; but I should not have hought many of them conscious of any particular 'dignity' unless it be the proper pride of decent men nd women trying to do a difficult job decently.

Slogans are at best only poor half-truths, but I submit hat, on balance, there is more to be said for "government of the doctors, by doctors and potential patients, for patients" than for "government of patients and doctors, by politicians, for politicians."

Crediton. L. N. JACKSON.

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—Letters criticising Dr. Milligan's article of Oct. 12 show considerable ignorance of the nature and effects of electric convulsive therapy. As I have had occasion recently to make repeated visits to St. James's Hospital, I can testify to the good results of the concentrated method for chronic types of neurosis.

Patients do not suffer mental anguish when having electric convulsive therapy, nor does its effectiveness depend, as has been naïvely stated, on giving a "shock" at the conscious level, and, as it were, frightening the patient out of his illness. It has nothing in common with the "shocks" given in the last century—e.g., at Bethlem when a patient was allowed to fall through a trapdoor into a cold bath. On this principle leptazol would be more effective, since with it the patient may remember horrifying sensations preceding the convulsion. In electric convulsive therapy this never happens and yet it is equally successful. Furthermore, if a patient is always anæsthetised before electric convulsive therapy it is just as efficient. I recently saw a striking recovery from long-standing agitated melancholia where the patient was unaware that she had had electric convulsive therapy, because 'Pentothal' had preceded each shock. The fact that outpatients almost never refuse to go on with electric convulsive therapy shows how little they mind it.

There is no a-priori reason why electric convulsive therapy should be reserved for the psychoses. Only experience can show if the treatment will benefit the chronic neurotic who has failed to respond to psychotherapy and who is tortured by anxiety or by *folie de doute* or endless ritualistic acts. If left alone he is more likely to die by his own hand or by intercurrent disease caused by inanition.

The objection that the patient's brain may be injured is surely one for the neuropathologist rather than the psychotherapist, yet Frostig and others in the U.S.A. have conducted animal experiments over a number of years without finding any irreversible changes with such electric currents. While it is possible that 20 or more treatments with electric convulsive therapy may in cases of idiosyncrasy cause localised organic changes, there is as yet no evidence of permanent impairment from Dr. Milligan's treatment. Since his ex-patients remain under repeated observation any such effects would soon become apparent to himself or the patient's relatives.

Dr. Milligan has certainly made out a prima-facie case for this type of treatment in chronic and intractable neuroses. Until further results are available it would surely be advisable for those who have had no experience of the treatment to refrain from highly emotional and even libellous attacks on a responsible and energetic group of psychiatrists.

London, W.1. A. SPENCER PATERSON.

HYPERTENSION AND CALCIUM INTAKE

SIR,—Your review last week of *Studies in Hypertony and Prevention of Disease* attributes to me statements which I never made, and suppresses essential facts which our investigation established. I never stated that the chief villain of hypertony is calcium, nor have I ever claimed that it has been established that calcium is an important factor in the ætiology of hypertony. Only one conclusion is made in regard to this substance: "Calcium administered *per os* has a blood pressure raising action." But it does not follow from this that it is a causal factor in hypertony. The minimum amount of the substance required to raise pressure has never been studied by me.

Out of 114 pages of our book only 14 were devoted to our calcium experiments. We have done a fair amount of work on cholesterol which I hope has advanced our knowledge of the substance considerably. But this is not commented on. The section "influence of high intakes," which contains by far the most important contribution in the book and establishes a principle which physicians and nutritionists will have to heed—a principle which invalidates a good many requirement values and makes nonsense of the phytic acid theory—is not even mentioned in your review. Nor is the very existence of the section under the heading "periodical examinations" brought to the notice of your readers—although this contains in many ways a report on a novel experiment of particular importance at the moment.

Why did you give a distorted description of the book? Evidently your concern was the attitude I have adopted towards the adulteration of our bread, which has offended certain persons in authority.

Even more amazing is the article on page 793 by Kesson and McCutcheon on Hypertension and Calcium Intake which begins: "The statement has been made that a high-calcium diet is an important factor in the production of hypertension in subjects over middle age." Would the authors please give the passages in my book in which I made such a statement?

Why should they have expected to find a low blood-pressure in osteoporosis, seeing that this condition is not a simple calcium deficiency? They naïvely admit that it is possible to have "calcification of arm and leg vessels" with rarefaction of the bones. It follows from this that we may have arteriosclerosis and even high blood-pressure in osteoporosis. These cases have no bearing at all on our problem. But there are some data which are relevant to it. There is a statement that the affluent classes, whose intake of calcium is unusually high, show a prevalence of arteriosclerosis and allied conditions.[1]

Strange are the experiments of Kesson and McCutcheon in regard to a high calcium intake. Considering that their paper is concerned with hypertony, it is remarkable that no records of blood-pressure readings are given, and no evidence is produced that the myocardium of these patients is in a sufficiently healthy condition to react to pressure-raising substances; nor are we told the type of controls used. The investigators evidently relied on X-ray findings to demonstrate their thesis. I hope they know that we may have arteriosclerosis without hypertony, and vice versa, and that hypertony cannot be diagnosed by X-ray examination. But X-ray does not even lend itself to demonstrate a moderate increase of arteriosclerosis, the method not being exact enough for such a purpose. In rabbits we have demonstrated, by analysing the tissue of the aortas, that a high calcium intake increases enormously the calcium content of these vessels.[2] Heubner[3] kept cats on a high calcium intake

---

1. Arteriosclerosis, ed. by E. V. Cowdry, London, 1933.
2. Harris, L., Ireland, J. T., James, G. V. *Brit. med. J.* 1941, i, 49.
3. Heubner, W. *Biochem. Zschr.* 1925, 156, 171.

Good progress was maintained, and at the end of four to five weeks the renal condition was normal except for a slight amount of albuminuria. Slight bowing at the fracture site had occurred and was corrected on a Thomas splint. The patient was evacuated to the U.K. seven weeks after the original operation.

The points of interest in this case seem to me to be: first, the cause of the rapid hæmolysis, which I conclude to be lysis in the blood (fourteen days old); secondly, the absence of any reaction at the time of the *transfusion, due to general anæsthesia; thirdly*, the absence of œdema, due to balanced fluid control and not endeavouring to flog a tired and very sick kidney; fourthly, the very high blood-urea level reached with recovery not beginning until four or five days after the decapsulation; and fifthly, the production of these changes by the decapsulation of one kidney alone.

Childwall, Liverpool. WILLIAM PARKE.

SIR,—While Mr. Reid and his colleagues (Nov. 23, p. 749) are to be congratulated on the recovery of their patient suffering from anuria, it should surely be emphasised that these patients not infrequently overcome their suppression of urine without all the special procedures suggested. We have recently had a patient at this hospital who had a transfusion reaction due to Rh incompatibility and suffered from severe oliguria, passing only 47 oz. of urine in ten days, compared to an intake of 18 pints by mouth and 11 pints intravenously during the same period. This patient went downhill, becoming more and more drowsy and œdematous, until she was comatose with a blood-urea of 320 mg. per 100 c.cm. Apart from alkalis, sedatives, and fluids (despite increasing œdema) she received no special treatment. Renal decapsulation was considered, but not favoured by the consulting urologist. On the 12th day sudden diuresis most dramatically set in, and the patient subsequently made a complete recovery.

It is agreed that the aim of all treatment must be diuresis, and once the kidneys begin to function again the patient will in all probability recover, even when this happens at a very late stage. One cannot help feeling that renal decapsulation and peritoneal dialysis are serious operations in a patient already dangerously ill and surely must, in such a case, carry a mortality of their own. Are they really justifiable while the causation of this condition remains obscure and patients can recover without surgical interference even if almost moribund?

St. Mary Islington Hospital, London, N.19. R. W. DANZIGER.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—With reference to Mr. Hermon Taylor's article of Sept. 28, the following case I saw in 1933 is of interest.

A woman, aged 48, had a gastric ulcer of the lesser curvature, as shown in a recent radiogram, which had been treated medically. At 8.30 P.M. on May 20, while standing behind the counter in her grocery shop, she was seized with generalised abdominal pain and collapsed. Her last meal had been at 4 P.M., when she had had bread and butter, fish, and a cup of tea. I saw her at 10 P.M. Her pulse-rate was 140 per min., temperature subnormal, and respirations 40 per min. Her abdomen was board-like and she was continually retching but was too weak to vomit. I diagnosed an acute perforation, but the patient and her husband were strenuously opposed to operation, and against my conscience I continued to treat her, pointing out the hopelessness of the prognosis without surgical treatment.

She was put in Fowler's position, given nothing by mouth, and kept on morphine until the fourth day, when to my surprise her distress disappeared. She was now taking sips of water.

On the seventh day she complained of pain in the 5th, 6th, and 7th left intercostal spaces, radiating to the left loin on the 10th day, and she became feverish. It was thought that she had a subdiaphragmatic inflammatory condition and she was admitted to the Midland Hospital, Birmingham. There was a patch of absolute dullness at the base of the left lung and the chest was explored, but only a little bloodstained fluid was obtained which showed no organisms on culture.

Her temperature gradually subsided and she made an uninterrupted recovery.

Hurst and Stewart[1] mentioned that they had seen three patients with typical signs of perforated gastric or duodenal ulcer recover with starvation and morphine, operation having been refused. In two, recovery was uneventful; the other only recovered after a series of operations performed, during the following 6 weeks, for perigastric and subdiaphragmatic abscesses and empyema. "It is remarkable," was the authors' comment, "that recovery should have taken place in the only three cases we have met in which rational treatment was refused."

Birmingham. S. SILVERMAN.

ICTERUS GRAVIS NEONATORUM

SIR,—I feel that Dr. Third's article (*Lancet*, Nov. 2, p. 635) should not be allowed to pass without comment. His cases were diagnosed during 1944 and 1945. Since that time a large series of publications have appeared, many dealing with the serological complexities of the disease, and I feel that the additional knowledge th provide justifies a rather less pessimistic view than th apparently held by Dr. Third.

Dr. Third has based his observations, as no doubt will readily agree, upon a very small series of cases, a it is not stated in his protocols for how long after bi the condition was allowed to continue untreated. was certainly unfortunate in finding two possi imbeciles in his small series, and if more cases had be covered the percentage of mentally affected might ha been considerably less. On the other hand it is unprov that the mental changes are the direct result of t yellow staining of the cerebral nuclei; and we are the opinion that the cerebral degeneration responsi for subsequent imbecility is the result of prolong cerebral anæmia. It is for this reason that I raise t question of the relationship of the duration of the disea post partum and the date when treatment was fir started.

I am in complete agreement with Dr. Third th further investigation is needed to elucidate the proble *There is little doubt that isoimmunisation of the moth* may eventually produce different pathological picture but *seldom is a case so clear-cut as to present,* Dr. Third suggests, a picture of jaundice without hæmo lysis. In fact I know of no reliable evidence to suppor the idea that jaundice in cases of this type is ever trul "toxic", and not solely due to hæmolysis. Dr. Thir considers that only the "erythroblastæmic" cases a worthy of transfusion: in our experience the case wit a typical blood picture is usually one where the diseas has reached its "agonal" stage, and even then trans fusion has proved of value. On the other hand, it desirable that infants should never reach that stage affection, and whereas we agree that Race's suggestio of injecting the specific polysaccharide hapten (if suc it proves to be) *to neutralise free circulating* antibod is the obvious theoretical desideratum, the early dete tion of the possibility of erythroblastosis by antenat serological testing affords an immediately available an practical alternative.

Jessop Hospital for Women, Sheffield. C. CHRISTOPHER BOWLEY.

THREE IN ONE?

SIR,—I was most interested in your annotation o Oct. 12, and would like to comment on one point. Yo suggest that if medical officers worked *in turn* in all thre Services there might be a wider variety of clinica experience than is obtained at present. This is true but it would endanger a very important part of th *medical officer's usefulness.*

Practice in the Forces is not merely a matter o prescribing the correct treatment; it is *necessary* t know the conditions under which the patient is living and the spirit of the Service, so *as to* understand the mental atmosphere, for instance, on the mess decks in a ship. What is required of a man in the performance of his duty must also be known. *The patient* has much more confidence in the medical officer who understands these things. *Regulations* can be learnt from the books, but it is by experience that things are *done* the best way. Experience alone can teach the medical officer how to

---

1. Hurst, A. F., Stewart, M. J. *Gastric and Duodenal Ulcer*, London, 1929.

Parliament

QUESTION TIME

Parcels for Europe

In answer to a question, Mr. John Strachey announced that the Government had decided to allow individuals in this country to send food parcels to individuals in any country overseas including Germany. He was arranging for "Save Europe Now" to provide facilities for people who had not friends abroad but who wished to help. Parcels would be restricted to one a month with a gross weight of 7 lb., and only rationed foods, including goods on points, would be allowed. He was happy that it had now proved possible to make these arrangements because it was no longer possible for this country to send bulk supplies of food abroad. The considerable supplies sent last year represented a serious sacrifice. Today our stocks of food, particularly grain, were much lower than at this time last year and it was out of the question for us to make any diversions from them.

Food Ration in British Zone

Mr. R. R. Stokes asked the Minister of what the 1550-calorie ration in the British zone was comprised.—Mr. J. Hynd replied: The composition of the ration varies with the supplies available, and all the items on the ration do not, of course, figure in each day's diet. The following are the details:

Foodstuff	*Weight in ounces*	*Calorific value*
Bread	12½	875
Potatoes	12½	232
Other vegetables ..	2½	11
Skimmed milk ..	4·4	43
Cereal foods	1·9	176
Meat	0·6	28
Fish	0·75	29
Fats	0·25	51
Sugar	0·9	107
Cheese	0·08	5

World Cereals

Replying to a further question, Mr. Strachey said that the total exportable surplus of wheat and coarse grains for 1946–47 was estimated by the International Emergency Food Council at about 25 million tons. Total import requirements of wheat and coarse grains as presented to the council were about 35 million tons. This serious gap between supply and demand would no doubt be somewhat reduced by a careful scrutiny of the requirements submitted by various countries. In fact, however, the general world position was not our main immediate concern. Recent events in North America had gravely affected the ability of both the Canadian and the United States authorities to move wheat for export. The transport position in the United States would govern the flow of cereal supplies to this country over this winter rather than the amount of cereals potentially available in North America. These transport difficulties had already become sufficiently serious to deplete our stocks to a level much below that of this time last year. "It is for these reasons that I must warn the House that there is at present no possibility either of derationing bread or of diverting supplies to Germany or anywhere else. On the contrary, we shall have to take the most vigorous measures to keep our own stocks up to the minimum level at which we can be sure of meeting the present ration."

Employment of ex-Service Doctors

Mr. S. Hastings asked the Minister of Health how many ex-Service doctors were unable to obtain employment in general practice; and if he would make a statement as to the provision of employment for such doctors until the National Health Service Act came into operation.—Mr. Bevan replied: I regret I have not the information requested in the first part of the question. Ex-Service general practitioners can take the hospital posts and refresher courses available under the Government's postgraduate scheme and it is then open to them to buy or open a practice or to seek assistantships or other appropriate employment in the usual way during the interim.—Mr. Hastings: Is the Minister aware of the great difficulty there is among doctors in obtaining assistantships at the present time?—Mr. Bevan: Yes, I am aware that there is a difficulty. It is a difficulty which always arises immediately before great changes are made. We are doing our best to mitigate the hardships where we can.

Willesden General Hospital

Mr. E. H. Hardy asked the Minister whether he was aware that the committee of the Willesden General Hospital, a voluntary hospital, had refused to set up a consultative committee in defiance of his advice to all hospital authorities; and what further steps he proposed to take.—Mr. Bevan replied: I am drawing the attention of the hospital authority to the recommendation I have already made that there should be a nurses' representative council in every hospital.

Scottish Bill

In the House of Commons on Nov. 26, Mr. J. Westwood, the Secretary of State for Scotland, introduced the National Health Service (Scotland) Bill which was formally read a first time.

Medicine and the Law

Non-consummation and Nullity of Marriage

In J. *v.* J., reported in the *Times* of Nov. 23, Mr. Justice Jones refused a wife's petition for the annulment of her marriage where the husband, before the date of the marriage, had undergone an operation which rendered him sterile. Her counsel's arguments echoed phrases heard in the case of Cowen *v.* Cowen last year (*Lancet*, 1945, ii, 183, 215). One of the principal ends of marriage had been frustrated by the husband's operation. Mr. Justice Jones, however, finding that the wife was aware of the disability at the time when she agreed to marry, declined to annul the marriage. The surgeon, it seems, had refused to operate unless both parties signed a statement that they consented to, and appreciated the effect of, the operation. They both signed. The wife's evidence was that she hoped the operation would be postponed till after marriage; but the court found that she married with knowledge that it had been performed.

Her petition alleged inability to consummate or, alternatively, wilful refusal to do so. Before the Matrimonial Causes Act of 1937, sometimes called the "Herbert" Act, inability to consummate was the only ground on which a marriage, though not void, could be avoided. Section 7 of the Herbert Act made a marriage voidable on the additional ground of non-consummation due to the respondent's wilful refusal. Mr. Justice Jones held in the recent case that there was wilful refusal, though, as already stated, he held that the wife's prior knowledge of the husband's condition was fatal to her petition.

Consummation is construed as ordinary and complete sexual intercourse. In the Cowen case it was established that there is no consummation if the sexual act is so performed that its natural termination (the passage of the male semen into the woman's body) is artificially and intentionally prevented. Even in the circumstances of the Cowen case, however, the court was careful to add the warning that, if this incomplete intercourse took place with the wife's consent, and if she did not object till a later date, her petition for annulment would be rejected unless she could show some justification for the consent she had previously given. The basis of the recent decision in J. *v.* J. is the general principle, however, stated from time to time in litigation of all kinds, that a party cannot "approbate and reprobate." The House of Lords speeches in G. *v.* M. in 1885 contain dicta which are important. "Any act," said Lord Chancellor Selborne, "from which the inference ought to be drawn that during the antecedent time the party has, with a knowledge of the facts and of the law, approbated the marriage which he or she afterwards tries to get rid of, has taken advantages and derived benefits from the matrimonial relation which it would be unfair and inequitable to permit him or her, after having received them, to treat as if no such relation had ever existed. That explanation can be referred to known principles of equitable and, I may say, of general jurisprudence." The facts of the 1885 decision established no case whatever of the wife's pre-matrimonial assent. The husband in that case was found by the courts to have been impotent; that was not a matter of which the wife could have been aware before marriage. But the observations of Lord Selborne, cited above, were such as Mr. Justice Jones could not ignore.

and found that the arteries and tendons contain more calcium than other tissues on it. Judging by the data from animal experiments—and there would not be much left of physiology or pharmacology if such data were not valid for man—the 19 patients under a high calcium intake must have had increased deposits of calcium in the vessels as a result of the treatment; nay, more, a simple calculation shows that a pronounced positive calcium balance, extending over 15 months, and even over 18 weeks, must have caused an enormous accumulation of calcium in these patients, part of which without the slightest doubt must have been deposited in the vessels. The calcium obviously is somewhere in the organism; and this proves that no reliance whatever can be placed on X-ray in an investigation of this kind.

But let us disregard this vital fact for a moment. At any rate one case out of the 19 has shown an increase of arteriosclerosis demonstrated by X-ray whilst under treatment. Kesson and McCutcheon say that this was not due to the high calcium intake. But have they produced valid evidence that this is so? They have not, and they cannot produce such evidence. It is clear that they must admit, to put it at its lowest, that there is a *possibility* that in one case arteriosclerosis increased as a result of the treatment! They naïvely say that they supplemented the ordinary diet with calcium. Clearly a calcium intake which causes a positive balance for 15 months is not given in the interest of the patient. At the beginning of the experiment they could not know the results of this high calcium administration, and according to their own showing there is a *possibility* that they have actually inflicted an injury on at least one of the patients.

By adding calcium to bread the authorities concerned are conducting a larger experiment—on forty million human beings! Everybody admits that millions and millions of people do not need the added chalk. The possibility of their suffering injury by it cannot be excluded. These millions are exposed to an unnecessary risk. As a matter of fact it is certain that an intake of such a potent substance as calcium in unnecessary quantities must inflict injury. If it is retained it is bound to do harm, while if an unnecessary amount of calcium passes out via the kidney it causes unnecessary renal strain.[4] There is not a shadow of doubt that the additional chalk must in many instances cause injury and shorten life.

The attack on my calcium experiments can have only one object—to confuse the issue and to mislead. Let me quote what I really say: "In considering it [the adulteration of our bread] the matter in this volume can be disregarded entirely" (p. 10). I have always maintained that the onus of proving their case rests with the authority which forced the added calcium on us. They must produce solid reasons why the adulteration of our bread has become necessary, and they must prove that it cannot possibly do harm. It will be seen from my letter in your issue of Oct. 12 that those responsible for the added calcium have virtually admitted that when the recommendation was made there was no valid reason for it. On p. 9 of my book I say: "No physician outside bedlam would suggest that a high blood-pressure case should consume extra doses of blood-pressure raising substances." And this is exactly what is being inflicted on many people today.

I have suffered calumny and persecution because of my expression of these views. I was prevented from obtaining a research-worker during the war, and it has been quite impossible for me to get a paper published on calcium in relation to hypertony, apart from the intrinsic merit of my effort, simply because no editor dared to offend a highly placed personage! This book was published almost a year ago, yet only one medical journal has dared to review it up till now. And it is quite clear that the only type of review you dare to publish is the one you have actually published; and you have atoned for it by the prompt publication of that precious article with which I deal in this letter.

Well, my book is available, and your readers may judge. My experience is not a happy augury for the shape of things to come, when we shall have fully fledged Government scientists.

I. HARRIS.

Liverpool.

RESISTANT GONOCOCCI

SIR,—In the autumn of 1943 I had the care of a nur of gonorrhœa cases at Mombasa. At that time sul pyridine was the only remedy available. It soon bec apparent that a high proportion of infections contra in South African ports were resistant to sulpha dru so much so that the arrival of a ship from the south the inevitable prelude to a further batch of cases to treated by traditional methods. In most of thes definite unstained areola could be seen around isolated stained gonococcus, and this was assumed indicate the presence of a capsule. When this areola demonstrated in the first urethral smears taken admission it was possible to predict with confidence t chemotherapy would fail. The gonococci involved w thought to be specifically resistant to sulphapyridine this was the only drug generally accessible for s treatment in South Africa.

I write to you now because the same phenomenon appearing in a small group of penicillin-resist gonorrhœa cases under my care: it may indicate so link between the capsulated gonococcus and resista to a specific drug, though not necessarily to all forms chemotherapy at the same time (the first two penicill fast cases later yielded to sulphathiazole). Certain strai of capsulated gonococci have been described academicall and the coincidence of capsule and resistance in the cases may be merely accidental. All the same t relation might be worth investigating with bett facilities.

S.S. *Arundel Castle.* W. S. PARKER, Surgeon

A MORAL PROBLEM

SIR,—Your annotation last week raised seve interesting points. Personally I hope that a serio effort will be made to collect together the results of the experiments carried out on prisoners in Germ camps, and that anything of value will be publishe The reasons given against such publication seem to to be simply pernicious sentimentality. If I myself h been a victim, and some results of value or of interest h been obtained from my death, I am sure that I shou have preferred to know that this knowledge would ha been used and that I had not died entirely for nothin

At times I have felt a good deal of sympathy for son of those who were responsible for carrying out t experiments. Accounts of the trials leave little dou that many of the so-called scientists were men of academic standing, with no idea how to carry out experiment, and some were no more than irresponsib sadists; all these deserve the appropriate treatment the hands of the courts. But others were serious researc workers. If one were given the chance of using prisone for experiments which one believed to be of gre importance and value to mankind, what would one d particularly if government propaganda had convince one that the victims were dangerous criminals who we anyhow condemned to death, and likely to die in son particularly abominable manner? This is indeed moral issue, and I am not at all sure what I should myse have done. I have always been most fortunate, in th I have been able to obtain willing and coöperativ volunteers when I have wished to carry out experiments o man, but there are many types of investigation for whic one must hesitate to use such subjects. I believe tha while capital punishment is retained, condemne murderers should be given the opportunity of volunteerin to serve as subjects for experiments. The question rather different when the victims are innocent prisoner though to a keen research-worker with little contact wit the world outside his laboratory and who believes wha his government tells him the answer may be simpler.

The method in which these results should be publishe requires careful consideration. At all costs sensationalism must be avoided, and it might perhaps be as well to grad them as "confidential" and make them available onl to bona-fide investigators. Otherwise the press shoul be taken into the confidence of those responsible for th editing of the reports before publication; the averag journalist is a responsible person, and in this way accurat and unobjectionable reporting would be ensured.

KENNETH MELLANBY.

Department of Entomology, London School of Hygiene and Tropical Medicine.

---

4. Harris et al. High Blood Pressure, London, 1937.

APOTHECARIES' HONOURS

THE Society of Apothecaries of London have presented their medals in therapeutics to Sir Alexander Fleming and Sir Howard Florey in recognition of their work on penicillin. At the presentation ceremony on Nov. 28 Prof. E. C. Dodds likened the occasion to the gathering in 1892 at the Sorbonne, in Paris, when Lister delivered the main address at the celebration of Pasteur's seventieth birthday. As Lister said of Pasteur so might it be said of Fleming and Florey: "You have lifted the veil of mystery which throughout the centuries has covered the infectious diseases." These two men had added the final touch to Pasteur's brilliant series of experiments. No two men in history could claim to have saved more lives; and it was an added satisfaction that their discoveries could not be applied to destruction.

In reply, Sir Alexander Fleming recalled how the surgeons' complacency about sepsis had received a severe jolt in 1914. They had started to pour all kinds of chemicals into wounds to kill the microbes, but they had done more harm than good until they returned to their job of cleaning up the wounds. He compared the distressing scenes in a hospital for fractures in Wimereux in 1918 with the relative comfort of fracture cases in this war. Sir Howard Florey remarked on the astonishing series of chances which had led to the introduction of penicillin therapy. There were, he said, some hundred thousands of moulds closely allied to *Penicillium notatum*, and almost all were deadly poisons; yet *P. notatum* was the first to be investigated as an antibiotic. If they had begun with the poisonous species they might well have tired before they reached the one which proved to be non-toxic.

The society also debated the admission of women to its freedom. Mr. T. B. Layton urged the society to make itself a suitable body to play a responsible part in the National Health Service. The Government would not recognise such a body unless it contained women. The question will be decided by the Court of Assistants on Dec. 17.

Finally the Master presented a cheque and scroll to the retiring bedell, Mr. W. T. Withers, in recognition of 59 years of faithful and kindly service.

THE SISTER KENNY FILM

IN a film simply entitled *Sister Kenny*, the RKO Picture Corporation and Miss Rosalind Russell present a restrained biography of this provocative personality, based on Miss Kenny's book, "And They Shall Walk." Her early years as a bush nurse in Queensland introduce her to the disease which she makes her life study; left on her own without medical advice she treats the acute stage of infantile paralysis with hot packs, and then when she believes her patient to be cured she is faced with paralysis. This she treats by careful muscle re-education. Six cases under her sole care do well, and then, the epidemic having subsided, she reports to her nearest medical centre. The local doctor is astounded by her story, which she repeats at his request to the nearby orthopædic specialist; he is frankly incredulous and mildly insulting, even when she shows him one of her patients. Considerably nettled by this opposition to what appears to this young nurse as self-evident facts she boldly opens a small centre for treating by her methods the failures of more orthodox treatment. This centre is forced to close by local medical opposition, and then she enlists for World War I. She has decided to marry on her return, but a fresh polio epidemic in her home area claims her attention and then she goes, against the advice of her local doctor, to a larger outbreak in Brisbane. Here she meets the full force of orthodox medical opposition, and indulges in a public argument with the eminent orthopædic consultant. Some years later sees her undecided whether to go to Britain at the invitation of the L.C.C. or to stay at home to give evidence before a Royal Commission on her work; she goes to Britain, but is shortly recalled by public acclaim to a fresh epidemic in Australia. After her return the wholly unfavourable Royal Commission report is published, and a little later her book receives a storm of criticism. Disappointed yet undaunted the now elderly lady goes to U.S.A. on a long lecture tour, but is apathetically received. She decides to return home, but at the last moment is asked by the citizens of Minneapolis to open a treatment centre. Here her lifelong ambitions of treating acute cases early and of describing her methods to medical men are realised in spite of severe criticism of her work by a U.S. commission.

Although it comes from Hollywood, that centre of ballyhoo, and is concerned with a notably controversial subject, the film tells without undue sensationalism a sincere story of devotion to a cause. The medical profession is nobly represented, whether as the frankly admiring Dr. Alexander or the outraged Sir Charles Brack; but there is no hint that a knowledge of muscle exercises has leaked through to the doctors, who are shown treating their cases only with splints and black despair. Few will deny that doctors are, in the main, conservative, and that they have a deep and often soundly rooted objection to novel ideas on treatment devised by unqualified persons. But in this case, Sister Kenny's idea has been thoroughly examined and as thoroughly rejected by the main body of opinion here and in the U.S.A. Inevitably the film must leave in some lay minds the idea that a wonder treatment awaits but for the doctors' perversity. Is this quite fair to the public? It might be better if RKO had chosen a subject that doctors should have examined but have not. Perhaps they will try again. There should be no lack of suggestions.

ALL DONE BY SEALS

THE Christmas seals of the National Association for the Prevention of Tuberculosis are now well known. This year the design shows an old-fashioned lamplighter, with his ladder set against the lamp, under a starry sky.

It is impressive to realise how much work for the tuberculous depends on the sale of these coloured stamps. The association has worked for 45 years, by means of education, research, and propaganda, to reduce the disease. During the past year Dr. Santon Gilmour's report on tuberculosis in the West Indies has been published; the N.A.P.T. handbook of tuberculosis schemes has been revised and reissued; a new publication—*Tuberculosis Index and Abstracts of Current Literature*—has been started in association with the Tuberculosis Education Institute; and a new popular quarterly called *Health Horizon* has been founded. The association has continued to advise and educate the public by answering inquiries, by publishing non-technical leaflets and magazines (including one for young people called *The Lamplighter*, launched last June), and by its social welfare department. Refresher courses, conferences, and meetings have also been arranged.

All these activities are financed by the sale of Christmas seals. Twenty-four million of these, the gift of the Canadian Tuberculosis Association, are now available, and are sold at the rate of 4s. for a sheet of a hundred by the N.A.P.T., Tavistock House North, London, W.C.1.

University of Oxford

The following degrees were conferred on Nov. 23:

D.M.—L. J. Bussell (in absence).

B.M., B.Ch.—Robert Ebsworth Snow, T. A. Madden.

University of London

Sir Ernest Graham-Little has resigned from the chairmanship of the external council of the university owing to heavy parliamentary work. Sir Ernest has been chairman of the council for nearly 25 years.

University of Manchester

Mr. A. M. Boyd has been appointed full-time professor of surgery and director of the department of surgery from Dec. 25.

Mr. Boyd was educated at Haileybury, and studied medicine at St. Bartholomew's Hospital, qualifying M.B. in 1929. In 1931 he became a F.R.C.S. At St. Bartholomew's Hospital, after holding several other posts, he was appointed demonstrator in anatomy, and for three years was an assistant in the surgical professorial unit. He was surgeon to an E.M.S. hospital in 1939 and 1940, before joining the R.A.M.C. Early in 1941 he was posted to the Middle East, and he served in Egypt and Palestine for four and a half years. In 1942 he was promoted to lieut.-colonel and placed in charge of the surgical division of 63 General Hospital, Cairo, where under his direction a centre for vascular injuries was established. He returned to England in November, 1945, and resumed his duties at St. Bartholomew's Hospital, where he became an assistant surgeon last April. His special interest has been peripheral vascular disease, on which he gave a Hunterian lecture in 1935; he has published a number of papers on this and other subjects.

University of Leeds

Dr. B. N. Tattersall has been appointed a full-time lecturer in medicine.

British Postgraduate Medical School

Dr. Denis Hill has been appointed consultant in medical psychology at the school in succession to Dr. Eliot Slater, who has resigned. The L.C.C. have given him permission to hold this new appointment simultaneously with his present post of electroencephalographer at the teaching and research laboratory at the Maudsley Hospital.

Courses for Medical Artists

Arrangements have been made for student medical artists to be accepted at the Central Middlesex Hospital for a three months' course at a fee of 15 guineas.

Diary of the Week

DEC. 8 TO 14

Monday, 9th

Medical Society of London, 11, Chandos Street, W.1

8.30 P.M. Dr. F. T. Evans, Dr. Cecil Gray: Modern Anæsthesia.

Tuesday, 10th

Royal College of Physicians of London, Pall Mall East, S.W.1

5 P.M. Sir Arthur MacNalty: History of State Medicine in England: From the Accession of Queen Victoria to the General Board of Health. (First FitzPatrick lecture.)

Royal Society of Medicine, 1, Wimpole Street, W.1

5.30 P.M. *Psychiatry.* Leucotomy as an Instrument of Research: Dr. A. Meyer, Dr. T. McLardy (Neuropathological Studies); Dr. S. Last, Dr. G. Greville (Electroencephalographic Studies).

Chelsea Clinical Society

6.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Dr. Stanley Leader, Mr. Robert Cutler: Plastics in Surgery and Medicine.

London School of Dermatology, 5, Lisle Street, W.C.2

5 P.M. Dr. R. M. B. MacKenna: Principles and Practice of Treatment.

Edinburgh Postgraduate Board for Medicine

5 P.M. (Royal Infirmary.) Prof. Guy Marrian, F.R.S.: Biochemist's Approach to Problems of Pharmacological Activity.

Wednesday, 11th

Royal Society of Medicine

4.30 P.M. *Physical Medicine.* Dr. E. L. Sturdee, Dr. Marjory Warren, Dr. A. R. Neligan: Contribution of Physical Medicine in the Care of the Chronic Sick.

Royal Institute of Public Health and Hygiene, 28, Portland Place, W.1

3.30 P.M. Sir Allen Daley: Public-health Services of London During the Past Hundred Years.

Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1

2.30 P.M. Prof. Harold Burrow: Future Control of Abattoirs and Knacker Yards.

Society of Chemical Industry

6.30 P.M. (Chemical Society, Burlington House, Piccadilly, W.1.) Mr. D. P. Hopkins: Fertilisers, Manures, and Nutrition.

Association of Industrial Medical Officers: Scottish Group

3 P.M. (Institute of Hygiene, University of Glasgow.) Prof. T. Ferguson and assistants: Symposium on Occupational Medicine.

Thursday, 12th

Royal College of Physicians

5 P.M. Sir Arthur MacNalty: History of State Medicine in England: Medical Department of the Privy Council. (Second FitzPatrick lecture.)

Royal College of Surgeons of England, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. W. Rowley Bristow: Injuries of the Peripheral Nerves in Two World Wars. (Robert Jones lecture.)

Royal Society of Medicine

8 P.M. *Neurology.* Dr. L. Guttmann, Mr. E. W. Riches, Dr. D. Whitteridge, Dr. P. Jonason: Treatment and Prognosis of Traumatic Paraplegia.

Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W.1

8 P.M. Prof. B. S. Platt: Colonial Nutrition and its Problems.

London Jewish Hospital Medical Society

8.30 P.M. (Woburn House, Upper Woburn Place, W.C.1.) Mr. S. I. Levy: Principles of Urinary Surgery. (Presidential address.)

Middlesex County Medical Society

4 P.M. (Redhill County Hospital, Edgware.) Clinical meeting.

Socialist Medical Association

7.30 P.M. (296, Vauxhall Bridge Road, S.W.1.) Dr. J. Tylor Fox: Social Aspects of Epilepsy.

London School of Dermatology

5 P.M. Dr. F. R. Bettley: Seborrhœic Dermatitis.

Friday, 13th

Royal College of Obstetricians and Gynæcologists, 58, Queen Anne Street, W.1

5 P.M. Mr. Victor Bonney: Myomectomy.

Royal Society of Medicine

3.15 P.M. (Manchester Royal Eye Hospital.) *Ophthalmology.* Prof. Geoffrey Jefferson: Surgery of Intracranial Aneurysms. Cases will be shown.

5 P.M. *Clinical.* Cases will be shown at 4 P.M.

8 P.M. *Radiology.* (Joint meeting with the British Institute of Radiology and the Faculty of Radiologists at 32, Welbeck Street, W.1.) Carcinoma of the Stomach: Dr. J. L. Grout (X-ray diagnosis); Mr. H. Rodgers (Gastroscopy).

Royal Sanitary Institute

10.30 A.M. (Sessional meeting, Warrington.) Dr. S. F. Allison: Welfare of Old People. Dr. J. E. Nicole: Mental Health of the Elderly.

Royal Institution, 21, Albemarle Street, W.1

9 P.M. Mr. C. R. Harington, PH.D., F.R.S.: Body's Chemical Mechanisms of Defence.

London Chest Hospital, Victoria Park, E.2

5 P.M. Dr. Franklin Wood: Recent Advances in the Radiology of the Lungs.

Saturday, 14th

Royal Society of Medicine

10 A.M. (32, Welbeck Street, W.1.) *Radiology.* (Joint meeting, continued.) Carcinoma of the Stomach: Prof. M. J. Stewart, Mr. Hermon Taylor, Dr. G. C. Fairchild, Mr. Alan Shorter, Dr. D. Jennings.

Notes and News

BIRTH-CONTROL

WITH opening speeches by a geneticist, a gynæcologi a general practitioner, and a judge of the high court, m aspects of birth-control were considered at last week's d cussion by the Royal Society of Medicine. Dr. E. B. Fo said that the question of voluntary control because of t risk of transmitting hereditary disease does not arise ve often, since most of the conditions themselves restrict proc ation. Mutation, he said, is a rare phenomenon, 1 in 150,0 being a high frequency in man; and the balance must struck between mutation and selection. The chances transmission depend on whether the condition is heter zygous or homozygous, and on the kinship of the parents.

Mr. **Aleck Bourne**, discussing the harm that may possib be done by the various forms of birth-control, said th chemical spermaticides probably do little damage, apart fro minor irritation of the vagina with preparations containi quinine, or lactic acid in strengths over 3%; there is n evidence of an increased incidence of vaginitis among wome who use this method. The occlusive pessary which along wit a spermaticide is the method of choice, is also harmles Intra-uterine foreign bodies, now increasingly fashionabl are liable to cause pressure ulceration and infection. Th Gräfenberg ring is unreliable, and acts, moreover, as a abortifacient after conception in the fallopian tubes; i is thus illegal. Douches are useless. Finally, coitus interruptu is both unreliable and bad, leaving the woman, who does no *attain an orgasm, with unresolved pelvic congestion*; if thi is repeated often enough, neurosis ensues. The sustained us of contraceptives deprives the woman of the intangibl physiological stimulus, quite apart from the joy of having family, which is derived from childbearing. It is debatabl whether continued contraception causes sterility, except wit a foreign body in the uterus, or with coitus interruptus whic may interfere with ovulation. There is no substantial evidenc that chemicals introduced into the vagina in spermaticide interfere with absorption of hormones from the semen; an there is no indication of deleterious effects from the intermittent use of contraceptives to space pregnancies. The epoch has changed inexorably and irreversibly since the Victorian era with its habit of yearly childbearing. Women now view childbearing differently: "those who would abolish contraception must abolish the circumstances which have brought it into being."

Dr. **Kenneth McFadyean** pleaded for premarital instruction by doctors, who should themselves receive mor instruction. A chemical contraceptive with an occlusiv pessary is, he said, infallible, harmless, and devoid o anatomical or æsthetic objections.

Sir **Travers Humphreys** said that the practice of contraception is not unlawful. Marriage is a contract, of which consummation is an implied condition; and non-consummation is in most countries a ground for annulment. Last July the Court of Appeal held that a marriage is consummated if penetration is followed by *emissio seminis*; thus a wife may seek annulment if a rubber sheath is used. The reverse does not hold true: if the wife excludes the chance of pregnancy by herself practising contraception there is no ground for divorce. Abortion is undoubtedly criminal; therapeutic necessity is the only ground on which abortion can be approved or excused, and "I sincerely hope that neither by Parliament nor by the judges will the decision by Mr. Justice McNaughton be doubted." The matter is not so much one of law as of the good sense of the jury. The test is, does the doctor honestly believe that it is essential in the interests of the woman's health to do the operation? Here the doctor is put in the same place as the surgeon; to cut off a leg is a serious assault, and the only reason it is not criminal is the interest of the patient's health and life. The patient's personal wish is no defence in law; any doctor, for example, performing an operation for sterilisation simply at the patient's wish is exposing himself to a charge of criminal assault.

TUBERCULOSIS ALLOWANCES

FOR dependent children the Minister of Health has authorised, with effect from Dec. 16, the following payments under the scale of tuberculosis allowances laid down in memorandum 266 T:

	s.	d.
aged 11 and under 16	10	6
aged 5 and under 11	9	0
aged under 5	7	6

MALNUTRITION
IN RELEASED PRISONERS-OF-WAR AND INTERNEES AT SINGAPORE

J. B. MITCHELL
M.B. Lond.
LATELY MEDICAL SPECIALIST
R.A.M.C.

J. A. BLACK
M.B. Camb., M.R.C.P.
GRADED PHYSICIAN
R.A.M.C.

THIS report deals with 1230 patients admitted to the 17th British General Hospital, Singapore, between Sept. 9 and Oct. 8, 1945, mainly from camps in Singapore, Sumatra, Java, Borneo, Sarawak, and Bangkok. Of these, 86% were British Servicemen and civilians, the rest being mainly Australian and Dutch; only 1·6% were women. The greater part were admitted because, in the opinion of the camp doctors, they were not fit to make a voyage in a fully equipped hospital ship.

Nearly all these patients had been in captivity since February or March, 1942. The degree of maltreatment imposed by the enemy varied in the different camps, but usually the diet was deficient in proteins, fats, and vitamins. Rice, the staple article of diet, was usually highly polished. Most camps saw a quantitative reduction in rations early in 1945, which was maintained.

Burgess and Cruickshank (1946) stated that the diet at the military camp at Singapore supplied about 2500 calories daily, though in the last year the figure fell to 2000 calories, and that it was unbalanced in respect of the components of the vitamin-B complex. Bennet (1946), describing conditions in Formosa, spoke of the importance of conditioning factors—the harsh standards of fitness for work enforced by the Japanese and the prevalence of diarrhœa.

One of our patients gave this account of his diet between August, 1944, and August, 1945, when he was doing heavy manual work in Sumatra: rice 320–400 g., tapioca meal 70–100 g., daily; vegetables variable, consisting of jungle roots and leaves; fruit, usually green mangoes, issued occasionally; meat, a cube about the size of a large lump of sugar, issued every fifth or sixth day; meat bones used to be boiled again for soup and finally ground up and eaten.

The diet in a prison holding British civilians in January and February, 1944, consisted of a pint of hot water at 8 A.M., and $^1/_2$ pint of cooked rice with about a dessertspoonful of curry sauce at 11.30 A.M. and again at 6 P.M. The rice was often rancid.

Rice-polishings and synthetic vitamin preparations were always scarce and often unobtainable.

ANALYSIS OF CASES

Nearly all the patients admitted to the hospital in the month under review were extremely wasted. Many men admitted for malaria or diarrhœa had or developed signs of vitamin deficiency. The patients were admitted for the following disorders:

Disorder	*Cases*	
Malnutrition	577	(*46·9%*)
Malaria	73	(*5·9%*)
Dysentery or diarrhœa	87	(*7·1%*)
Surgical complaint	82	(*6·7%*)
Some other disease	163	(*13·3%*)
Mild malnutrition (ambulant cases)	81	(*6·6%*)
Unclassifiable (inadequate case-notes)	167	(*13·6%*)
Total ..	1230	

In the 577 cases admitted for malnutrition the outstanding lesions were as follows:

Outstanding lesion	*Œdematous cases*	*Non-œdematous cases*	*Total*	
Amblyopia	8	28	36	(*6·2%*)
Riboflavin deficiency ..	0	3	3	(*0·5%*)
Skin lesions	9	16	25	(*4·3%*)
Tongue lesions ..	51	59	110	(*19·1%*)
Neurological	88	64	152	(*26·3%*)
Other lesions	197	54	251	(*43·5%*)
Totals ..	353	224	577	

GENERAL MALNUTRITION

Many combinations of signs due to food deficiency were seen. Symptoms and signs varied in severity from simple wasting, with or without œdema, as seen in ambulant cases, to extreme emaciation and inanition.

In the most severe cases there was a history of having been in bed for two months or more and of being unable to assimilate the increased diet on liberation. There was always a history of passing frequent watery stools for three weeks or more. On examination lethargy was present; it took an abnormally long time to make the patient fully awake. Laycock (1944), describing starvation in China, remarked on the tediousness of extracting a history, and we found the same thing. When the patient was fully roused, orientation in time and space was normal. Speech and movements were feeble and slow, the voice weary, and the expression lethargic and immobile. There was no complaint, no desire for food, and apparently no desire to live. Respirations were slow and shallow, pulse feeble, and blood-pressure subnormal. Emaciation was extreme. The skin was coarse, wrinkled, and dry. Especially over the backs of the hands, elbows, knees, ankles, and neck it was thickened and scaling. The mucosæ were pale, and the tongue small and sometimes reddened. The mouth was dry. Œdema varied from a little pitting over the dorsa of the feet to massive œdema with multiple effusions into the serous cavities. Œdema sometimes increased during recovery.

Signs of vitamin deficiency often appeared after an improvement in the diet, occasionally at an unexpectedly late date and after several weeks' hospital diet and vitamin therapy, and they often became more pronounced after a fever. An exception to this was the reduction in œdema which often took place during an attack of malaria or of diarrhœa.

CASE 1.—A male civilian, treated for several months for peripheral neuritis and amblyopia, had been on a good diet and vitamin therapy for two weeks before admission on Sept. 11. He complained of blurred vision and numbness and tingling in the feet. He was very wasted; tongue red and smooth; knee, ankle, and biceps jerks not elicited. The ophthalmologist reported a paracentral scotoma. The patient was given hospital diet, with 6 compound vitamin tablets daily and 10 mg. of thiamine intravenously daily. Nine days after admission he suddenly became weaker in the legs, with gross ataxia of both arms and legs. Three weeks later there was only slight improvement.

CASE 2.—A bombardier, who on admission was grossly œdematous, with ascites and bilateral pleural effusions, severe anæmia, red smooth sore tongue, tachycardia, diarrhœa, and pellagrous skin lesions on the backs of the hands and forearms. After an initial general improvement he developed an empyema five weeks later. Thereafter his condition rapidly deteriorated and a well-marked angular stomatitis appeared. His skin and tongue continued to improve in appearance up to the time of his death.

AMBLYOPIA

Ocular deficiency symptoms appeared as early as four months after captivity. The average time was about a year, but some cases did not develop for more than three years. They were often unassociated with other signs of vitamin deficiency.

Photophobia and a burning sensation in and tiredness of the eyes were early symptoms. Supra- and retro-orbital headache was also present. Defective vision usually came on later. Blurring of letters and missing letters and lines when reading print, and failure to recognise faces, were noticed. Of the cases examined, about 13% had a vision of 6/60 or less in each eye, and the remainder 6/18 or less. Visual acuity was about equal in the two eyes.

Corneal and conjunctival sensation was normal, and the corneal changes which have been described in association with riboflavin deficiency were not seen by the

Royal College of Surgeons of England

At a meeting of the council held on Nov. 29, with Sir Alfred Webb-Johnson, the president, in the chair, the following resolution was passed:

> "The Council desires the Negotiating Committee to enter into discussions and negotiations with the Minister on the Regulations authorised by the National Health Service Act."

Sir Cecil Wakeley was appointed Bradshaw lecturer for 1947. Dr. Frank H. Lahey, of Boston, was appointed to deliver the first Cecil Joll lecture in September, 1947.

It was decided to publish a periodical containing news items and college lectures.

The Association Française de Chirurgie has given 50,000 francs to the college's rebuilding fund.

The council, having acceded to requests from the Royal Australasian College of Surgeons, from the medical faculty of the Egyptian University, Cairo, and from the Director-General of Medical Services in India to conduct the primary F.R.C.S. examination overseas, has appointed the following examiners for this purpose: Sir Heneage Ogilvie, Prof. B. A. McSwiney, and Prof. G. Hadfield. They are due to leave London on Dec. 8, and the examinations will begin in Cairo on Dec. 12, in Madras on Dec. 23, and in Australasia on Jan. 6. The examiners should arrive back in this country about the end of January. Altogether 224 candidates will be examined—32 in Cairo, 65 in Madras, 63 in Melbourne, 29 in Sydney, and 35 in Dunedin.

Royal Society

The following have been elected officers of the society for the coming year:

President, Sir Robert Robinson; treasurer, Sir Thomas Merton; secretaries, Sir Alfred Egerton and Sir Edward Salisbury; foreign secretary, Prof. E. D. Adrian, M.D.; members of council, Dr. C. H. Andrewes, M.D., Prof. W. T. Astbury, Prof. W. Brown, Mr. E. C. Bullard, Prof. A. C. Chibnall, Prof. C. A. Lovatt Evans, M.D., Prof. N. Hamilton Fairley, M.D., Prof. R. A. Fisher, Prof. S. Goldstein, Prof. E. L. Hirst, Prof. H. W. Melville, Prof. M. H. A. Newman, Prof. M. L. E. Oliphant, Mr. C. F. A. Pantin, Prof. H. H. Read, Sir Reginald Stradling.

The two royal medals for the year have been awarded to Sir Lawrence Bragg, F.R.S., for his researches in the sciences of X-ray structure analysis and X-ray spectroscopy, and to Mr. C. D. Darlington, D.SC., F.R.S., for his researches in cytology and genetics. The Copley medal has been awarded to Prof. E. D. Adrian, O.M., for his researches on the fundamental nature of nervous activity, and recently on the localisation of certain nervous functions.

Royal Sanitary Institute

The Benjamin Ward Richardson lecture will be delivered at the institute on Dec. 11, at 2.30 P.M., by Prof. Harold Burrow, whose subject will be Future Control of Abattoirs and Knacker Yards. At a sessional meeting in Warrington, at 10.30 A.M. on Dec. 13, Dr. S. F. Allison will speak on the Welfare of Old People, and Dr. J. E. Nicole on the Mental Health of the Elderly.

L.C.C. Mental Service

The following medical superintendents have now been confirmed in the promotions which they received on a temporary basis during the war: Dr. A. C. Dalzell, Friern Hospital; Dr. J. F. MacMahon, the Manor; Dr. L. T. Hilliard, Fountain Hospital; Dr. J. H. Watkin, Leavesden Hospital; Dr. Louis Minski, Sutton Emergency Hospital; Dr. A. B. Stokes, Maudsley Hospital.

Dangers of Raw Meat

The Ministries of Food and Health have circulated a warning against eating pork, pork sausage meat, ham, or any other pork product unless it has been thoroughly cooked. They also call attention to the dangerous practice of spreading raw sausage meat on bread; it will be recalled that this substitute for meat paste has been a potent cause of trichiniasis.

Certificates for Air Travellers

Doctors who give vaccinations and inoculations to intending air passengers are asked to use the "International Certificate of Inoculation and Vaccination" (Form 3150) when recording them. The forms can be obtained by the passenger from the agency from which he receives his ticket and flight information. The use of any other form may lead to delays and quarantine in foreign countries where only the international certificate is officially recognised.

Appointments

BEAL, J. R., M.D. Manc., D.P.H.; senior T.O., Northumberland.
COLBECK, J. C., M.B. Lond.: director of pathological and laboratory services, West Riding of Yorkshire.
DAVIS, H. S., M.B. Camb., M.R.C.P.: physician to outpatients Hampstead General and North-West London Hospital.
PETERS, H. J., M.B., B.HY. Durh., D.P.H.: M.O.H., Stockton-on-Tees
SMITHARD, E. R. H., M.D. Lond., D.P.H.: M.O.H., Lewisham.

Ministry of Health*:

Senior Medical Officer:

LILICO, G., M.B. Edin., D.P.H., M.O.H., Derby, recently seconded to UNRRA.

Medical Officers:

- BOUCHER, C. A., D.M. Oxfd, D.P.H., formerly A.R.P.M.O., Shoreditch, at present temp. M.O. at Ministry.
- GORRIE, MARY G., M.D. Glasg., D.P.H., regional M.O. for maternity and child welfare. Aberdeen and Kincardine, late temp. M.O. at Ministry.
- HERBERT, ANNE E. M., M.R.C.S., D.P.H., M.O., Welsh Board of Health.
- HIRST, KATHERINE M., M.B. Lond., D.P.H., deputy M.O.H., Islington.
- MACGREGOR, I. M., M.B. Glasg., D.P.H., A.M.O.H., Bristol, late colonel R.A.M.C.
- MANSON, MARGARET M., M.B. Edin., D.P.H., temp. M.O. at the Ministry.
- MARTIN, A. E., M.D. Manc., D.P.H., senior A.M.O.H., Leicestershire
- MURRAY, L. H., M.D. Durh., D.P.H., superintendent, Lanchester Joint Hospital Board, co. Durham.
- ROSS, J. M., M.B. Aberd., A.M.O.H., Lancashire, seconded as temp. M.O. to the Ministry.
- TAYLOR, I., M.B. Lond., M.R.C.P., D.P.H., divisional M.O., L.C.C.
- WINNER, ALBERTINE L., M.D. Lond., M.R.C.P., consulting medical practice, lieut.-colonel R.A.M.C.

* Appointments subject to confirmation

Examining Factory Surgeons:

- FOSTER, A., M.B. Glasg.: Port Glasgow.
- GAUNTLETT, E. G., C.B.E., D.S.O., M.B. Lond., F.R.C.S.: Braintree.
- GREEN, J. W., L.R.C.P.I.: Waltham Abbey, Essex.
- HENDERSON, A. G., M.B. Edin.: Arbroath.
- JACKSON, F., M.B. Manc.: Kirkham.
- LIDDELL, C. M., M.B. Aberd.: Peterculter.
- SULLIVAN, D., M.B. N.U.I.: Bilston, Staffs.
- WILLIAMS, R. E., L.M.S.S.A.: Godalming.

London County Council Central Medical Staff Assistant Medical Officers:

- COPITHORNE, R. E. C., M.R.C.S., D.C.H.
- MCKENDRICK, E. M., M.B. Glasg.
- MCMICHAEL, J. K., M.D. Edin.
- SUMMERS, F., M.B. Lond.

Colonial Service:

- CARUANA, S., M.B., B.SC.: M.O., Sierra Leone.
- CHARLTON, D. W. F., M.R.C.S.: M.O., Kenya.
- DAVIES, R. G., M.B. Lond.: M.O., Kenya.
- DUFF, A. R., M.B. Edin.: M.O., Uganda.
- EDDEY, L. G., M.B. Aberd., D.T.M. & H.: D.D.M.S., British Guiana.
- FURNESS, J. E., M.B. Lond.: M.O., Nigeria.
- GLASS, G. M., M.B. Belf.: M.O., Sierra Leone.
- ISAAC, R. H., M.R.C.S.: M.O., Malaya.
- JOYNER, C. M., M.B.: district M.O., Bahamas.
- LANE, J. P., M.B. N.U.I., F.R.C.S.: M.O., Tanganyika.
- MCADAM, I. W. J., M.B. Edin., F.R.C.S.: M.O., Uganda.
- RAPER, A. B., B.SC., M.D. Leeds, M.R.C.P.: M.O., Uganda.
- SCOTT, D., M.B.: M.O., Gold Coast.
- SCOTT, EDITH, M.B. Aberd., D OBST.R.C.O.G.: M.O., Nigeria.
- SMARTT, C. G. F., M.R.C.S.: M.O., Tanganyika.
- STECHER, S., M.D. Vienna: M.O. (grade C), Trinidad.
- STRUDWICK, R. H., M.B. Birm.: M.O., Nigeria.

Births, Marriages, and Deaths

BIRTHS

BROOK.—On Nov. 27, the wife of Dr. Bevis Brock—a son.
BUTLER.—On Nov. 26, at Buckhurst Hill, Essex, the wife of Mr. E. C. B. Butler, F.R.C.S.—a son.
CONWAY.—On Nov. 20, the wife of Dr. D. J. Conway—a daughter.
GRAY.—On Nov. 22, the wife of Dr. George Gray—a son.
HANBURY.—On Nov. 24, in London, the wife of Dr. Paul Hanbury—a daughter.
MALLOWS.—On Nov. 26, at Weymouth, the wife of Surgeon Lieutenant H. Russell Mallows, R.N.V.R.—a daughter.
SCHRYVER.—On Dec. 1, at Epsom, Dr. Nancy Richardson, wife of Peter Schryver—a son.

MARRIAGES

BRADY—AMBROSE.—On Nov. 26, in London, Surgeon Lieutenant Thomas Joseph Brady, M.R.C.S., to Margaret Mary Ambrose.
LONG—VLASTO.—On Nov. 28, in London, Aidan Long, M.B., to Helen Vlasto.
ROSE—MIETH.—On Nov. 28, in London, Louis Rose, M.R.C.S., to Jolanda Ingrid Gertrud Mieth.
TRINGHAM—SHERWOOD.—On Oct. 26, at Hong-Kong, Surgeon Lieutenant Robert Tringham, M.B., R.N.V.R., to Junior Commander Ida Seaman Sherwood, A.T.S.

DEATHS

GAMGEE.—On Nov. 27, Katherine Mary Lovell Gamgee, M.R.C.S. D.P.H.
HAYTHORNTHWAITE.—On Nov. 24, at Little Hayes, King's Langley, Herts, Izset Mead Haythornthwaite, L.R.C.P.I., aged 87.
HERBERTSON.—On Nov. 23, at Ferring-by-Sea, John Richmond Herbertson, M.B. Glasg.
HONEYMAN.—On Nov. 24, William Murray Honeyman, B.SC., M.B. St. And., M.R.C.P., squadron-leader R.A.F.V.R., aged 35.
IRVINE.—On Nov. 21, at Lewes, Sussex, Maurice Lionel Corrie Irvine, M.D. Lond., D.T.M. & H., lieut.-colonel I.M.S.

On admission (Sept. 12) he was emaciated. The skin was rather dry. He looked exhausted and spent most of the day sleeping. He said he felt ill and weak, especially in the legs and hands. Doing up his pyjama buttons was difficult owing to clumsiness of the fingers. He had a smooth magenta tongue. Pellagrous skin was seen round the ankles and knees, and on the backs of the hands. Extensor hallucis and peroneal muscles were very feeble on both sides; less severely affected were the extensor digitorum, tibialis anticus, quadriceps femoris, forearm extensors, and the grip on both sides. There was disproportionate wasting of the legs, thighs, and forearms. The muscles were hypotonic.

There was a minimal response to all tendon reflexes tested. Abdominal reflexes were not elicited. Sensation of pinprick was generally diminished, increasing peripherally. Below about the middle of the legs and below the elbows discrimination between sharp and blunt was lost. Heat and cold sense was lost in a band about 3 in. wide around the ankles. Joint sense in great toes diminished. Tendo-Achillis sensation reduced. Other systems: no abnormality found. Urine and blood picture normal.

He was given the ordinary hospital diet, with 6 compound vitamin and 6 'Benerva' tablets, nicotinic acid 200 mg., ascorbic acid 50 mg., and 'Vegamite' 3 drachms daily. He took his food fairly well and gained a stone in a fortnight.

Twelve days after the first examination he looked cheerful and well, his face had filled out remarkably, and he had put on muscle, especially about the shoulder girdle. He complained of unsteady gait; numbness, tingling, and clumsiness of the hands; and flatulence after meals. Other changes noted on re-examination were: improvement in power, well marked in the forearms, less so in the thighs, and slight in the legs; tendon reflexes all brisk; ataxia less (could now walk, though with a very drunken gait); loss of joint sense less; loss of sensation to pinprick increased; skin and tongue normal.

There were 2 cases (1 and 4) where severe ataxia developed in hospital.

CASE 4.—A male civilian, aged 54, had been interned since February, 1942. Shortly after release he noticed some numbness in the legs and hands. For several months he had had difficulty in reading.

On admission to hospital he was given the ordinary diet, and received every day 6 compound vitamin tablets and 150 mg. of ascorbic acid by mouth, and 50 mg. of thiamine intramuscularly. Nine days after this treatment began he suddenly found that he was unable to walk or write.

On examination general muscular weakness was found, increasing peripherally. Tendon and abdominal reflexes were not elicited. Plantar response minimal and flexor. Sensation to pinprick generally reduced; appreciation of sharp and blunt lost below right knee. Loss of joint sense of thumbs, right wrist, and great toes. Gross ataxia of arms and legs. Some pallor of the disks on the temporal side. Cranial nerves otherwise normal. Mentality and memory normal.

These 2 cases have some features in common with those described by Spillane and Scott (1945). The development of gross ataxia while on large doses of thiamine is of interest; similar observations have recently been reported by Clarke and Sneddon (1946).

PETECHIAL RASHES

Petechial rashes were seen in the most severe and least severe cases, and in patients who had been in hospital several weeks. The rash came on suddenly. The common situations were the forearms, round the shoulders, over the tibiæ, and on the back just below the shoulders. In most cases pinching or stroking the skin produced ecchymoses and linear petechiæ. This test was positive only in the affected regions. Hess's test was negative.

These rashes were not necessarily associated with anæmia, and in those cases where examinations were carried out neither the spleen nor the lymphatic glands were enlarged, and there was no abnormality of the joints, interdental papillæ, white-cell counts, clotting-times, or bleeding-times. The condition did not respond to large doses of ascorbic acid or of nicotinic acid. It usually lasted 8–14 days, and in a few cases relapsed once.

CARDIOVASCULAR DISTURBANCES

Disturbances of the cardiovascular system could be divided, according to the response to parenteral thiamine, into those which responded rapidly, those which improved in about 5–10 days, and cases of unexplained tachycardia which did not respond. The first group consisted of 2 cases only and these were the only patients who showed engorgement of the veins of the neck.

CASE 5.—A lance-corporal, aged 29, had had occasional swelling of the feet for two years. Three weeks before admission his feet became more swollen, and he had breathlessness on exertion, loss of appetite, and slight cough.

On examination he was dyspnœic at rest, with some cyanosis. Gross œdema of legs and feet; much ascites; basal congestion; and engorgement of neck veins. Pulse-rate 144 per min. (regular); blood-pressure 160/120 mm. Hg; heart much enlarged; gallop rhythm. Intravenous thiamine and digoxin begun.

Three days later there was no dyspnœa or cyanosis; œdema less; no signs of ascites; signs of small effusions at bases; no venous engorgement; pulse-rate 102 per min.; blood-pressure 130/84 mm. Hg; apex-beat had retracted 1 in.; gallop rhythm less definite.

CASE 6.—A male civilian, aged 35. Shortly after liberation his ankles began to swell. Three days before admission he felt well but awoke during the night with breathlessness.

On examination: dyspnœic at rest; cyanosed. Gross œdema of legs and feet; neck veins engorged. Pulse-rate 110 per min. (regular); heart enlarged; sounds of poor quality; diastolic murmur heard all over precordium. Intravenous thiamine begun.

Three days later there was no dyspnœa or cyanosis; œdema less; pulse-rate 98 per min.; apex-beat had retracted about 1 in.; sounds of better quality.

In the other groups tachycardia was a constant feature. It was sometimes accompanied or followed by altered heart sounds—a broadened or split first sound at the apex, and less often a split pulmonary second sound. A precordial systolic bruit was sometimes heard. In severe cases the apex-beat was commonly found outside the midclavicular line.

In the severely emaciated cases blood-pressure was usually subnormal. A few patients collapsed suddenly during apparent recovery. Here the blood-pressure *fell*, but it returned to normal in about half an hour, though the patient remained only partly conscious and looked extremely weak, with slate-coloured complexion and cold sometimes cyanosed extremities with contracted veins and arteries.

There were 3 cases in middle-aged men where collapse was associated with a pronounced rise in blood-pressure, in one case to 220/110 mm. Hg. They all recovered in 10–17 days. In 2 of these cases albumin and microscopic blood and hyaline casts appeared in the urine after the collapse, but disappeared in a few days. In the same 2 cases the apex-beat moved out to the anterior axillary line, and attacks of pulmonary œdema came on nightly. There was no engorgement of the neck veins, but œdema increased during the attacks. Both patients had received daily large doses of thiamine for more than two weeks before the attack. All 3 completely recovered.

In the commoner form of collapse, with subnormal blood-pressure, respirations were slow and shallow, except when there was œdema of the lungs.

Unexplained Tachycardia.—Among the 577 cases of malnutrition there were 58 cases of tachycardia which did not respond to thiamine and for which no cause could be found (*not all had chest radiograms taken*). Most of these cases had no history of recent sore throat, tropical ulcer, *or scrotitis*. There was no significant association between tachycardia and neurological signs (table I) nor between tachycardia and tropical ulcer (table II).

It therefore seemed unlikely that these cases of tachycardia were diphtheritic. There was often some pyrexia, ordinary methods of examination. In the most advanced cases the pupils were dilated and reacted sluggishly to light, and contraction was ill-sustained.

Ophthalmoscopic appearances included normal disks even in some severe cases; temporal pallor exceeding normal limits in most cases; and signs of complete optic atrophy in a few cases. In all the advanced cases and in some of the less advanced a central or paracentral scotoma was found.

A weakness in accommodation and premature presbyopia, without evidence of refractile change in the lens, were noted in many of these cases and in patients without amblyopia.

RIBOFLAVIN DEFICIENCY

Manifestations of riboflavin deficiency were transitory, lasting about 4–8 days. Angular stomatitis was the commonest; next came magenta tongue; and cheilosis was occasionally seen. These signs were usually present singly.

Except for a few cases in which signs appeared unexpectedly late, and then usually after an attack of malaria, dysentery, or some digestive disorder, nearly all were seen within the first fourteen days in hospital. A history of signs appearing shortly after going on to a diet of higher calorie and carbohydrate value was usual.

SKIN LESIONS

Hyperkeratosis was the commonest skin lesion seen. The most common sites were round the ankles, on the backs of the hands, and round the elbows and knees. Hyperpigmentation was often present but not excessive. Underlying erythema was not seen. Itching was commonly absent and never a prominent feature. In cases with much hyperkeratosis, diarrhœa was also present in about half, and a sore red tongue in about a third. On hospital diet and nicotinic-acid therapy (average dose 300 mg. daily) the skin lesions recovered in 10–21 days. Sore tongue and diarrhœa, when present, responded more rapidly than did the skin lesions.

Dry Skin.—A dry thin scaly skin was commonly seen in the most severe cases of malnutrition. The condition was most pronounced on the lower abdomen, thighs, and forearms; often a mosaic pattern could be seen. It responded very slowly to routine treatment and to large doses of nicotinic acid. In the few cases tried, an improvement followed the giving of a fat-soluble vitamin preparation.

Scrotal Lesions.—These were never seen alone but in combination with hyperkeratosis or dry skin. In some cases the scrotum was thickened, wrinkled, scaly, and hyperpigmented. In others the scrotum was reddened, with a translucent appearance, and was partly covered with scales; these changes were seen when the scrotum was distended with œdema fluid. Itching was common in both types of scrotal lesion.

TONGUE LESIONS

Lesions on the tongue were common during the first fourteen days in hospital. They could be classified as follows:

(1) *Sore tongues* were usually reddened, often at the edges and tip, less often all over. Diarrhœa and hyperkeratosis were sometimes present. The soreness responded to nicotinic acid in 4–10 days.

(2) *Pale atrophic tongues* were always associated with anæmia and responded slowly to treatment.

(3) *Red atrophic tongues* were also found in association with anæmia, and were occasionally painful.

(4) *Magenta tongues* were seen in riboflavin deficiency (see above).

NEUROLOGICAL FINDINGS

Neurological signs attributable to malnutrition were seen in 170 cases. Their association with amblyopia, tropical ulcer, and unexplained tachycardia (see below) was tested. The results are shown in table I.

Price (1946), discussing allied prisoners-of-war and internees, remarks that "jungle sores" were common among his cases and some of these were infected with the Klebs-Löffler bacillus, which had caused a peripheral neuritis. None of our cases swabbed was found to be thus infected, and there was no significant association between neurological signs and tropical ulcer, unexplained tachycardia, or amblyopia.

Clinical findings were extremely varied. When the onset was gradual, the neurological symptoms usually began with paræsthesiæ followed by increasing weakness in the legs. Loss of balance, especially in the dark, was sometimes noted. A sudden onset with much weakness in the legs developing within 24 hours was common. In most of these patients there was little or no complaint of weakness, though there was sometimes a history of previous weakness. On examination, absent or diminished ankle jerks, with or without areas of sensory loss to pinprick, commonly of glove or stocking distribution, were found.

TABLE I—ASSOCIATION OF NEUROLOGICAL SIGNS WITH AMBLYOPIA, UNEXPLAINED TACHYCARDIA, AND TROPICAL ULCER

—	Cases of severe malnutrition			Remarks
	Neurological signs		Total	
	With	Without		
Amblyopia—	%	%	%	
With	13 (*7·65*)	35 (*8·60*)	48 (*8·32*)	p–p′ = −0·95
Without ..	157 (*92·35*)	372 (*91·40*)	529 (*91·68*)	S.E. = 2·5221 Not signif.
Unexplained tachycardia—				
With	22 (*12·94*)	36 (*8·85*)	58 (*10·05*)	p–p′ = +4·09
Without ..	148 (*87·06*)	371 (*91·15*)	519 (*89·95*)	S.E. = 2·7457 Not signif.
Tropical ulcer—				
With	11 (*6·47*)	35 (*8·60*)	46 (*7·97*)	p–p′ = −2·13
Without ..	159 (*93·53*)	372 (*91·40*)	531 (*92·03*)	S.E. = 2·4731
Totals ..	170	407	577	Not signif

Physical examination of the more severe cases showed a dissociated sensory loss. Loss to touch was uncommon; the most extensive area found was a band about 4 in. wide round both ankles. Loss of discrimination between heat and cold was present in 4 out of 5 patients examined who had extensive loss of sensation to pinprick. In 3 cases the distribution was an irregular band round the ankles, and in 1 case a large area, roughly symmetrical over the anterolateral aspect of the lower half of the thighs and anterior aspects of the legs. Loss of joint sense and some ataxia were common. The legs were more often and more severely affected than the arms. Loss of sensation to pinprick was sometimes very extensive, and in 2 cases analgesia was present over the whole skin surface; both were patients judged to have well-balanced personalities and in whom no confirmatory hysterical stigmata could be found. Vibration sense was not tested. Loss of power was affected most commonly and most severely in the following muscles in descending order: peroneal group, flexor digitorum, tibialis anticus, quadriceps femoris, and flexor hallucis. Roughly speaking, in the legs and arms, the distal muscles showed weakness first. The affected muscles were hypotonic. Tendon reflexes were either normal, diminished, or absent.

CASE 3.—A civil policeman, aged 32, had been interned at Singapore in February, 1942. Eighteen months before admission to hospital he had noted pins-and-needles in the feet and hands, and weakness in the legs. Later he noted that he was unsteady on his feet and staggered in the dark.

Symptoms continued with intermissions until shortly after the capitulation, when the rice ration was increased. He then became unable to walk. From Sept. 9 to 12 he was given every day 40 mg. of thiamine intramuscularly and 6 compound vitamin tablets by mouth.

quate owing to shortage of drugs and lack of hospital accommodation.

It is therefore surprising that out of 577 cases of malnutrition, 39 of whom developed malaria in hospital, only 21 (3·6%) were recorded as having palpable spleens. This was commented on by several medical officers in charge of wards and splenic enlargement was specially looked for.

PULMONARY TUBERCULOSIS

Of 30 patients admitted with pulmonary tuberculosis, 28 had positive sputum, 25 had bilateral disease, 6 had clear pleural effusions, 1 had a tuberculous total pyopneumothorax, 4 had extensive tuberculosis of the larynx, epiglottis, and tonsillar regions. A few others had a mild chronic non-specific laryngitis.

Three cases were afebrile on a routine of being "up" for two hours daily; the others were all bed patients. The bed patients, classified according to the symptoms and the anatomical extent of the disease, consisted of 12 moderate cases, 6 severe cases, and 9 hopelessly advanced cases (4 of whom died in hospital).

Since the patients were to be evacuated within a week or two, no active collapse therapy was given, except in one case to refill a successful artificial pneumothorax initiated five months earlier in the camp hospital. The tuberculous pyopneumothorax and two of the effusions were aspirated, diagnostic puncture alone being carried out on the others.

These men all showed some malnutrition, but this improved rapidly on the routine treatment, despite the presence of tuberculosis, except in the most extensive cases.

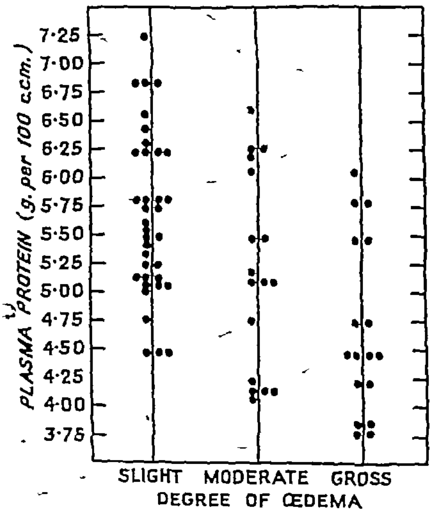


Fig. 1—Plasma-protein levels in 70 cases of œdema.

More than two-thirds of the cases gave a history of illness, referable to the chest, of less than nine months' duration, though the stage of the disease was, on the average, advanced. This suggests that malnutrition hastened the course of tuberculosis.

CAUSES OF DEATH

The causes of all deaths taking place between Sept. 9 and Nov. 30, 1945, were as follows:

Cause of death	*Cases*
Malnutrition and beriberi	8*
Empyema and malnutrition	1
Abscess of right thigh and beriberi	1
Effects of head injury and malnutrition ..	1
Cirrhosis of the liver and malnutrition .	1*
M.T. malaria and malnutrition	1
Intestinal obstruction and malnutrition ..	1
Pulmonary tuberculosis and malnutrition ..	4
Carcinoma of lung	1
Coronary artery thrombosis	1
Syphilitic aortitis	1

* Includes the 2 patients who died after plasma infusion.

Necropsies were made in all cases except 1 of malnutrition and beriberi and the 4 cases of pulmonary tuberculosis.

TREATMENT OF MALNUTRITION

Rest.—Patients remained in bed until ordered up by the doctor. This was not always easy to enforce, since after more than three years' captivity the men naturally wanted to be up and about. Slight œdema of the ankles, sore tongue, angular stomatitis, weakness of the legs, and residual signs of peripheral neuritis were not considered to be indications for rest in bed. The *nurses* were instructed to put to bed at once any patient found to have a rapid pulse. This was considered to be an important indication for rest in bed. Fever, worsening of the general condition, increasing signs of vitamin deficiency, diarrhœa, and dyspepsia were some of the other indications. Tachycardia at rest, breathlessness, palpitations, and precordial pain, a rising or falling blood-pressure, or any signs of collapse were thought to be indications for absolute rest.

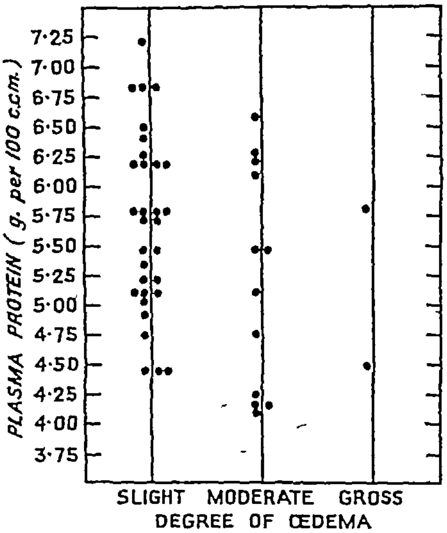


Fig. 2—Plasma-protein levels in 45 cases of œdema in which knee and ankle jerks were present.

Nursing.—An adequate and efficient nursing staff was looked upon as an important factor in the successful treatment of malnutrition. Secondary factors related to nursing efficiency, such as ward domestic staff, equipment, amenities, food-service, heating, lighting, and water-supply, were almost as important. If these were inefficient the sisters had less *time for the patients.*

At first a large proportion of the patients had diarrhœa, and some of these were incontinent. Bedpans had to be cleaned quickly, and there was no time for proper disinfection. No ill effects could be traced to this procedure. Bedding had often to be changed. In some wards tow and cotton-wool and sanitary towels were used to save bedding. Bedsores were the rule among the more severe cases. They were usually present on admission, but a few developed in hospital. Mouths needed a good deal of attention, for dry mouths with dry fissured tongue and dirty teeth were common.

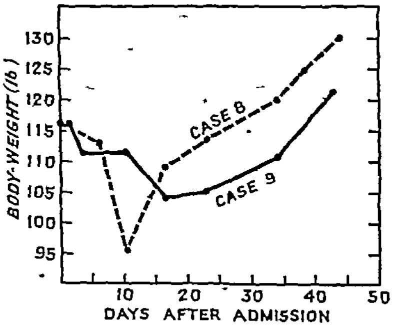


Fig. 3—Examples of initial loss of weight of œdematous patients on admission to hospital. Case 8's pre-war weight was 162 lb. and case 9's 152 lb. Initial loss of weight is due to loss of œdema fluid.

By Sept. 20 most of the wards were preparing milk drinks and could do simple invalid cooking in the ward kitchens. The graduated malnutrition diets I, II, and III (table III) were prepared in the wards. The severe cases required individual feeding. This was time-but no symptoms of fever. This form of tachycardia and pyrexia was not seen during the period of captivity in a hospital which served a camp holding on the average 12,000 men (E. K. Cruickshank, personal communication). Manson-Bahr (1945), however, remarks that an irregular pyrexia, seldom exceeding 100° F, has been noted in some epidemic outbreaks of beriberi. The tachycardia and fever often persisted though signs of vitamin deficiency disappeared or improved, and the patient put on weight and in every other way appeared to be progressing satisfactorily.

TABLE II—ASSOCIATION OF UNEXPLAINED TACHYCARDIA WITH TROPICAL ULCER

—		Cases of severe malnutrition		
		Tachycardia		Total
		With	Without	
Tropical ulcer	With	3 (*5·2%*)	43 (*8·3%*)	46 (*8·0%*)
	Without	55 (*94·8%*)	476 (*91·7%*)	531 (*92·0%*)
Totals		58	519	577

There was sometimes a history of breathlessness on exertion, or fatigue, and a few patients complained of attacks of faintness and palpitations. It was among such cases that the collapsed state, previously referred to, was liable to occur.

CASE 7.—A lance-sergeant, aged 35, was admitted as an ambulant case. He was very thin, with œdema of the ankles, and took his food well. Three days later his morning pulse-rate was 98 per min., and he was ordered to bed. During the afternoon, while walking, he had sudden severe dyspnœa and collapsed.

On examination half an hour later he was cyanosed, feebly fighting for breath, and coughing up watery sputum, with thready and irregular pulse, contracted veins, and cold extremities. Split first sound at apex. Except for left pectoral region, percussion note impaired at all areas; air entry greatly reduced; many bubbling sounds. Thiamine and nikethamide were injected intravenously, and oxygen was given. After half an hour his pulse and colour improved and respiratory efforts became more vigorous. Œdema developed rapidly up to the costal margins. Above the œdema he appeared dehydrated.

Next day he looked worse, being exhausted, with ashy complexion, and signs as on previous day. An hour later he was reported to be failing rapidly; but, when seen half an hour later, the difference in his appearance was striking. He was sleeping quietly, with normal colour, less œdema, and few râles at bases; tachycardia and altered heart sounds still present.

Six days later a relapse coincided with an attack of lobar pneumonia. He was treated with penicillin and recovered slowly.

ŒDEMA

In most cases œdema was postural, but in recently admitted patients pretibial œdema which was not postural was sometimes seen. The œdema which persisted was always postural. In the grossly œdematous the œdema often extended to the chest wall and was often accompanied by effusions into the knee-joints, ascites, and bilateral pleural effusions. A few cases of pericardial effusion were seen. Œdema often increased or appeared after admission to hospital. It was suggested that a normal salt intake following a long period on reduced intake was a contributory cause of this œdema. Œdema sometimes decreased during an attack of diarrhœa or a fever; occasionally it increased during a fever. Gross œdema was present in both cases showing venous engorgement (cases 5 and 6). Left ventricular failure sometimes developed in patients without œdema. In 3 cases albumin, microscopic blood, and scanty leucocytes and hyaline casts appeared in the urine, but the appearance was transitory and did not correspond with change in the œdema.

Plasma Proteins.—Total plasma-protein estimations were done in 70 œdematous cases (fig. 1). Though low readings were common in the grossly and moderately œdematous, and higher in the slightly œdematous, the levels were sometimes higher in the grossly œdematous than in the slightly œdematous. There was therefore no significant trend in the level of plasma protein with increasing degrees of œdema in these cases. This statement holds good for cases in which knee and ankle jerks were present (fig. 2). For diagnosis plasma-protein estimations, considered alone, seem to be of little value. The absence of any close relation between œdema and plasma-protein levels was also noted in cases of starvation in Europe (Mollison 1946). Unfortunately it was impossible to have serum-albumin and serum-globulin estimations done.

Loss and Gain of Weight.—Twenty-two patients, 6 of whom had slight œdema and 8 moderate œdema, were weighed at weekly intervals. In all but one the œdema was judged to be less or to have disappeared at the end of two weeks. The results were as follows:

Average weight (lb.)		*Average loss (lb.)*	*Average gain (lb.)*	
Before capture	*On admission*	*during internment*	*1st week*	*2nd week*
155	120	35	$5^1/_2$	5

In another series, where weight lost during internment was calculated from the lowest weight in hospital, the average loss was 41 lb. With more extensive œdema there was usually an initial loss of weight. Fig. 3 shows examples of this in cases 8 and 9.

DYSENTERY AND DIARRHŒA

Dysentery or diarrhœa was the reason for the admission of 87 patients to hospital. Besides these, 133 of the 577 cases admitted primarily for malnutrition had diarrhœa, and some of them were transferred to the dysentery ward. Of 115 patients from the dysentery ward 19 had amœbic dysentery; 1 amœbic hepatitis; 21 clinical dysentery; 18 infective diarrhœa; 49 dietetic diarrhœa; 3 giardiasis; and 1 colitis.

Some cases of amœbic dysentery were resistant to emetine; over the previous three years they had had ten or more courses of emetine.

Clinical dysenteries had blood and mucus in the stools, infective diarrhœas had not; both responded to sulphaguanidine. Dietetic diarrhœas often started soon after the increase in rations; they did not respond to sulphaguanidine, but did respond to restriction of diet. Several of these patients had sore red tongues and showed an initial improvement on nicotinic acid, but dietetic restriction was usually needed also.

Only one case of sprue was seen.

MALARIA

The incidence of the various types of malaria was as follows:

Type	*Admitted primarily for—*		
	Malaria	*Malnutrition*	*Other disease*
Benign tertian	32	20	1
Malignant tertian	7	3	0
Combined	1	1	0
Clinical malaria	28	15	1
Blackwater fever	1	0	0
Effects of malaria	4	0	0
Totals (114)	73	39	2

An attack of malaria in a patient with severe malnutrition was nearly always a cause for anxiety until the fever was controlled. In most cases progress from malnutrition was set back considerably and there was a loss in weight of half a stone and sometimes much more.

Many patients with and without malaria gave a history of repeated attacks of fever, some of which were proved cases of malaria. Sometimes treatment had been inade-

CASE 15.—This man was admitted to a camp hospital on August 16, 1945, with a diagnosis of beriberi and ulcers of the feet. Since then he had passed watery stools, about 18 daily, until Sept. 17, when the diarrhœa began to improve. He had had frequent attacks of flatulence and of feeling " blown up " after meals; this had become more severe since Sept. 17, and made him afraid to eat; previously he had been eating all his food.

On examination (Sept. 20) he was emaciated, with gross œdema, ascites, and bilateral pleural effusions. Mucosæ pale; tongue reddened at edges and tip. Pulse-rate 100 per min. Ankle jerks absent: areas of analgesia and paresis of legs with much hypotonia. Diarrhœa returned, and he had lost all desire for food.

After four days' of graduated diet the appetite had returned and the diarrhœa was considerably improved. He still complained of abdominal distension and discomfort, which was relieved by tapping the ascites.

Improvement continued until Oct. 8, when he had a further attack of distension and flatulence. The diet was reduced to less than 2000 calories, with relief of symptoms.

CASE 16.—Towards the end of July, 1945, this man had been admitted to a camp hospital as a case of beriberi and tropical ulcers. On August 20, 1945, there was a considerable increase in the diet. On the 25th he started passing frequent watery stools. After a course of sulphaguanidine there was some improvement. On Sept. 19 the diarrhœa became much worse and was accompanied by loss of appetite, flatulence, and distension.

On examination (Sept. 19) he was very wasted and mentally depressed, with extensive paresis and analgesia of legs and loss of knee and ankle jerks. Pulse-rate 118 per min. Blood-pressure 124/92 mm. Hg. Split first sound heard at the apex. Extremities cold. Petechial rash on forearms. Eight watery motions in the past twenty-four hours, appetite very poor; complained of acid eructations and distension.

After three days' graduated diet the dyspeptic symptoms had disappeared and the mental depression had gone.

CASE 17.—After a reduction in the camp rations in June, 1945, this man began rapidly to lose weight and complained of generalised weakness, especially in the legs. Later his feet began to swell. On August 1, 1945, he was admitted to a camp hospital. On the 20th the rations were considerably increased, and about a week later he complained of a sore tongue and diarrhœa, which had continued.

On examination (Sept. 20) he was emaciated, with dry and scaly skin, red and painful tongue. He was drowsy and apathetic. Some œdema of the ankles and signs of bilateral pleural effusions. Much generalised weakness. Loss of joint sense in great toes. Paresis of legs. Knee jerks absent. Much hypotonia of muscles. Tachycardia. Watery stools, 8 in the past twenty-four hours.

After three days' graduated diet 2 motions had been passed in twenty-four hours, appetite had returned, and mentality was much brighter.

These patients made satisfactory progress and were evacuated by hospital ship on Oct. 22.

Relapses following an initial improvement were common, but nearly always responded to further reduction in diet. It was easily possible to be misled by the patients' frequent demands for more food. Several patients succeeded in persuading the Chinese ward orderlies to buy them extra food, in spite of having been warned against overeating. One patient, who became severely ill and collapsed for no apparent reason, was found to have in his locker a large quantity of noodles and other forbidden food. He later admitted having eaten, earlier in the day, several large helpings of noodles.

In the following case the patient suddenly collapsed and died after an initial improvement. It was thought that the sudden increase in diet was a contributory cause of death.

CASE 18.—A man had had diarrhœa for ten weeks before admission. It began with flatulence and distension. During this period he gradually lost his appetite. Six weeks previously he noted in his right thigh a lump which gradually became bigger.

On examination (Sept. 19) he was extremely emaciated and lethargic. It took several minutes to rouse him sufficiently to answer questions; then he spoke very slowly in a monotonous voice. Face expressionless. Extensive dry hyperkeratosis of skin. Tongue and mouth dry. Slight œdema of ankles. Fluctulant swelling about 12 in. long in right thigh. Pulse-rate 80 per min. Blood-pressure 116/70 mm. Hg. Heart normal. Abdomen scaphoid. Pallor of temporal disks. No reaction to pinprick except over face. Tendon reflexes normal. Incontinence of fæces and urine. All food refused.

On Sept. 22 a Ryle tube was passed, and the graduated diet given through it. Pus was aspirated from the abscess in the right thigh and penicillin 200,000 units inserted.

Sept. 30: no incontinence; bowels opened 3 times in twenty-four hours; patient enjoying his food and talking to his neighbours; pulse-rate 120 per min.; temperature 102° F; no signs of abscess in the thigh.

The rapid pulse and fever continued until Oct. 3, when at 6 A.M., while being washed, he suddenly collapsed, dying five hours later.

At necropsy all the organs were small (heart 200 g., liver 850 g., kidneys 200 g., spleen 110 g.). The lungs were œdematous, and the mucosa of the stomach and intestines looked atrophic.

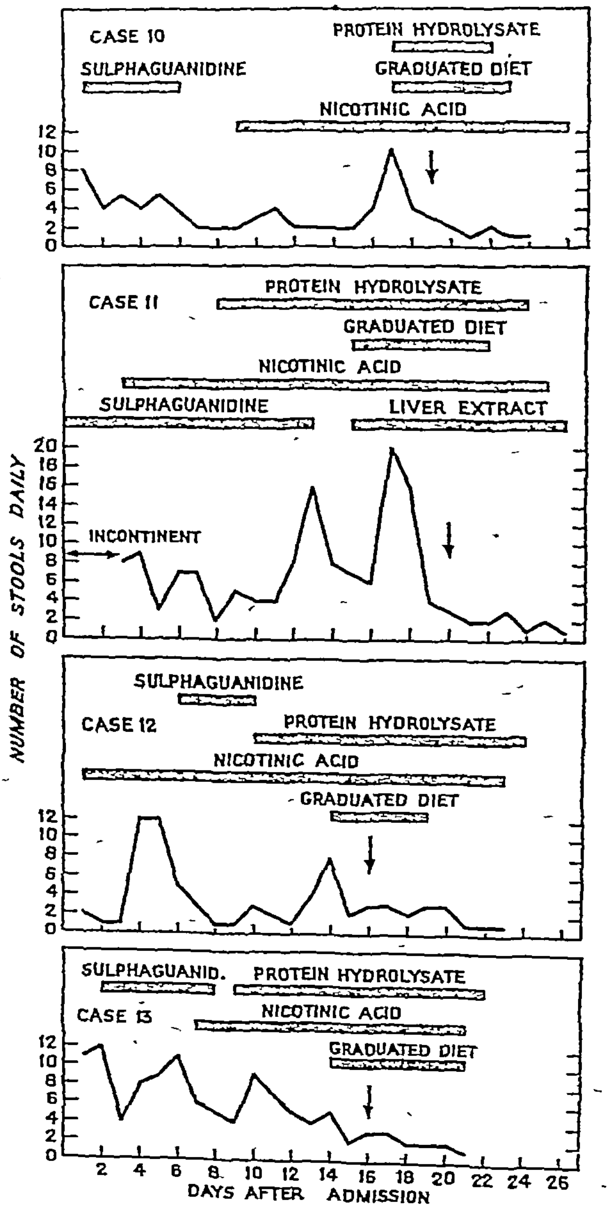


Fig. 4—Analysis of treatment in cases 10–13, showing that, of the different forms of treatment, restriction of diet bore the most constant relationship to improvement. (The vertical arrow marks the appearance of solid stools.)

TABLE III—GRADUATED DIETS FOR SEVERE MALNUTRITION WITH ANOREXIA AND/OR DIARRHŒA

Diet	Details and instructions	Total fluid (oz.) for non-œdematous cases	Total fluid (oz.) for œdematous cases	Fats (g.)	Carbohydrates (g.)	Proteins (g.)	Calories	Non-fat calories
I	Protein hydrolysate; give 3 oz. two-hourly for 7 feeds. For one day	31	21	0	30	15	180	180
II	Protein hydrolysate; give 4 oz. two-hourly for 7 feeds, each feed followed by egg-and-milk mixture. (Total daily milk mixture: condensed milk 1 pint, two beaten eggs, and 1 oz. of sugar; add $^1/_2$ pint of water for non-œdematous cases.) Continue until the appetite returns	57	47	60	134	76	1380	840
III	Egg-and-milk mixture three-hourly for 6 feeds. Rolled oats 2 oz., tinned fruit 2 oz., tinned chicken 4 oz. daily. (Total daily milk mixture: condensed milk $1^1/_2$ pints, two beaten eggs, and 2 oz. of sugar; add $^1/_2$ pint of water for non-œdematous cases.) Continue for at least three days	68	58	96	170	99	1940	1076
IV	Hospital light diet	80	60	136	412	128	3384	2160
V	Hospital ordinary diet	Ad lib.	Ad lib.	200	495	120	4260	2460

consuming, and during the rush period the sisters had little time for it. Some of the fitter patients and a few volunteer workers who became attached to the ward staff gave valuable help in this work. Fluid charts were often kept by the patient or by one of his fitter neighbours.

Diet.—In the case of the hospital ordinary and light diets (table III) four meals were served daily; and, between meals, milk drinks with biscuits, sweets, or chocolates were given. All patients were given 6 compound vitamin tablets daily. To patients with diarrhœa, the tablets were given as an emulsion. 'Marmite' or vegamite was given ad lib. to all patients except those few who disliked them.

Most of the mildly ill patients took these diets without any ill effects, but among moderately or severely ill patients disorders attributed to overfeeding were common. Except for the most severe cases with anorexia, a very large appetite, which was not satisfied by these diets, was the rule. It was evident that in some cases control of diet was important.

The graduated diets shown in table III were used in the severe cases or in cases where it was thought that symptoms were due to overfeeding. Some patients found these diets distasteful, but in those wards where something of the rationale of the treatment was explained to the patients there were no complaints and the best results were achieved.

Overfeeding was often followed by flatulence and abdominal distension, with or without diarrhœa. This usually caused considerable discomfort lasting from a few hours to a few days, but in the more severe cases the digestive disorder was sometimes accompanied by weakness and a rapid feeble pulse, and several cases of sudden collapse, with low blood-pressure, rapid pulse, cold extremities, and stupor were attributed to overeating.

TREATMENT OF DIARRHŒA

Some patients with diarrhœa improved rapidly after being in hospital for three or four days; some of these had signs of nicotinic-acid deficiency. Cases of severe diarrhœa or mild diarrhœa which did not improve within two or three days were treated with a kaolin mixture or sulphaguanidine. Wet-film examinations of stools were made, and any protozoal infections found received appropriate treatment.

Patients who continued to have diarrhœa (there were many such) gradually improved over a period ranging from about six days to four or more weeks. In these cases, if the diet was drastically reduced, or if the graduated diet was given, improvement usually took place in a few days. Some patients who were later diagnosed as having nutritional diarrhœa showed a transient improvement while taking sulphaguanidine.

Several forms of treatment were used simultaneously in nearly all the cases, so it was not always clear which had been responsible for improvement, unless treatment was analysed more closely. Fig. 4 shows cases 10–13 analysed from this aspect. It is fairly clear that restriction of diet bears the most constant relationship to improvement.

Severe Cases.—The presence of anorexia, lethargy, and diarrhœa demanded a great deal of nursing. The persistence and tact needed in persuading the patient to take his two-hourly feeds was often rewarded by the mitigation of these symptoms in three to five days. Later attention was directed to continuing absolute rest and restricting diet.

Illustrative Cases.—The following patients were treated in hospital for five to twelve days before being given the graduated diet. During this time they received compound vitamin tablets 6 daily, nicotinic-acid tablets 3–6 daily, parenteral thiamine 5–10 mg. daily, and a course of sulphaguanidine. They were on the hospital light diet but were reported as being very difficult to feed; the exact proportion of the diet taken during this time was unknown. In 2 cases there was a transient reduction in the number of daily motions while on sulphaguanidine, but over the period their condition had generally deteriorated. On Sept. 22 they were put on the graduated diet.

CASE 14.—A man with a year's history of weakness and numbness of the feet was admitted to a camp hospital on August 27, 1945, with great weakness of the legs and diarrhœa.

TABLE IV—RESULTS OF TREATMENT IN 40 CASES OF ŒDEMA

Treatment	Signs of neuritis	Good response	Delayed response	No response
No extra treatment	With	0	2	3
	Without	0	3	2
Thiamine 10–20 mg. daily parenterally	With	4	6	5
	Without	1	0	2
Thiamine as above and 'Neptal' 1 or 2 c.cm. given 2 or 3 times	With	5*	3	1
	Without	2	1	1

* The reduction in œdema in these 5 cases followed a profuse diuresis, which occurred soon after the giving of neptal.

On examination (Sept. 21) he was emaciated, drowsy, and apathetic, passing watery motions about 10 times daily. No appetite. Extreme general weakness. Knee and ankle jerks absent; areas of analgesia and partial paresis of legs, with much hypotonia. Mucosæ pale. Pale smooth tongue. Much œdema of legs. Signs of ascites, and bilateral pleural effusions present.

After three days' graduated diet there was much improvement. Appetite had returned, mentality was much brighter, and motions were semi-formed and reduced to 3 daily.

in general. Before its significance in this respect can be studied directly it is necessary to gain further information as to the nature of the stimuli which cause fibrinolytic activity in the living human subject. This paper records some preliminary attempts to identify the disturbing conditions which have this effect.

METHOD OF DEMONSTRATING FIBRINOLYTIC ACTIVITY

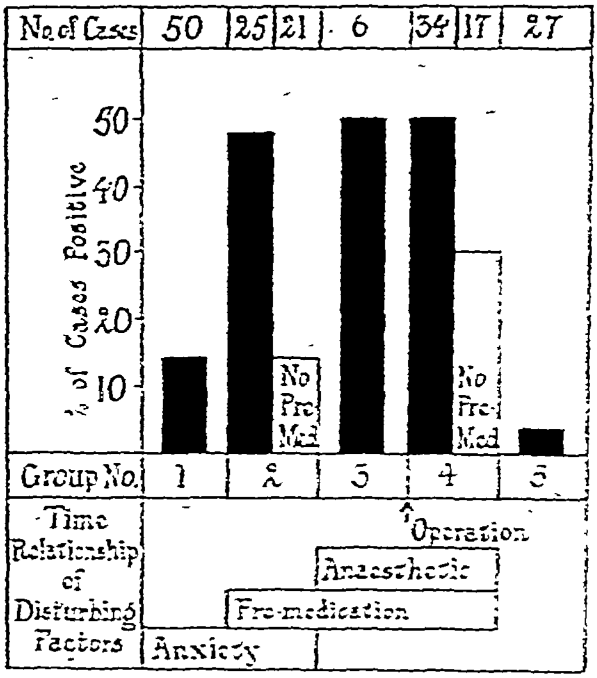
A modification of the method described by Macfarlane (1937) was used, which depends on the fact that dilution favours the dissociation of the normal plasma-antiplasmin (enzyme-inhibitor) complex, so that potential increases in activity not demonstrable in whole blood become apparent.

Blood was taken by venepuncture, mixed with a ninth of its volume of 3·8% sodium citrate, and spun at 2500 r.p.m. for 10 minutes. The plasma was separated and was then diluted 1 in 16, 1 in 32, and 1 in 64, using (*a*) 0·035% $CaCl_2$, and (*b*) 1/250 thrombin ('Clotting Globulin,' Lederle) both made up in the buffer-merthiolate-saline diluent already described (Macfarlane and Pilling 1946). The final volume of the dilutions was 3 ml. contained in Wassermann tubes which were incubated at 37° C. Clotting occurred rapidly in the thrombin preparations, and in a few minutes in the recalcified plasma dilutions, and in all was sufficiently firm to allow inversion without spilling, with the occasional exception of the 1/64 dilutions. After 24 hours' incubation the tubes were inspected for fibrinolysis, indicated by the disappearance of the clot. In general, the higher dilutions were more sensitive than the lower, and the thrombin-clotted plasma than the recalcified. A weak reaction would be indicated by lysis in the 1/64 dilution of the thrombin preparation in 24 hours, a strong one by the disappearance of fibrin in all six tubes in a few hours. In this paper, however, no attempt is made to analyse the results quantitatively, a positive result being recorded if all fibrin had disappeared from one or more dilutions within 24 hours.

RESULTS

A. *Normal Controls.*—It was necessary first of all to determine the results obtainable on normal blood by the method described, so 70 blood samples from 54 normal volunteers (students and medical staff) were examined. A weak positive reaction was obtained in the case of one student on one occasion: in all other samples no fibrinolysis occurred. In view of Willson and Munnell's (1946) observations relating to pregnancy, a large number (137) of normal pregnant women at various stages of gestation were examined; all were negative. In 4 normal volunteers blood taken during menstruation showed no fibrinolytic activity. From these findings it was considered that the method described is unlikely to give positive results under normal conditions.

B. *Patients Undergoing Surgical Operation.*—In previous studies of postoperative fibrinolysis too few blood samples were obtained from each patient to allow analysis of the possible effect of the various factors involved by a surgical operation. The most obvious of these are, in order of time, (*a*) the condition for which the patient is to be treated, (*b*) fear of the operation, (*c*) premedication, (*d*) anæsthesia, and (*e*) such results of surgery as trauma, shock, and hæmorrhage. In an attempt to analyse the possible effect of these multiple factors blood samples were taken (1) on the day before operation, (2) after premedication, (3) after anæsthetisation, (4) immediately after operation, and (5) on the following day, in a series of 34 patients undergoing operation for a variety of conditions. Not all blood samples were taken in all cases, but sufficient were obtained in each time-group to allow comparison of results, with the exception of group 3 in which only 6 cases were examined. In these 34 cases, 88 observations were negative and 36 positive. There was no apparent correlation with age or sex. The percentage of positive results in each group is indicated by the black columns of the histogram (see figure) related to the probable effective period of the factors under consideration. Group 1 also includes 18 patients of a second series described later.



Incidence of fibrinolysis in patients (1) the day before operation, (2) after premedication, (3) after anæsthetisation, (4) immediately after operation, and (5) the day after operation. The white columns refer to patients not receiving premedication.

It will be seen from these results that the occurrence of postoperative fibrinolysis is confirmed, 50% of positive results being recorded in group 4. A considerable proportion of patients showing fibrinolysis in this group, however, had undergone only the most minor physical trauma, such as cystoscopy, ureteric catheterisation, sigmoidoscopy, or injection of hæmorrhoids. A more remarkable finding, perhaps, is that the incidence of fibrinolysis is almost equally great in group 2, before the operation or anæsthetic, a result that invalidates any supposition that these latter factors are the major causes of postoperative fibrinolysis. Disturbances occurring during the preoperative period must be at least equally potent. Of the 17 patients giving positive postoperative results, 9 were also positive before operation.

The conditions for which the patients were treated did not appear to provide a likely explanation of these findings. No particular type of abnormality was associated with preoperative fibrinolysis, which occurred, in fact, in patients with complaints no more serious than ingrowing toenail, hæmorrhoids, or herniæ; in a man admitted for circumcision, and in a woman for an examination of the uterus that showed no abnormality. Moreover, 19 of the patients giving positive results in groups 1–4 were investigated on the day after operation and all had then become negative with the exception of one following circumcision.

The effect of *premedication* was next investigated. Of the patients examined in groups 2 and 3, 31 had received morphine (gr. 1/6–1/4) and atropine (gr. 1/100) except 4 who had received 'Omnopon' instead of morphine, a substitution that did not affect the incidence of fibrinolysis. In a further series of 21 patients, however, premedication was withheld, and the results for these in groups 2 and 4 are indicated in the histogram by white columns. It will be seen that, when premedication is omitted, there is a considerable reduction in the incidence

TREATMENT OF ŒDEMA

The response to treatment of 40 unselected cases of œdema is given in table IV.

After intravenous neptal a diuresis of 180 oz. or more of urine passed in twenty-four hours was fairly common. Diuresis following thiamine or intravenous plasma was sometimes accompanied by profuse watery diarrhœa.

Reconstituted Plasma Therapy.—Intravenous reconstituted plasma was given in a few cases of persistent œdema. On 3 occasions severe pulmonary œdema developed ; 2 of these cases were fatal. In 1 of the fatal cases double-strength plasma was given at the rate of a pint in twelve hours. In this case advanced cirrhosis of the liver and a pale flabby heart weighing only 160 g. were found at necropsy. The other fatal case received a pint of normal-strength reconstituted plasma in two hours, followed by 3 oz. of double-strength plasma given in two hours. Necropsy showed œdema of lungs and brain. The heart weighed 230 g., and the myocardium had a normal appearance. For several hours before death this patient was incontinent of urine and fæces, and passed large quantities of urine and watery stools ; during this time the subcutaneous œdema and ascites decreased appreciably.

In 2 very œdematous cases, where plasma-protein estimations were done before and after plasma infusion, the level fell though the œdema was less. In a third case, with very slight œdema, the plasma-protein level rose. Alteration in the albumin/globulin ratio would explain this apparent discrepancy.

Blood-transfusion was tried in some cases with severe anæmia, but was given up owing to the high incidence of reactions.

SUPPLEMENTARY TREATMENT

Nicotinic-acid tablets, each containing 50 mg., were used in patients with pellagrous dermatitis, sore red tongues, scrotal lesions, or diarrhœa. The dose given was 50–150 mg. three times a day by mouth, or 50–100 mg. three times a day intramuscularly. Nikethamide was also used in doses of 1 or 2 c.cm. twice daily intravenously.

There were no definite indications for giving ascorbic acid, but it was sometimes used—e.g., in patients with tropical ulcers and bedsores—in doses of 50–150 mg. three times a day by mouth.

Vitaminised oil, 1 drachm three times a day, and a proprietary preparation in capsules, each containing 4000 I.U. of vitamin A and 400 I.U. of vitamin D, were given to some patients with dry skins.

The average daily dose of sulphaguanidine was 14 g. daily.

Compound vitamin tablets, containing ascorbic acid 25 mg., nicotinic acid 10 mg., riboflavin 1 mg., and thiamine 1 mg., were often given with benerva tablets, which contained 1 mg. of thiamine.

Protein hydrolysate was given by mouth. It contained 2·5% amino-acids in 5% glucose solution.

The liver extract used contained the equivalent of $^{1}/_{2}$ lb. of fresh liver to the ounce ; the average dose was 1 oz. daily.

SUMMARY

This report deals with 1230 patients, most of whom were too ill to be evacuated in hospital ships. Their previous diet had been deficient, and they came from camps with a high incidence of disorders attributed to vitamin-B deficiency.

At least 577 were admitted primarily for malnutritional disorders. These disorders are described.

Notes on weight loss and gain, tropical ulcer, dysentery and diarrhœa, malaria, and pulmonary tuberculosis are recorded.

A summary of the causes of all deaths between Sept. 9 and Nov. 30, 1945, is given.

Good nursing was found to be the most important factor in treatment.

Though the great majority of mild and moderately ill patients could take the hospital ordinary and light diets without ill effects, the importance of controlling the diet in certain cases was emphasised. Careful dieting and individual feeding were the only effective measures in treating the most severe cases of malnutrition.

In the treatment of œdema some cases responded to thiamine. A further group of cases responded to thiamine and neptal. Other cases did not respond.

The giving of plasma and fresh blood (after cross-matching) was stopped owing to the high incidence of reactions.

The small number of deaths due to malnutrition out of a large number of dangerously ill patients reflects great credit on the nurses.

We wish to thank Major-General Sir A. Biggam and Col. (S. Musgrove, officer commanding the 47th British Gener Hospital, for their permission and encouragement in publishi this report ; those medical officers of the 47th B.G.H. whos coöperation facilitated the collection of the information whic appears in this report ; and Dr. D. D. Reid for his invaluab help with the statistical data.

REFERENCES

Bennet, J. (1946) see *Lancet*, i, 852.
Burgess, R. C., Cruickshank, E. K. (1946) see *Lancet*, i, 853.
Clarke, C. A., Sneddon, I. B. (1946) *Proc. R. Soc. Med.* 39, 357.
Laycock, H. T. (1944) *Brit. med. J.* i, 667.
Manson-Bahr, P. H. (1945) Manson's Tropical Diseases, Londo p. 425.
Mollison, P. L. (1946) *Brit. med. J.* i, 7.
Price, R. K. (1946) *Ibid*, p. 647.
Spillane, J. D., Scott, G. I. (1945) *Lancet*, ii, 261.

OBSERVATIONS ON FIBRINOLYSIS

SPONTANEOUS ACTIVITY ASSOCIATED WITH SURGICAL OPERATIONS, TRAUMA, &C.

R. G. MACFARLANE
M.D. Lond.
RADCLIFFE LECTURER IN HÆMATOLOGY, OXFORD UNIVERSITY ; CLINICAL PATHOLOGIST

ROSEMARY BIGGS
M.B. Lond.
GRADUATE ASSISTANT, DEPARTMENT OF PATHOLOGY

RADCLIFFE INFIRMARY, OXFORD

SEVERAL workers have observed that, in variou pathological states, human blood spontaneously develop fibrinolytic activity. Yudin (1936) found that clotte blood obtained after sudden death underwent rapi liquefaction. Macfarlane (1937), using diluted recalcifie plasma, observed fibrinolysis in the blood of about 75% of patients immediately after surgical operation, a findin confirmed by Imperati (1937), though he recorded th lesser incidence of 50%. Mole (1943), working with bloo from cases of sudden death, demonstrated fibrinolysi apparently due to a proteolytic enzyme, probabl identical with that studied by Christensen and MacLeo (1945) and which they have called "plasmin." Tagno et al. (1946) recorded fibrinolytic activity in cases o severe burns, hæmorrhage, and barbiturate poisoning Willson and Munnell (1946) have reported its occurrenc in toxæmia of pregnancy and during normal menstrua tion, but their technique makes it difficult to judge th significance of their findings.

From these observations it appears that fibrinolysis occurs in association with a variety of disturbances in which the common factor is obscure, unless it be covered by that ill-defined term, "shock." The phenomenon is almost certainly due to the proteolytic digestion of fibrin resulting from activation of plasmin, a component of the enzyme system existing in normal blood discussed in a previous paper (Macfarlane and Pilling 1946). The normal function of this system is at present unknown, but its activation under the conditions mentioned suggests that it may take part in the development of "shock" and its sequelæ, or in the reactio disastrous, and some patients are put to too much emotional strain during treatment. As we are well aware, this has a deleterious effect on the progress of the disease.

Apart from surgery, the great benefits of which we do not wish to decry, the very facts of diagnosis and subsequent segregation constitute a severe threat to morale. A long stay in hospital, involving perhaps many months of rest in bed, does not tend to reinforce confidence, and sometimes creates more problems than it solves. To these emotional stresses may be added domestic and economic problems. Long rest in bed is useless without a measure of mental serenity.

With these circumstances in mind we have attempted to assist patients over crises in their treatment by giving them amphetamine sulphate ('Benzedrine'). An adequate summary of the uses of this drug, together with its indications and suggested doses, is given by Bett.[2] Doses much larger than those which we have used can be given, and no ill effects have been found when amphetamine has been administered continually for two years or more.

Amphetamine is a powerful stimulant of the central nervous system, an action which it owes to its ability to increase cerebral respiration. It produces euphoria and allays depression and fatigue, the patient becoming more alert and conscious of a feeling of well-being and increased confidence. In doses of 15 mg. by mouth amphetamine has little or no effect in raising blood-pressure or pulse-rate, though larger doses have these effects, and individual idiosyncrasy has been reported.

The drug has been used in widely different conditions but apparently not in pulmonary tuberculosis. We have used it in two ways: (1) as a short-term policy during thoracoplasty; and (2) to encourage the depressed, apathetic, or over-anxious patient.

DURING THORACOPLASTY

CASE 1.—A very apprehensive man, aged 24, developed a large extrapleural effusion after apical thoracoplasty. This led to non-closure of the wound and pyrexia. Four-hourly injections of penicillin were started, but after two days the patient had a complete "nervous breakdown," weeping and shouting when the nurse approached to give an injection or dress his wound. He protested that he could not continue the treatment and wanted to be left alone.

A course of amphetamine sulphate was started, 5 mg. (1 tablet) being given at 8 A.M. (half an hour before breakfast) and at noon (half an hour before lunch). Two hours after the first dose the patient's attitude was completely changed. He became bright and cheerful and told the doctor on his round that he felt "perfectly well" and asked when he might be allowed up.

His injections of penicillin were started again without protest and continued for nine days, when his temperature had settled and his wound healed. Amphetamine was then discontinued. The patient was "graded up" after two weeks, and three months later was back at light work

CASE 2.—A highly introspective and dejected man, aged 26, had had a total left thoracoplasty for a chronic tuberculous empyema, but after two stages he developed a bronchopleural fistula and spread of disease to the right lung. He became morbidly depressed when told that a right artificial pneumothorax should be attempted before the final stage of his thoracoplasty.

Amphetamine sulphate was given, as in case 1, for three weeks with results so beneficial that the failure to establish a right pneumothorax in no way affected his feeling of well-being. After a period of rest, during which amphetamine was discontinued without reversion to his depressed state, the third stage was performed.

A second course of amphetamine, lasting two weeks, followed this stage. An extrapleural collection of fluid eventually communicated with the bronchopleural fistula, and the patient became greatly distressed when each morning he coughed up 5 or 6 oz. of foul-tasting material.

A third course of amphetamine was given for four weeks, and this enabled him to bear his troubles with fortitude. He continued to be cheerful and did not complain of his slow progress or of his long period of complete rest in bed. His appetite improved greatly, and he gained over half a stone in a month. He is still under treatment.

CASE 3.—A man, aged 20, who had extensive tuberculous tracheobronchitis and cavitation in his left lung, was treated by pneumonectomy after two years' conservative treatment in this hospital. Postoperatively he had three-hourly injections of penicillin (given prophylactically) and aspiration of the residual pleural effusion on alternate days.

On the ninth day after operation he complained of pain at the site of injection and began displaying concern at his continued pyrexia. He was well aware of the hazards of the operation. Amphetamine sulphate was given as in the previous cases and continued for two weeks. There was an immediate cessation of pain and apprehension and thence an uninterrupted convalescence.

CASE 4.—A man, aged 30, had a partial consolidation of the right upper lobe following anterior-stage thoracoplasty. He became extremely ill, apprehensive, and uncoöperative. Amphetamine, given as before, completely changed his outlook and secured his coöperation. After two weeks the acute process had subsided and he was prepared for, and even demanding, the completion of his surgical programme.

CASE 5.—A man, aged 43, was habitually depressed and introspective. Thoracoplasty was only considered feasible in the light of our experience with amphetamine. The drug was therefore given as a routine after the first stage. His postoperative mental outlook and physical "well-being" showed a great improvement on his preoperative condition, notwithstanding the development of a large extrapleural effusion.

In this group no toxic reactions were observed. The dose was moderate and the course short. Since we were concerned about the possible effect of the drug in preventing sleep, we gave a hypnotic at night as a routine in our early cases. This was found to be unnecessary, however, with a daily dosage of 10 mg. of amphetamine, as used in this series. In all cases there was, besides the euphoria, a considerable improvement in appetite, and pains, headaches, and minor complaints disappeared. The beneficial effects observed by us in this series suggest that amphetamine might have a much wider application in general surgery.

ENCOURAGEMENT OF OVER-ANXIOUS PATIENTS

CASE 6.—An intelligent and "highly strung" professional man, aged 53, lived in constant dread that he might need collapse therapy; and, when it became necessary to carry out phrenic-nerve crush, a general anæsthetic was needed. The pneumoperitoneum which followed produced a nervous wreck, though a reasonable control of the diseased area in the lung was obtained.

We would have abandoned the pneumoperitoneum immediately had it not been that the result of amphetamine (given as "vitamin tablets") produced a fundamental change in his reactions. He improved both mentally and physically. His spirits became buoyant and his outlook optimistic. His appetite improved and he put on weight. He continued weekly refills without demur up to the time of discharge. Amphetamine was given for two weeks in all.

CASE 7.—An ex-Service man, aged 35, had had dyspepsia four years before admission. This had been associated with the prospect of going overseas, and no somatic cause had been found. While overseas he developed palpitations and cardiac symptoms, which were described as "functional."

On subsequently developing tuberculosis he was sent into this hospital with a recommendation for thoracoplasty. He complained of severe pain centred over the area of disease (he had been informed of its situation) and dyspepsia. No cause for these symptoms could be found.

The onset of hæmoptysis in a nearby patient was the signal for an additional symptom. The patient said he could taste blood in his mouth and must be swallowing the results of his hæmoptysis. This again proved unfounded, and, after attempting to convince him of the truth, we recommended some "vitamins" as a general tonic. Amphetamine, given as in the previous cases, rid the patient of his fears, and he has since been transferred to the surgical block, where he awaits thoracoplasty with equanimity.

---

[2] Bett, W. R. *Post-grad. med. J.* 1946, 22, 205.

of fibrinolysis before, and to a lesser extent after, operation. In order to test the obvious conclusion that premedication induces fibrinolysis, it was applied to 8 subjects (volunteers and coöperative patients) without other disturbing factors. One volunteer showed signs of toxæmia with vomiting, and developed well-marked fibrinolysis; the other subjects remained negative.

A possible factor to be considered is the *fear* of an impending operation felt in varying degree by most patients. It is difficult to assess the extent of this agitation, since some patients are anxious to conceal it, but in at least 14% of patients before operation it seemed to be the only likely factor responsible for fibrinolytic activation. This conclusion, though of considerable inherent interest, reduces the value of the further investigations described (with extreme brevity therefore) below. It is now uncertain whether the results obtained were related to the mental or to the physical state of the patients.

C. *Accidental Trauma.*—Blood samples from 12 cases of accident were obtained before treatment, and a clinical estimate of the degree of shock recorded. Fibrinolysis occurred in 4 cases—2 of head injury with moderate shock, 1 of Pott's fracture with moderate shock, and 1 of a cut wrist with negligible shock. Two patients with severe multiple injuries and extreme shock showed no fibrinolysis.

D. *Miscellaneous Pathological States.*—No attempt was made to carry out a comprehensive survey, but, to gain preliminary information as to the incidence of fibrinolysis in disease, blood samples were examined from 90 patients undergoing routine pathological investigation. Of these, 11 showed fibrinolysis, and in the following conditions the figures in parentheses indicate the number of patients positive or negative in each category:

> Ulcerative colitis (2+, 3−); rheumatic carditis (1+, 1−); serum sickness (1+, 1−); nephritis (1+, 1−); cold agglutination associated with Raynaud's phenomenon (1+, 1−); toxæmia of pregnancy (1+, 5−); cirrhosis of liver (1+); lead poisoning (1+); urticaria (1+, 2−); iritis (1+).

All other cases were negative, including transfusion reactions, drug reactions, sepsis, tuberculous and other infections, peptic ulcers, rheumatoid arthritis, metabolic disorders, anæmias, and malignancy.

DISCUSSION

From the foregoing observations, no single factor or process emerges with any clarity as the activator of fibrinolysis.

The surgical and accident cases provide results showing that traumatic shock is not the major agent. This is borne out by the observations of Macfarlane (1937) and Imperati (1937), in which quite minor procedures were associated with relatively intense fibrinolytic activity. These previous investigations did not include the immediate preoperative period, a study of which in the present work has revealed the importance of preoperative disturbances as causes of fibrinolysis. One of these disturbances appears to be premedication. It has been shown that fibrinolysis was induced in a normal subject by morphine and atropine, though the particular subject seemed to be unduly sensitive to them. A similar sensitivity may partially explain the greater incidence of fibrinolysis observed in patients who received premedication as compared with those who did not, but in 7 experimental subjects no activation by morphine and atropine was observed. It would be unwise to attach much significance to the small number of positive results obtained in a miscellaneous group of pathological states, but the nature of the latter might suggest a condition of hypersensitivity as a possible common factor, though it must be remembered that in other cases of hypersensitivity negative results were obtained.

In the absence of any other obvious explanation it is reasonable to suppose that anxiety or fear may have been related to a proportion of the preoperative positive results. This supposition is supported by the observations of Latner (1946), who found fibrinolysis in a few normal persons during air-raids on London. If it is correct, the origin of fibrinolytic activity must be sought in the physiological responses to mental as well as to physical disturbances. This view, taken in conjunction with the other findings in the present and previous work, suggests that spontaneous activation of the proteolytic system of normal blood may be a part of the "alarm reaction" as defined by Selye (1946).

SUMMARY AND CONCLUSION

Fibrinolysis occurs not only after surgical operations but immediately before them in about 50% of cases.

The drugs used for premedication may be responsible for some cases of preoperative fibrinolytic activity.

Fear of impending operation appears to cause a further proportion of positive results.

Traumatic shock does not seem to be a major factor in determining fibrinolysis.

The activation of the proteolytic system of normal blood, almost certainly responsible for the phenomenon of fibrinolysis, may be a part of the "alarm reaction" of Selye.

Thanks are due to the surgeons and anæsthetists of the Radcliffe Infirmary whose ready coöperation has made investigation of these cases possible; to Miss E. M. C. Dyke for help in collecting samples; and to Mr. J. Pilling for undertaking much of the work in the laboratory. The general investigation of fibrinolysis is financed by the Medical Research Council.

REFERENCES

Christensen, L. R., MacLeod, C. M. (1945) *J. gen. Physiol.* **28**, 559.
Imperati, L. (1937) *Rif. med.* **53**, 1694.
Latner, A. L. (1946) Communication to Physiological Society.
Macfarlane, R. G. (1937) *Lancet*, i, 10.
— Pilling, J. (1946) *Ibid*, ii, 562.
Mole, R. H. (1943) personal communication.
Selye, H. (1946) *J. clin. Endocrin.* **6**, 117.
Tagnon, H. J., Levenson, S. M., Davidson, C. S., Taylor, F. H. L. (1946) *Amer. J. med. Sci.* **211**, 88.
Willson, J. R., Munnell, E. R. (1946) *Proc. Soc. exp. Biol., N.Y.* **62**, 277.
Yudin, S. S. (1936) *Pr. méd.* **44**, 68.

AMPHETAMINE IN PULMONARY TUBERCULOSIS

L. E. Houghton
M.D. Camb.

Fintan L. Corrigan
L.R.C.P.I.

From the County Hospital, Harefield, Middlesex

Contrary to popular belief, euphoria or spes phthisica is not often encountered during the active phases of pulmonary tuberculosis. The prevailing mood is commonly one of depression and over-anxiety.[1] The influence of personality is recognised by most clinicians as an important factor not only in the ætiology of many cases of phthisis but also in the prognosis of cases under treatment. Apprehensive, over-anxious, and introspective patients seldom do well. These factors are perhaps particularly important in view of modern developments in treatment which involve major surgical intervention, the patient very often associating successful treatment with major surgery. The patient who enters a modern sanatorium can no longer contemplate a period of tranquillity and freedom from personal anxiety, but must face a series of collapse-therapy measures beginning perhaps with phrenic-nerve interruption or artificial pneumothorax or pneumoperitoneum, and advancing, in the case of failure of these measures, towards the irreversible procedure of thoracoplasty. The effect of this protracted ordeal on apprehensive personalities is often ing blood and glucose-saline, was 9 pints; the estimated output, allowing for blood-loss, oozing from wounds, gastric suction, sweating, and respiration, was $4^1/_2$ pints leaving an excess fluid intake over output of $4^1/_2$ pints. During the second twenty-four hours the estimated excess fluid intake over output was 2 pints, the third twenty-four hours $1^3/_4$ pints, and the last twenty-four hours 1 pint.

---

[1] Some of the words and phrases used in this paper have a special meaning in psychiatric medicine. We have not used them in this sense.

Autopsy (nine hours after death).—There were no signs of jaundice. The subcutaneous tissues were œdematous and the blood rather watery. The lungs showed extensive œdema, a common terminal event in acute uræmias of this type, where intravenous fluids are administered after the kidneys have almost ceased to function. None of the tissues showed any sign of dehydration. The wounds in the stomach and jejunum were healing well, fluid passed readily along these viscera, which were not unduly distended, the colostomy was patent, and there appeared to be no obvious reason why the abdominal injuries should not have resolved completely.

The kidneys were swollen, their combined weight being 14 oz. (normal is $10^1/_2$ oz.). They showed no evidence of trauma. On section, the renal cortex was pale and swollen, with prominent glomeruli; the centres of the pyramids were pale, but the corticomedullary junction was clearly demarcated. The renal pelves showed small splashes of submucosal hæmorrhage. The bladder held about 1 oz. of reddish urine containing blood-pigments and albumin.

Microscopically the kidneys showed the characteristic changes of an acute nephrosis, such as is found in post-transfusion deaths, the principal features being bloodlessness of the glomerular capillaries, with swelling and increased cellularity of the tufts, and a tendency to clubbing; widening and increased tortuosity of the convoluted tubules, with flattening of the degenerated lining epithelium; reddish or brown finely or coarsely granular material in the tubules of Henle's loops; and a similar substance in the collecting tubules mixed with desquamated degenerated epithelial cells. The pigmented appearance of the casts was preserved in unstained sections.

Blood Examination.—In this case there was no real reason to believe that sulphadiazine was the cause of the uræmia. At no time were crystals of the drug found in the urine, and the case was predominantly one of hæmoglobinuria and not hæmaturia. From the time the first specimen of urine was examined we had reason to suspect the transfusion, and during life the following tests on the blood of the patient and the first three donors were carried out. (As the hæmoglobinuria preceded the last transfusion, the fourth donor is not considered here.)

(1) Blood-group of patient: group A_1, Rh positive.

(2) Patient's *own cells* mixed with his *own serum*: no hæmolysis or agglutination (*a*) at room temperature, (*b*) in refrigerator.

(3) Test *group-O cells* mixed with *patient's serum*: no hæmolysis or agglutination (*a*) at room temperature, (*b*) in refrigerator.

(4) Cross-matching with the three donors, group O: no agglutination between any of the three *donors' cells* and the *patient's serum*. During *reverse* cross-matching agglutination naturally developed between the patient's cells and the sera of the three donors, but in the case of the second donor this was very pronounced.

(5) *Agglutination-titre of the three donors' sera against the cells of three stock group-A and three stock group-B bloods.*

(i) α 1/256 β—1/128
(ii) α 1/4096 β—1/1024
(iii) α 1/512 β—1/128

(6) In view of the very high titre of α agglutinins in the serum of the second donor, this serum was mixed in a watch-glass with group-A blood in proportions approximating to the actual transfusion. Gross agglutination rapidly developed. The red-cell counts of the test blood before and after addition of the serum were 4,900,000/c.mm. and 2,450,000/c.mm.—i.e., allowing for slight dilution of the blood by the serum, nearly half of the red cells had been destroyed in the process. Controls with normal serum showed a drop of only 8% in the red-cell count, to be explained by the dilution.

DISCUSSION

The theoretical dangers of transfusing patients of other groups with universal donor blood containing high-titre agglutinins have long been recognised (Levine and Mabee 1923, Freeman and Whitehouse 1926, DeGowin 1937); and Gesse (1935) collected 46 post-transfusion accidents of this type (20 of which were fatal) from the literature, along with a case of his own where the group-O serum of the donor agglutinated the corpuscles of a group-A recipient in a dilution of 1 in 2048. Muller and Balgairies (1936) reported a case of shock following a transfusion of group-O blood with high α agglutinin titre to a group-A recipient. Riddell (1939) and Wiener (1943) both advise against giving group-O blood to patients of other groups when the agglutinin titre of the donor is high, but they do not specify at what titre the blood should be rejected.

Earlier papers show some difference of opinion, probably depending on the technique of titring, about what is the normal α agglutinin titre in group-O blood. More recently Aubert et al. (1942) examined 250 unselected group-O sera and found that in over 70% the titre ranged from 128 to 512, although exceptional titres of 8192, 16,384, and even higher were recorded. At no. 1 Base Transfusion Unit, M.E.F., where 1000 universal donors' bloods were titred, the average range was 64–256 (Buttle).

Aubert et al. (1942) describe an experiment in which they gave 450 c.cm. of group-O blood, with an α agglutinin titre of 16,384, to an anæmic patient: this was followed by mild intravascular hæmolysis but not by hæmoglobinuria. Similar experiments led them to conclude that "the transfusion of conscious recipients of group A (12 cases) with considerable volumes of group-O serum or plasma containing extremely potent anti-A iso-agglutinins did not produce any reaction which could be classed as dangerous." All showed some evidence of red-cell destruction in the recipient, however, with the symptoms, in some cases, of pain in the back, constricting sensations in the neck and chest, and intestinal colic and nausea; but the suggestion is made that these might be due to unidentified substances in the serum. However, they recommend that group-O blood with an α agglutinin titre of 512 upwards should be considered undesirable for transfusion purposes.

Various methods of demonstrating the "dangerous universal donor" have been described (Weil 1915, Rous and Turner 1915, and Coca 1918). The best of these appears to be that of Coca, somewhat modified by Levine and Mabee (1923). This test consists of mixing the donor's citrated blood, diluted 1 in 10 in normal saline, with the recipient's whole citrated blood. Dilution and mixing are performed in a white-cell counting pipette, and the reaction is observed on a glass microscope slide. A reaction is read as negative if no agglutination appears at the end of fifteen minutes. It is also possible to determine whether the recipient's or the donor's cells are agglutinated. In the former case nine-tenths of the cells are clumped, while one-tenth of them are free; in the latter case the reverse is found.

The absence of any post-transfusion reaction in our case is not necessarily significant. Wiener (1943) points out that, when the patient is under an anæsthetic, the symptoms may be unnoticed; and that, even when the patient is conscious, the first symptoms may be those of uræmia.

The histological appearances of the kidneys are not peculiar to transfusion deaths and have been described in fatal cases of blackwater fever, crush uræmia, sulphapyridine poisoning, and other conditions. A study of 30 kidneys from one or other of these conditions has led us to believe that the pigmented casts are the debris of degenerate desquamated tubular epithelium and not broken-down red cells, although the discoloration appears to be due to a hæmatogenous pigment. Often these casts affect less than 20% of the collecting tubules, and it is probable that degenerative change in the convoluted tubules, though less conspicuous histologically than the pigment casts, is a more important factor than mechanical blockage. This view conflicts with that of Baker and Dodds (1925) but is in agreement with recent papers by DeGowin et al. (1938) and Bywaters and Dible (1942).

CASE 8.—A trained nurse, aged 28, with disease in the right lower lobe associated with atelectasis, had been "difficult," uncoöperative, and emotionally unstable during her treatment in this and other hospitals. Her disease, in these circumstances, made little progress towards resolution, and collapse therapy was unhelpful. She became increasingly introspective and listless and finally became morbidly religious and prepared herself for her end. She made arrangements to return to her home in Ireland.

A course of amphetamine sulphate produced considerable but not dramatic improvement in her state of mind and in her physical well-being. Her temperature settled and she asked to get up. Previously she had feared to get out of bed in case she should have a hæmoptysis. She undertook bed occupational therapy for the first time.

Her passage to Ireland having been arranged, this patient could not be followed up. It was interesting that, as a trained nurse, she knew what treatment she was having, and anticipated and complained of sleeplessness. This was overcome with hypnotics.

CASE 9.—A woman, aged 31, had been diagnosed as tuberculous a few months after a confinement. On admission to this hospital she had fairly extensive bilateral tuberculosis. She complained of headaches and of bizarre symptoms, such as "burnings and tinglings in the head" and "rushing of water through the ears." She was depressed at being admitted to a sanatorium and did not think she would be able to continue treatment.

A course of amphetamine sulphate, given as before, produced some increase in nervous symptoms, and she complained of sleeplessness. The drug was therefore discontinued.

During the next three months the symptoms continued, and no organic cause could be found. A second course of amphetamine was started, and this time improvement was striking. She lost her symptoms, became cheerful and coöperative, and is at present running a football pool in the ward.

In this series the drug was given not to assist the patient over a particularly trying situation but to lessen the strain of a long stay in hospital and perhaps to reverse some of the tendencies which seem to be inherent in tuberculosis.

DISCUSSION

In a disease such as phthisis, where the interplay of psychosomatic factors has such an important bearing on the development and progress of pulmonary lesions and on rehabilitation, a safe drug which reinforces confidence obviously has a wide field. An objection to the use of a drug of the ephedrine group might have been its tendency to raise blood-pressure and produce tachycardia. But these are not among the physiological effects of amphetamine in moderate dosage. Again, interference with sleep might have been disadvantageous in a condition where rest is of paramount importance. In the first place, however, amphetamine, as used by us in small doses and administered in the morning, does not produce insomnia. On the contrary, by allaying fears and anxieties, it has tended to have the reverse effect. Hypnotics have only occasionally been necessary in our series. Moreover, amphetamine is not a physical stimulant, and its effect in promoting increased physical effort seems to be psychological. Probably amphetamine should be withheld from excitable patients. We have found it desirable not to tell the patient what drug he is having.

From the limited number of patients treated in this way it is impossible to draw conclusions or to define clearly the type of patient or the circumstances in which amphetamine should be used, but in our preliminary series the impression has been formed that it is valuable and apparently harmless.

SUMMARY

An account is given of the effects of amphetamine sulphate (benzedrine) on patients undergoing institutional treatment for pulmonary tuberculosis.

The drug appears to have a definite value, particularly during difficult phases of thoracic surgery and for the restoration of confidence in the depressed or over-anxious patient.

FATAL USE OF A DANGEROUS UNIVERSAL DONOR

A. D. MORGAN
M.B. Aberd.

GEORGE LUMB
M.D. Lond.

John Burford Carlill Laboratories, Westminster Hospital Medical School

THE following case illustrates a rare type of inco patibility in transfusing a group-A patient with blo from a group-O donor, where the high-titre seru agglutinins of the latter caused agglutination of t recipient's corpuscles, followed by hæmoglobinur uræmia, and death. Such incompatibility is not reveal by the standard cross-matching tests (donor's ce against recipient's serum) and was only brought to lig by subsequent titring of the donor's serum.

CASE-RECORD

A healthy soldier, aged 38, was wounded by a revolv bullet, which entered the body $1^{1}/_{2}$ in. below the right cost margin and made its exit through the left flank. The patie was admitted to a military hospital half an hour later, ful conscious. He vomited some dark blood, and at the same tin gas escaped from the entry wound. Pulse-rate on admissic 84. Blood-pressure 130/76 mm. Hg. He was catheteris before operation, and clear urine was obtained.

Operation.—Three-quarters of an hour after admission tl abdomen was explored through a left paramedian incisio 'Pentothal,' nitrous oxide, oxygen, and ether being us during anæsthesia. The bullet had passed obliquely throug the stomach, from left to right, producing two large woun of the lesser curvature, very ragged, and separated by a narro strip of gastric wall. This strip was divided, and the whol wound sutured in two layers. A second wound of the jejunum involving three-quarters of its circumference, was likewis sutured. A large wound of the transverse colon was expose the affected loop of bowel clamped off, and the afferent an efferent limbs gun-barrelled by a running suture, the clamp being left in situ.

During the operation one pint of glucose-saline was adminis tered intravenously, followed by two pints of blood. Afte operation a third pint of blood was given. All three dono were group O, the blood being cross-matched by the usu slide technique, with no suggestion of incompatibility. Durin the transfusions the patient was anæsthetised, and no untowar reactions were observed.

Progress.—Next day the patient was conscious but still i a critical condition, with a pulse-rate of 140 per minut Since admission he had had a total of 18 g. of sulphadiazin On the third day gastric suction and intravenous salines we continued, but the sulphadiazine was stopped. As the patie had not passed urine since the operation he was catheterise and 6 oz. of dark brown turbid urine was withdrawn.

Laboratory Reports.—Hæmoglobin 85%. Urine aci pH 5·3; albumin +++; urobilin +; benzidine reactio +++; deposit of much amorphous material, with *only* a occasional red cell; sulphonamides present but *no* crystals i deposit. Conclusion: slight hæmaturia, gross hæmoglobinuri

By the fourth day the general condition was unchange Pulse-rate 120–140. Only 6 oz. of urine was withdrawn b catheter, still containing large amounts of albumin an hæmoglobin. A further pint of blood was given, with glucos saline containing 100 c.cm. of 4·3% sodium sulphate to th pint. During the taking of blood for estimation of urea th surgeon noticed that the red cells appeared to settle abnormall quickly. *Laboratory report:* blood-urea 223 mg. per 100 c.cm

On the fifth day a purpuric rash appeared, the patient wa mentally confused, and his general condition had deteriorate The total urinary output for the day was $3^{1}/_{2}$ oz. withdraw by catheter. *Laboratory report:* urine clearer in colour strongly alkaline; albumin +++; benzidine reactio +++; sulphonamides present, but no crystals in deposit.

Later in the day he was cystoscoped, and both renal pelve were washed out with normal saline. The colostomy wa active, the pulse-volume good, the pulse-rate 100–120; bu during the last three days only 17 oz. of urine had bee obtained, by catheter or cystoscope. The patient becam more and more deeply unconscious and died the same night 100 hours after his injury.

Fluid Balance.—The fluid intake and output were estimate daily. The intake during the first twenty-four hours, includ-

10 mm. constitute a negative reaction. A control test with saline should be done. As Naterman and Robins (1942) point out, these skin tests do not accurately reflect drug sensitivity, but at least serve as a rough index. In the ocular test both eyes are first inspected, and then one drop of 35% diodone is placed in one eye, the other eye acting as a control. The patient is instructed to close his eyes, and they are then observed at $1\frac{1}{2}$ and 3 min. A positive reaction consists of injection of the conjunctival and scleral vessels.

As a final safeguard, before the full injection of diodone, 2 c.cm. is given intravenously, and the patient is observed for untoward effects over the next 2 or 3 min. Adrenaline solution 1 in 1000 is kept at hand ready loaded in a syringe.

If there is no significant reaction to these tests, the patient is given morphine gr. $\frac{1}{4}$ and transferred to the X-ray department. A blood-pressure cuff is put in place just above the knee of the more affected leg. Under 2% procaine local anæsthesia the saphenous vein is then exposed at its termination as in the Trendelenburg operation. A main tributary of the saphenous vein is isolated and the needle introduced into it. The patency of the infusion system and the resistance to injection are then tested by injecting a little warm saline. This is followed by the final test dose of 2 c.cm. of 70% diodone. Before the rest of the diodone is injected, the pressure in the sphygmomanometer cuff is raised above the venous pressure in the limb, so that during the injection there shall be less dilution of the diodone with venous blood from the leg. To this precaution we attribute in part the fact that the veins show up with adequate contrast in the radiograms, though the rate of injection is considerably slower than that usually recommended in angiographic work. With a 50 c.cm. Luer-Lok syringe containing about 30 c.cm. of 70% diodone and an 18 B.W.G. needle, 20 c.cm. is injected in as many seconds. This rate is approximately maximal under these conditions, for not only are the bores of the needle and vein small but also there may be the additional resistance of an extensive bed of tortuous collateral vessels. Radiographic exposures are made at 5, 15, 25, and 35 sec. after making the injection, which is maintained at the rate of 1 c.cm. per sec. The optimal shadow is likely to be obtained in the films taken after 10–20 sec. As long as 3 sec. is taken for each exposure at 78 kilovolts and 60 milliamps with an anode height of 42 in. The films are taken with a Potter-Bucky diaphragm.

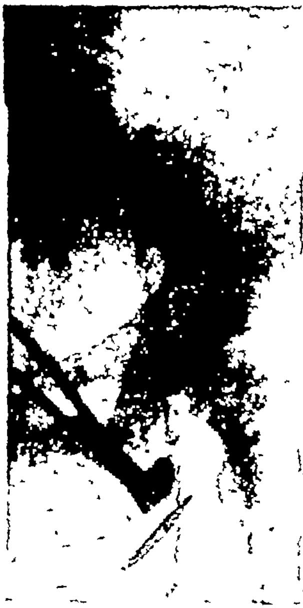
Since no more than a tributary of the saphenous vein is used for the injection, the main saphenous trunk is not sacrificed, only the tributary being doubly ligated before the needle is withdrawn. There have been no untoward complications from the procedure, and it has not been thought necessary to keep the patient in hospital for longer than one night. Contra-indications to this method of phlebography are the presence of severe renal or hepatic disease and sensitivity of the patient to diodone.

CASE-RECORDS

CASE 1.—A tailor, aged 43, had had attacks of numbness and cramp in the left leg for two years. During that time a fine network of superficial veins appeared on both thighs. There had been no œdema, nor had the varicosities extended on to the abdomen.

On examination he was well developed and rather obese, with no abnormal signs except the prominent veins already noted. These veins were not more than 1–2 mm. wide, and no larger veins were visible, even after the application of a tourniquet. The arteries in the lower limbs were normally palpable, but the left leg was colder than the right. There was no œdema.

In view of the fact that the symptoms, which might have been of vascular origin, appeared at the same time as the abnormal visible veins, it was thought worth while to investigate the venous return from the left lower limb by phlebography. Only 35% diodone was available at the time, but 30 c.cm. of this injected into the left saphenous vein was sufficient to demonstrate that the external and common iliac veins were patent as far as the inferior vena cava, with no visible collaterals (fig. 1).


1

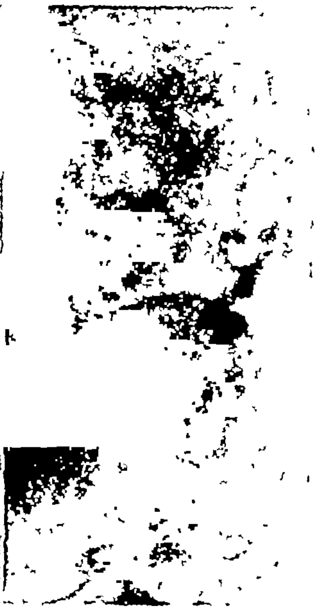

2

Fig. 1—Diodone solution (35%) was injected into a tributary of the left saphenous vein and can be seen coursing up external and common iliac veins. No collateral vessels visible.

Fig. 2—Diodone concentrated solution (70%) was injected into the left saphenous vein. None of the diodone can be seen in the iliac veins or inferior vena cava. There is a large tortuous collateral, probably the inferior epigastric vein. The opacities in the region of the ilium represent injections of bismuth.

CASE 2.—A Belgian woman, aged 54, had had attacks of pain in the upper abdomen since childhood, recurrent jaundice for seven years, periodic enlargement of the abdomen for four and a half years, and varicose veins on the legs and trunk for three and a half years. She had contracted syphilis thirty-five years previously, and her blood Wassermann reaction was still positive.

The varicosities had appeared first in the right leg and later in the left leg, and had spread up both legs, appearing at the same time in the groins and sides of the abdomen and lower chest, both anteriorly and posteriorly. The only symptom attributable to the distended veins was a burning pain in the left leg, and this was the immediate reason for her last admission to hospital.

On examination she was a rather plump vivacious woman apparently in fair health. Temperature, pulse-rate, and blood-pressure were normal, and, apart from the varicosities, the only signs of disease related to the liver. The liver-edge was palpable 2 in. below the right costal margin in the mid-clavicular line and felt firm and irregular. The spleen was doubtfully palpable, and there were no signs of free fluid in the abdomen. The palms of the hands were flushed, and a few spider telangiectases were seen. Liver-function tests showed only minimal impairment. The blood-flow in the varices was chiefly towards the heart, though the venous valves were partly incompetent. There was no caput medusæ, and the only site of œdema was the left ankle, where it was slight and of the chronic brawny type.

Syphilitic cirrhosis of the liver was diagnosed. The question then to be settled was whether the abdominal varices were secondary to the cirrhosis and possible portal obstruction, or whether, besides the cirrhosis, there was an independent obstruction of the inferior vena cava. The distribution of the abdominal varices, mainly along the flanks and at the groins, favoured the intrinsically less likely double diagnosis. This question was definitely settled by the phlebogram (fig. 2). The injected diodone was absent not only from the inferior vena cava but also from the external iliac vein on the side used for injection. The main channel for the venous return was a large tortuous vessel, probably the inferior epigastric vein.

It is of interest that the varicosities first appeared in the right leg in case 2, because in the development

It is fortunate that transfusion accidents of this type are very rare, in view of the difficulty of preventing them. In our case the α *agglutinin titre* of the second donor was 4096, an extremely high figure; and dilution by the recipient's serum did not prevent agglutination of the recipient's own corpuscles. Yet, by the ordinary cross-matching technique (donor's cells against recipient's serum) the blood appeared to be compatible; and, as the α agglutinins of any group-O donor will cause *agglutination of group-A cells on a slide*, the reverse cross-matching test (donor's serum against recipient's cells) is nearly always omitted. Indeed, the only way in which such incompatibilities can be anticipated is by the method of titring the donor's serum in every case. However, where large numbers of universal donors are employed in blood banks, it appears desirable to accept only those with *agglutinin titres below a certain arbitrary level.* The titre of 256 for α seems to be the upper limit of safety.

SUMMARY

A patient with group-A blood died after transfusion with group-O blood containing exceptionally high α agglutinins.

The clinical, post-mortem, histological, and serological findings are described.

The value of titring donors' sera is discussed in relation to the rarity of such accidents.

Our thanks are due to Colonel G. H. Haines for permission to publish the case, and to Miss S. Hartoch for technical assistance.

REFERENCES

Aubert, E. F., Boorman, K. E., Dodd, B. E., Loutit, J. F. (1942) Brit. med. J. i, 659.
Baker, S. L., Dodds, E. C. (1925) *Brit. J. exp. Path.* 6, 247.
Buttle, G. H. (*personal communication*).
Bywaters, E. G. L., Dible, J. H. (1942) *J. Path. Bact*, 54, 111.
Coca, A. F. (1918) *J. Immunol.* 3, 93.
DeGowin, E. L. (1937) *J. Amer. med. Ass.* 108, 296.
— Warner, E. D., Randall, W. L. (1938) *Arch. intern. Med.* 61, 609.
Freeman, G. C., Whitehouse, A. J. (1926) *Amer. J. med. Sci.* 172, 664.
Gesse, E. R. (1935) *Dtsch. Z. Chir.* 245, 371.
Levine, P., Mabee, J. (1923) *J. Immunol.* 8, 425.
Muller, M., Baignairies, E. (1936) *C.R. Soc. Biol. Paris*, 121, 1447.
Riddell, V. H. (1939) Blood Transfusion, London, p. 51.
Rous, P., Turner, J. R. (1915) *J. Amer. med. Ass.* 64, 1980.
Weil, R. (1915) *Ibid*, p. 425.
Wiener, A. S. (1943) *Blood Groups and Transfusions*, Springfield, pp. 60, 120, 121.

THROMBOSIS OF THE INFERIOR VENA CAVA

TECHNIQUE FOR ITS DEMONSTRATION

J. M. STOWERS
M.B. Camb., M.D. Harvard, M.R.C.P.
TEMP. ASSISTANT, MEDICAL UNIT

M. E. GROSSMAN
M.D. Prague, M.R.C.S., D.M.R.E.
FIRST ASSISTANT, X-RAY DIAGNOSTIC DEPARTMENT

UNIVERSITY COLLEGE HOSPITAL, LONDON

THROMBOSIS of the inferior vena cava is usually regarded as an incidental happening, often difficult to diagnose with certainty and, in any case, of little more than academic interest. Recent investigations, however, reveal not only that it is commoner than is realised but also that it may *be of practical* importance and call for intervention.

Pleasants (1911), in a review of 314 cases, has classified its causes in the order of frequency: neoplasms; puerperal sepsis; typhoid, tuberculosis, and scarlet fever; disease of liver; trauma; localised infections; and congenital obstruction. He concluded that the obstruction was usually recent when detected, and most often took place *in the* distal inferior vena cava and spread up from the iliac veins.

The type of case which is most susceptible to treatment, and therefore most important to diagnose, is a *spreading* thrombophlebitis or a phlebothrombosis, the latter being, according to DeBakey et al. (1943), a form of thrombosis which develops without much, if any, associated inflammation to fix the thrombus. In such cases ligation of the inferior vena cava is claime to save life by combating pulmonary embolism an sudden extension of the thrombus to both renal vein (Whittenberger and Huggins 1940).

The first reported therapeutic ligation was done b Trendelenburg in 1911 in a case of puerperal sepsis wit thrombosis (Pfaff 1926). After the operation there was dramatic improvement in the septic condition.

Krotoski (1937), who collected 48 such cases, conclude that ligation of the inferior vena cava and ovarian veins we the treatment of choice for pelvic thrombophlebitis.

Collins et al. (1943) reported on 8 cases so treated and had one death in a patient already moribund before operation They consider that ligation of the *inferior vena cava lowers* th mortality as compared with other operative procedures, and *that delay in operation or over-conservatism is dangerous.*

Gaston and Folsom (1945) reported 2 more successful cases both of whom had had *pulmonary emboli from the lower limbs*

The principle of proximal ligation in the treatmen of venous thrombosis in the limbs is gaining ever mor authoritative support (Ochsner and DeBakey 1941 and b) and seems to apply with equal force to cases wit venous thrombosis in the pelvis, so long as th *appropriate* ligation *is not too severe an operation.*

Ligation of the inferior vena cava does not produc more than slight disability, and this only in a few cases.

Wakefield and Mayo (1934) reviewed 19 cases of ligatio of the inferior vena cava; 15 patients survived the operation 2 of the deaths being regarded as due to the operation the *ligature* cutting through the vein on the twenty-thir day after operation in one case, and in the other case the ligature being tied above the right renal vein. This was therefore not *an instance of simple ligation. Of the survivin* patients 5 had persistent œdema of the lower extremities, 3 *had transitory* œdema, and 6 had no œdema. The observation that none developed visible collateral circulation was significant, though it is not known in what proportion of cases, if any, the inferior vena cava was recanalised.

Burch and Winsor (1943) reported *an interesting* post-operative physiological *study of patients* after ligation of the inferior vena cava: the elimination of water from the body was unaffected; the venous pressure in the legs was increased after the operation but *tended to approach normal* after time; and, though persistent postoperative œdema might be *present, erythema, petechiæ, pallor, paræsthesiæ, hyper*æsthesia, and tenderness were absent, and arterial pulsation *were much diminished.*

Northway and Greenway (1944) have suggested tha the unpleasant sequelæ *in the lower limbs* after thrombosi of the inferior vena cava can be reduced by combinin ligation with lumbar sympathectomy. This suggestio is based on the view of Homans (1941), Leriche an Geisendorf (1939), and Ochsner and DeBakey (1939 1940, 1941a and b) that in femoro-iliac thrombosi trophic changes in the legs are due to vasospasm, whic can be abolished by sympathectomy.

Hitherto investigation has been hampered by th difficulty of diagnosing *cases in the acute stage,* whe alone treatment might be of use. *It* therefore seem worth while to record a reliable *method of* diagnosin thrombosis of the inferior vena cava and its immediat tributaries at any stage of its development.

TECHNIQUE

The method consists of injecting a solution *of diodone,** a radio-opaque substance, into the saphenous vein nea its junction with the femoral vein, *and making* radiograms during and immediately *after the injection.*

Sensitivity to diodone should always be tested eithe by the intradermal method (Naterman and Robins 1942 or the ocular method (Robins 1942). *In* the intraderma method 0·05 c.cm. of 35% diodone *is injected* into th skin of the flexor aspect of the forearm. *This* normally produces a weal 2–4 mm. in *diameter.* A weal measuring less than 8 mm. and an erythematous area of less than

---

* Diodone concentrated solution (70%) supplied by Messrs. May and Baker Ltd., who also gave technical advice about its use.

Vitamin Therapy—its uses and limitations

PREGNANCY

WITHOUT COMPLICATIONS

An increasing number of mass experiments such as that of the People's League of Health in London, which involved observations on over 5,000 women, and the Toronto Survey, which was on a rather smaller scale, have demonstrated beyond question the desirability of supplementing antenatal diet with the essential protective factors. The practice of the war years in this respect has contributed to the drop in the maternal mortality rate (including abortions) from 3.10 in 1939 to 1.92 in 1944 and to a decline in the sepsis rate which is described in the report of the Chief Medical Officer of Health as "remarkable."*

For such supplementation of pregnancy diets, the best preparation is the one whose formula is based upon the gap between average normal diets and optimal requirements.

PREGNAVITE

A single supplement for safer pregnancy

The recommended daily dose provides :

vitamin A	4,000	i.u.	vitamin E ..	1.0 mg.	iodine	not less than 10 parts per million
vitamin D ..	300	i.u.	nicotinamide	25.0 mg.	manganese	
vitamin B_1	0.60	mg.	calcium ..	160.0 mg.	copper	
vitamin C ..	20.0	mg.	iron ..	68.0 mg.		

**References—Shortage of space precludes list of references, but full documentation may be obtained on application to Clinical Research, Dept. I.B.*

Product of Vitamins Limited

UPPER MALL, LONDON, W

of the inferior vena cava it is the right longitudinal dorsal venous channels which become incorporated into the renal and postrenal segments of the inferior vena cava and are therefore not available as collaterals if this vessel is obstructed (Keen 1941).

SUMMARY

A technique is described for demonstrating the patency of the inferior vena cava.

The possible practical importance of such a demonstration is indicated.

We are indebted to Mr. P. Brand and Mr. R. H. Shephard for supervising the operative procedures, and to Mr. J. M. Kenny for his assistance in the radiographic work.

REFERENCES

Burch, G. E., Winsor, T. (1943) *Proc. Soc. exp. Biol., N.Y.* **53**, 135.
Collins, C. G., Jones, J. R., Nelson, E. W. (1943) *New Orleans med. surg. J.* **95**, 324.
DeBakey, M. E., Schroeder, G. F., Ochsner, A. (1943) *J. Amer. med. Ass.* **123**, 738.
Gaston, E. A., Folsom, H. (1945) *New Engl. J. Med.* **233**, 229.
Homans, J. (1941) *Ibid*, **224**, 179.
Keen, J. A. (1941) *Brit. J. Surg.* **29**, 105.
Krotoski, J. (1937) *Chirurg.* **9**, 425.
Leriche, R., Geisendorf, W. (1939) *Pr. méd.* **47**, 1301.
Naterman, H. L., Robins, S. A. (1942) *J. Amer. med. Ass.* **119**, 491.
Northway, R., Greenway, G. D. (1944) *Univ. Hosp. Bull.* **10**, 67.
Ochsner, A., DeBakey, M. (1939) *Surgery*, **5**, 491.
— — (1940) *J. Amer. med. Ass.* **114**, 117.
— — (1941a) *Tri-State med. J.* **13**, 2054.
— — (1941b) *New Engl. J. Med.* **225**, 207.
Pfaff, O. G. (1926) *Amer. J. Obstet. Gynec.* **11**, 660.
Pleasants, J. H. (1911) *Johns Hopk. Hosp. Rep.* **16**, 303.
Robins, S. A. (1942) *Amer. J. Roentgenol.* **48**, 766.
Wakefield, E. G., Mayo, C. W. (1934) *J. Mo. med. Ass.* **31**, 92.
Whittenberger, J. L., Huggins, C. (1940) *Arch. Surg., Chicago*, **41**, 1334.

Medical Societies

SOCIETY OF MEDICAL OFFICERS OF HEALTH

IN his presidential address to the fever group in London on Nov. 8. Dr. WILLIAM GUNN spoke on the use in the last twenty years of

Human Blood Derivatives for Transfer Immunity

With gains in knowledge of plasma and serum, he said, difficulties tended to increase rather than diminish. The loss of serum's protective potency with age, appreciable in less than a year even when stored at 4° C and largely due apparently to the presence of denaturing enzymes, had been countered by freeze-drying in vacuo, whereby further loss was probably averted. Since preservatives tended to interfere with the drying process, various substances had been tried, and phenol, originally selected as the one of choice, was still used because it has the best all-round antiseptic action; the time taken in drying was only slightly prolonged, provided that the ratio of the total volume to the surface area was kept low. A 5% solution was used, to make a final concentration in the serum of 0·5%; the only disadvantage was that in higher concentrations than this phenol caused coagulation of the proteins. After the solution was added, 5 ml. of the contents of the ampoule (always to be preferred to a rubber-capped bottle) corresponded to only 4·5 ml. of actual serum—a point almost invariably overlooked by clinicians in the estimation of dosage.

In some 20,000 administrations no proved case of homologous serum jaundice had been encountered; but the long incubation period and the difficulties of follow-up in a large area such as London must be remembered. In recent years donors had been supervised for 4–5 months after withdrawal of blood, but sub- or non-icteric hepatitis remained a possibility which even repeated blood-counts and van den Bergh tests might fail to bring to light. There was still no conclusive evidence that antiseptics, or drying, or even heating to 57° C for four hours, as had been done on specially stabilised gamma-globulin, was effective in neutralising the causative agent in homologous serum jaundice; probably the complicated physico-chemical processes which take place in the separation of plasma-proteins into their constituent fractions alone sufficed.

Experience had shown that the adjustment of dosage, strictly by age or weight (*such as* 0·1 ml. per lb. body-weight for gamma-globulin), was not entirely satisfactory; at ages below 1 year and above 3 years the prophylactic dose against measles tended to be flattened compar with that in the relatively susceptible 1–3 years grou at least in London and other large centres of populatio Furthermore, it was not easy to administer the exa dose, especially in fractions of a millilitre, to a struggli child; if protection was imperative, the average do must be exceeded.

Rubella serum had been collected for preventio among women in the early months of pregnancy, bu the appropriate dose had not yet been fixed; it probabl lay between 10 and 20 ml., depending on the interv between the date of exposure and time of injection Preliminary trials had shown the protective titre to b rather lower than that usually found in measles serum possibly because the infection stimulus was less intens The gamma-globulin fraction would naturally be muc more effective—approximately 25 times more poten as had been shown in trials of mumps convalescent seru by Gellis, McGuinness, and Peters in 1945.

Reviews of Books

Aids to the Diagnosis and Treatment of Venere Diseases

T. E. OSMOND, M.B. Camb., honorary consultant venereal diseases to the Army. London: Baillièr Pp. 138. 5s.

THIS is a new volume in the "Students' Aids" serie Venereal diseases were formerly dealt with as a sectio of dermatology, but the subject has enlarged so muc and—as the author says in his preface—has so little i common with diseases of the skin, that it has bee decided to separate the two subjects. Dr. Osmon writes clearly and well, and gives a comprehensive out line of modern teaching in the short space at his disposal Inevitably the matter is condensed, but there are fe gaps. There are some omissions, such as reference t the skin rashes which may complicate sulphonamid therapy, and to the important evidence that post arsphenamine jaundice may result from faulty sterilisa tion of syringes and needles. Some of the author views will not be generally accepted. He states, fo instance, that healthy seminal vesicles cannot be felt b the examining finger, and implies that rectal stricture may result from gonococcal proctitis. For those wh require to revise under pressure, or those in practic who need a handy and accessible guide to first principle this book should prove very useful.

Motor Disorders in Nervous Diseases

ERNST HERZ, M.D., instructor in neurology, College Physicians and Surgeons, Columbia University, Ne York; TRACY J. PUTNAM, M.D., professor of neurolog and neurological surgery at the college. London Oxford University Press. Pp. 184. 20s.

Dr. Herz and Professor Putnam have made te teaching films of the disorders of movement which ma be found with lesions of the nervous system. This litt book has been compiled to supplement the cinemat graphic demonstration, and there is no doubt that t whole constitutes a contribution to the teaching neurology. The book is freely illustrated from the fil and from standard anatomical works; but without t dynamic presentation of the films it loses nearly all t authors have to offer. Patients with parkinsonis hemiplegia, facial palsy, or ophthalmoplegias can readily be seen and examined that strips of cinemat graph film can hardly offer anything new to the studen and it is so easy to show a student how to elicit a tend jerk that pictures of it appear unnecessary. The seco half of the book, dealing with motor disorders of t cranial nerves, is more interesting, but even here t knowledge gained is fragmentary, for the sensory fun tions of the nerves are omitted. The book by itself h little to offer for those with access to patients; the boo and the films together will help to drive home clinical lesson

---

A Primer for Diabetic Patients, by Prof. Russell M. Wild (Philadelphia and London: W. B. Saunders. Pp 192. 9s. has usefully gone into a sixth edition to meet the nee of the vast numbers of diabetics who are treated an guided to health at the Mayo Clinic. Diet, insulin test and the way of life are clearly explained.

THE LANCET
LONDON: SATURDAY, DEC. 14, 1946

Origins of Child Care

Our child-health services have a wide territory to cover—antenatal care and midwifery, infant consultations, nursery schools, health visiting, the school medical service, care of the child in sickness, his protection from neglect and exploitation, care of the unwanted child, and youth organisations. Prof. Richard Ellis, in his recent inaugural lecture in the department of child life and health in the University of Edinburgh, reviewed the beginnings of these services against the background of the ndustrial revolution. It is instructive but saddening to see how often an advance in the care of children has followed a shock either to the public conscience or to more sensitive private consciences. Captain Thomas Coram, ashamed to see the numbers of dead babies thrown on dunghills, got a royal charter for the establishment of the Foundling Hospital; Lord Shaftesbury and Dr. Barnardo worked tirelessly for the protection of destitute and exploited children; Dr. William Farr, under the auspices of the Obstetrical Society of London, showed that between half and three-quarters of the confinements in the country in 1869 were in the hands of untrained midwives; the trials of Margaret Waters and of Mrs. Dyer revealed that the mortality of infants entrusted to baby farmers was between 60 and 90%; the low physical standards of the young men recruited for the Boer War stimulated the development of the school medical service; the O'Neil case provoked the Curtis report. It is therefore comprehensible that the child-health services today "are not," as Professor Ellis said, "a neatly designed and constructed pyramid with a Minister perched like Athena's owl on the summit," but are more like a vast rambling country house.

> "By far the oldest structure is the block now labelled Central Administration. Antiquarians have discovered traces of Saxon workmanship in the foundations devoted to local government, while the Norman oubliette is still in constant use for the disposal of troublesome memoranda. An orphan presenting himself at the door may find himself the responsibility of any one of seven ministries or of more than seventy voluntary organisations. While the Lords of the Admiralty, the War Office, the Royal Air Force, and the Ministry of Pensions usually know which babies it is their privilege to hold, the Ministry of Health, the Ministry of Labour, and the Home Office appear to be in some doubt."

He believes that no future child-health programme can be efficient until the whole system of divided and ill-defined responsibility has been overhauled.

The greatest influence for good on the health of the older child, Professor Ellis holds, has been not a health service or doctor, but the late Lord Baden-Powell, who "had the vision to see that there was a place for a non-military, non-political youth organisation," designed to encourage an open-air life, independence and initiative, service to the community, and the fundamentals of good citizenship. His scheme makes these principles attractive to boys, and canalises their natural interests during the "gang age." The growth of the scout and guide movements, with their membership of five million, is evidence of Baden-Powell's grasp of the needs of youth. Several advances in the care of children have been the outcome of wars: the evacuation of Basque children during the Spanish war taught us lessons which were valuable when British children were sent to reception areas; and the verminous condition of many of those children gave a new impetus to the child-care services. The pædiatrician, in fact, must interest himself in more than the care of the sick child. Child health, Professor Ellis pointed out, is closely related to social and economic conditions—which may depend on international policies and upheavals—and to education in citizenship; and the pædiatrician, like an Eastern deity, must have hands to spare for the obstetrician, the general physician, the parent, the educationist, the child psychologist, the youth leader, the juvenile employment bureaucrat, and all workers in preventive and social medicine. Nor should he be afraid to help in shaping the social policy of the community in which he works. He is one of a team approaching the same goal: that the sick child should be healed, the destitute child cared for, and every child have the chance of a happy healthy childhood with training in citizenship.

Bacterial Motility

The student of elementary bacteriology traditionally wastes an hour or two of his practical class-work in attempting to stain the flagella sported by motile micro-organisms, and he can rarely have hesitated when asked the function of these appendages. Yet now Pijper,[1] who has for many years been observing bacteria under dark-ground illumination, makes the claim, well supported by argument and illustration, that, so far from being the organs of locomotion, the flagella are the result of this process. By special methods of cultivation it is possible to grow organisms which are motile but lack flagella. In Pijper's view the single or multiple "tails" seen by staining or other means are composed of the slimy substance that surrounds many bacteria, especially when young, and appears, in the pneumococcus for example, as a capsule. It is the motion of the organism that causes the capsular substance to trail out behind, like the tattered gown of a scholar rounding the corner of Balliol on a March morning. The faster the motion the longer is the tail. How then do motile bacteria progress? Direct observation is difficult owing to the speed of movement. Pijper overcame this obstacle by suspending the organisms in methylcellulose, an inert substance sufficiently viscous to slow down the movement so that it could be observed directly and by cinematograph. He found that motile organisms progress by spinning on their long axes while their bodies are bent in a slight spiral curve—much as does the rubber "sand-eel" used by pollack fishermen. The classical shape of the cholera vibrio is, in fact, an exaggerated example of that of all motile bacteria.

If these views are accepted some long-standing questions relating to bacterial motility are solved.

---

[1] Pijper, A. *J. Path. Bact.* 1946, 58, 325.

PROLONGED CONTACT *antiseptic*

During a systematic investigation into the antibacterial activity of the monoaminoacridines, 5-aminoacridine emerged as an antiseptic having properties similar to those of proflavine 'Flavogel' (5-aminoacridine) is the Glaxo preparation of this potent antiseptic in a water-miscible jelly base for use on cuts, wounds and protective dressings, etc. 'Flavogel' is valuable also as an antiseptic lubricant for catheters, cystoscopes, and specula, and in ante-natal examinations. 'Flavogel' has a powerful antibacterial activity, is effective in the presence of serum and is prolonged in action. The consistency of the jelly base maintains the antiseptic in contact with the tissues enabling it to exert the maximum antibacterial effect 'Flavogel' is ready for application direct from the tube. It is convenient to carry, clean to use and does not stain skin or clothing.

'Acramine' (5-Aminoacridine) is available also as a powder for making up solutions.

FLAVOGEL

Manufacturers of Penicillin

5-Aminoacridine Hydrochloride in water soluble jelly base 1-oz. tubes and 9-oz Jars.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

B.D.H. CONTRAST MEDIA

for use in X-ray Diagnosis

IODATOL—Iodised Oil B.P.
For the usual purposes for which iodised oil is generally employed, *e.g.*, bronchography, hysterosalpingography, localisation of cord tumours etc.

SHADO-CREAM and **SHADOFORM**—Preparations of Barium Sulphate B.P.
For oral or rectal administration in X-ray visualisation of the gastro-intestinal tract.

PHENIODOL B.D.H.
For oral administration as Pheniodol Meal B.D.H. in cholecystography.

T.I.P.—Iodophthalein B.P.
For those radiologists who wish to continue to practise the older method of cholecystography T.I.P. is still available in forms suitable for intravenous and for oral administration.

IODOXYL B.D.H.—Iodoxyl B.P.
For intravenous pyelography and arteriography.

Further information will be supplied on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

X-Ray/E/24

should be considered potentially though not necessarily dangerous in a child. In adults daily doses up to 25 mg. (1,000,000 I.U.) have been given, sometimes with ill effects and sometimes without. Some adults get toxic symptoms and reversible renal impairment after taking 5 mg. a day for several months, while others on the same dosage escape. **Dowling** and **Prosser Thomas**[5] think that there will be no great risk of serious sequelæ with the maximal dosage they employ in lupus—150,000 I.U., or 3·75 mg., daily—though anorexia and depression were noted in a fifth of their patients. It seems best to make it a rule, as **Freeman** and his colleagues[6] suggest, that in patients receiving large doses of vitamin D for more than a few days a careful watch should be kept for a rise in serum-calcium or incipient failure of renal function, which should be the signals for immediate reduction n dosage. Moreover, it must be borne in mind that n calciferol treatment there is an initial exacerbation f local disease, which may be dangerous. It should e widely known that the most concentrated vitamin-D reparations are not suitable for self-medication, and ven under medical supervision should not be dministered in large dosage for trivial ailments.

Annotations

RELAPSING BENIGN TERTIAN MALARIA

Critical appraisement of new drugs for the treatment of malaria is by no means the simple matter it might at first appear. At least a decade and a half elapsed before the merits and the limitations of mepacrine were properly appreciated, and it was only under the stimulus of war in the tropics that real progress was made. This stimulus led to intensive search for new antimalarial drugs, among which 'Paludrine' takes a high place. Although it is generally agreed that in most respects paludrine is superior to any of the drugs previously in common use, this drug is not the complete therapeutic answer to the malaria problem. Its outstanding merits are the remarkable range of doses effectively arresting clinical attacks of benign tertian (B.T.) and malignant tertian fever, and its freedom from toxicity or undesirable side-effects.[1] That it will prevent or eradicate a *Plasmodium falciparum* infection has been amply demonstrated,[2] but its ability to sterilise the more chronic and resistant *P. vivax* infections is still unproved. A report by Dr R. D. C. Johnstone in our last issue records comparative studies of treatment with 50 mg. and with 500 mg. of paludrine daily for ten days, and with combined quinine and pamaquin for a similar period. From these studies it appears that a combination of quinine and pamaquin is more effective in preventing relapse within six months than is either dosage of paludrine. Nevertheless, although the quinine-pamaquin treatment seems to be twice as effective as paludrine in preventing relapses, the relapse-rates after it were by no means insignificant. That the relapse-rate after an acute attack is twice as high with one form of treatment as it is with another is an important observation, but it is only one part of the picture. Against this achievement must be set the facts that quinine in the dosage advocated has unpleasant side-effects, and that the use of pamaquin necessitates the patient's retention in hospital, if not in bed, during its administration.

It has been amply demonstrated that suppressive treatment with small doses (100 mg.) of paludrine twice weekly prevents clinical relapse of B.T. malaria, and that this treatment can be given for long periods without inconvenience or danger.[2] The relapses which may follow paludrine treatment can thus safely and surely be prevented by subsequent administration of this drug in remarkably economical dosage. Relapses following quinine-pamaquin treatment, on the other hand, cannot be suppressed by a continuation of these particular drugs in any dosage which is free from side-effects, and, in the case of pamaquin, free from the danger of grave toxicity.

It is impossible to forecast which cases of B.T. malaria will relapse after either paludrine or quinine-pamaquin treatment of an attack: it is certain that some will do so sooner or later in the absence of further treatment. In these circumstances it may prove that paludrine can be given more profitably in therapeutic dosage for a day or two only, to arrest the attack, and then in 100-mg. doses at biweekly or weekly intervals over a period of, say, six months. This would involve little alteration in the gross amount of drug consumed, and would ensure that every patient could continue his normal life and vocation throughout this period without interruption by relapsing malaria. A study of the relapse-rate after such a procedure would be interesting. The problem of relapsing B.T. malaria is of immediate importance, and it still awaits satisfactory solution.

PART-TIME NURSES

> "Towards the end of 1945 the position of the county infirmaries in Gloucestershire in regard to the supply of nursing staff became desperate. In some hospitals the matron was the only qualified nurse on duty for long periods, and it seemed inevitable that some, if not all, of the infirmaries would have to close down."

In his foreword to a memorandum[1] from the Gloucestershire County Council, Dr. T. B. H. Haslett is describing a state of things to be found at present, in greater or less degree, throughout the country. The difference lies in the fact that Gloucestershire has solved the problem. Dr. Haslett outlines the transformation in the infirmaries which followed the introduction of a competently planned and well-run part-time nursing service. Mr. W. A. Shee, the public-assistance officer to whom the credit for the scheme must go, first appealed for part-time nurses in February of this year. By a bold and imaginative stroke it was decided that they should be asked not merely to supplement the full-time staff but to *become* the staff, augmented where possible by any full-timers available. This completely new departure could only be managed by rearranging the nursing work in all the county infirmaries: and, thanks to the collaboration of the matrons, this was done. The interests of the existing full-time staff were safeguarded, and the influx of newcomers made it possible to shorten and redistribute their hours of work.

The appeal was for four kinds of recruit—trained nurses, enrolled assistant nurses, nursing attendants, and nursing orderlies—and so could be made to all women in the area. All suitable candidates who came forward and offered to do a few hours' duty were welcomed, and those engaged soon acquired a loyalty to the infirmaries in which they served. Many, when asked, were willing to arrange their home lives in such a way as to do a regular four-hourly shift, and all who were thus regularly employed got privileges which encouraged their steady attendance. A brochure setting out their terms of service has been distributed, and it is written with singular freedom from small tyrannies. The writer clearly does not think in such phrases as: "They have got to understand that . . .", "They will have to . . .", "We can't have them. . . ." The attitude is rather: "What transport, what meals, what uniform do women who take on this work need and deserve?"

The working day has been divided into four shifts: 8 A.M.–12 NOON, 12 NOON–4 P.M., 4–8 P.M., 8 P.M.–8 A.M. No

---

[5] Dowling, G. B., Prosser Thomas, E. W. *Lancet*, 1946, i, 919.

[6] Freeman, S., Rhoads, P. S., Yeager, L. B. *J. Amer. med. Ass.* 1946, 130, 197.

[1] Adams, A. R. D., Maegraith, B. G., King, J. D., Townshend, R. H., Davey, T. H., Havard, R. E. *Ann. trop. Med. Parasit.* 1945, 39, 225.

[2] Fairley, N. H. *Trans. R. Soc. trop. Med. Hyg.* 1946, 40, 105.

[1] Part-time Nursing. Gloucestershire County Council, 2, College Street, Gloucester.

For example, the early bacteriologists gave very varied accounts of the number and position of the flagella of any one species: if the flagella are no more than trailing tags of capsular substance this disagreement is not surprising considering the diversity of methods used to demonstrate them. Such has been the difficulty in deciding by direct observation whether an organism is motile that modern practice has turned to the functional test of the Craigie tube or "motility agar" in which the bacterial growth is seen to spread. One argument of PIJPER's is not quite convincing. He remarks that many motile bacteria, described in the textbooks as "rods," are often seen in stained preparations to be curved; but the same may be said of *Mycobacterium tuberculosis* or *Corynebacterium diphtheriæ*. Where too lies the essential difference in cell structure between *Salmonella typhosum* and *Shigella sonnei* by which the first can flex its body, spin, and move, while the second remains in rigid immobility stirred only by the molecular buffeting of brownian movement?

It is probably too near to teleological heresy to ask what advantage motility confers on an organism. Can *Bacterium coli*, like Leander, stem the ureteric stream and reach his Hero in the kidney?

Dangers of Calciferol

IN the last ten years, with the introduction of concentrated preparations of vitamin D in convenient forms, very large doses have been administered not only in rickets but also in a variety of intractable conditions including arthritis, hay-fever, psoriasis, the common cold, and lately lupus and other forms of tuberculosis. The startling success reported in lupus may well lead to a wider (and wilder) use of these preparations without due regard to their known dangers Soon after the antirachitic action of irradiated ergosterol was discovered toxic effects of overdosage were reported in animals, and during 1928–31 many cases of toxicity in man were recorded in Germany.[1] These were due to a particular brand of irradiated ergosterol called 'Vigantol,' a German preparation containing a high proportion of toxisterol, which is more toxic than calciferol and has less antirachitic activity. It is not surprising that doses of vigantol as low as 2·5–5 mg. had toxic effects Unfortunately, however, toxisterol was not the sole cause of the trouble, for in 1932, when pure crystalline calciferol was obtainable, toxic effects in animals and later in man were described once more, though a higher dosage was needed to elicit them.

The toxic effects of calciferol (vitamin D_2) are identical in animals and man,[2] and appear to be simply an exaggeration of its physiological action. The symptoms of overdosage in children have recently been described by DEBRÉ and his colleagues[3] These French observers have had personal experience of 9 cases, and have collected published data concerning others, including 10 deaths Anorexia is the first invariable symptom, and it appears suddenly and may become total in two or three days Nausea, with vomiting in the more severe cases, appears a little later, equally suddenly. The child complains of diffuse aches and pains, particularly in the head and epiga trium, and he becomes apathetic, pale, drowsy, torpi and later cachectic, confused, and stuporose; the is polyuria and polydipsia, with impaired ren function and disordered calcium and phosphor metabolism. Constipation is usual, sometimes aft an initial diarrhœa, and the child gets up at night t urinate and to drink, as kidney function deteriorate The picture will often suggest tuberculous meningiti but the cerebrospinal fluid is normal, and the tempera ture is not raised except in severe cases. Signs o central nervous system involvement, such as apraxi aphasia, convulsions, and cerebral vascular accidents have been noted in the terminal stages of fatal case Hypertension is a common finding but not an earl one; it may not develop until a few days after th drug has been stopped and may persist for severa weeks, even worsening for a time, although no mor calciferol is given. The urine may contain albumi and calcium phosphate crystals. Kidney-functio tests show an impaired ability to concentrate the urin and impaired clearance of phenolsulphonphthalein The blood chemistry is all-important in the diagnosis Blood-calcium is almost (but not quite) invariabl raised, and there is a high level of blood-phosphoru and blood-urea. Radiography may reveal calcificatio in soft tissues and lungs and rarefaction of bones The prognosis is excellent if the diagnosis is made in good time and the calciferol discontinued As a rule kidney function and blood-pressure return to normal and there are apparently no lasting ill effects.

The pathology is reasonably well known from the small number of necropsies and from animal experiments. At first the excess of calciferol causes an unusually large proportion of the dietary calcium to be absorbed in the gut. Calcium and phosphorus contents fall in the fæces and rise in the urine The more calcium there is in the diet the easier it is to produce signs of intoxication—hence most authorities agree that the calcium intake should be kept low during massive vitamin-D therapy. Later, when the animal stops feeding, the high blood-calcium level is maintained at the expense of the bones, and osteoporosis results. There is a negative balance of both calcium and phosphorus, and a fall in the blood and kidney phosphatase. Calcium is deposited, following its high concentration in the blood, in renal tubules, bronchi, the walls of large blood-vessels, heart, stomach, and soft tissues. In young animals excessive deposition in the epiphyses takes place, interrupting growth, an effect which has not yet been reported in children. This metastatic calcification apparently occurs where phosphatase is most abundant. All these effects are identical with those caused by an overdose of parathyroid.

The most important question in practice—how much calciferol will cause these symptoms—cannot be precisely answered, because there is a wide individual variation in the toxic threshold DEBRÉ's children had ingested a total of 60–150 mg "over a short time", he thinks that a considerable number of subclinical and undiagnosed cases occur, and that mild toxic symptoms might result from a single dose of 15 mg of pure calciferol in a child. According to PARKS,[4] a daily dose of over 1 mg. (i.e., 40,000 I.U.)

---

[1] Pfannenstiel, W. *Lancet*, 1928, ii, 845.

[2] Harris, L. J. *Ibid*, 1932, i, 1029.

[3] Debré, R., Thieffry, S., Brissaud, E., Trellu, L. *Pr. méd.* Nov. 16, 1946, p. 769.

[4] Parks, A. E. The Vit [illegible] Chicago, 1939, p. [illegible]

group of organisms presents many difficulties, and it may well be that they often escape recognition. Dr. G. M. Findlay, at the same meeting, suggested that it might be useful to find out whether streptococci isolated from rheumatic joints are ever contaminated with members of the group; he also thinks that the effects of inoculating streptococci into joints already infected with pleuropneumonia-like organisms should be studied. Two uncommon human diseases in which the group may be implicated are Haverhill fever (generally held to be caused by *Streptobacillus moniliformis*) and Reiter's disease; both conditions are characterised by polyarthritis, and Findlay suggests that all cases should be thoroughly investigated for pleuropneumonia-like organisms. It must, however, be remembered, as Salaman and others[1] have pointed out, that these organisms are fairly commonly parasitic in man, so their isolation from patients with a particular disease is not enough. Even if investigation fails to show any connexion between the pleuropneumonia group and human rheumatic infection, these organisms can be used to set up an infective arthritis in rodents and thereby provide us with a new, if oblique, approach to a difficult problem.

THE MIND IN PHTHISIS

As Dr. George Day pointed out on Nov. 16, resistance to tuberculosis remains a mystery because it does not follow the usual rules. The bacillus often attacks young people whose resistance to other diseases is presumably high; and many of them do not seem to have been subjected to recognised predisposing conditions such as malnutrition, overcrowding, bad working conditions, and exposure. As the share of the mind in the body's ills becomes increasingly clear, it is natural to look closely at the mental accompaniments of diseases which have always been accepted as purely somatic. This Dr. Day has done, with results that whet curiosity. Certainly the prospect of a long illness is not always unwelcome: the young person who finds adult responsibilities heavy, and love denied, may in fact look forward to six months' enforced idleness in friendly surroundings as a respite. Whether this state of mind would encourage his tissues to give the tubercle bacillus "a good home instead of destroying it or imprisoning it for life" is a question which needs studying from many aspects. It is conceivable that anxiety—which can influence the secretion of glands, raise the blood-pressure, and injure the gastric mucosa—can also alter the body chemistry in a way favourable to the tubercle bacillus. Certainly the disease attacks many at an age when the emotional demands of sex are at their height; and an undue proportion of these young patients, Dr. Day considers (though he gives no figures), have recently had an unhappy love affair. He gives an example in which anxiety deriving from this source seemed to hinder the healing process; and other factors, such as escapism and guilt, seem to have been accompaniments in his subsequent cases. The converse of the picture is the rapid and unforeseen recovery of a young woman whom an exacting family life seemed to suit better than the classical remedy of rest. It would be useful to know whether other tuberculosis workers share his experience that some 30% of a sanatorium population are sick in mind as well as body.

It must be remembered, of course, that the patient with tuberculosis has good grounds for anxiety in his disease, quite apart from other troubles; indeed, Dr. Houghton and Dr. Corrigan, whose paper we print this week, find that anxiety and depression colour the prevailing mood more often than spes phthisica. Moreover, instead of the long peaceful illness to which, perhaps, he has been unconsciously looking forward, the modern tuberculous patient must face collapse therapy ranging from artificial pneumothorax to thoracoplasty. Fear of operations, however slight, is both deep and common, and for an apprehensive patient treatment may itself become a severe emotional strain. Houghton and Corrigan, discarding the customary sedatives, have made bold and successful use of amphetamine ('Benzedrine') in some of these cases, counting on its ability to stimulate the nervous system. Their results will no doubt encourage others to make further trials on the same lines.

BRADFORD WANTS A MEDICAL SCHOOL

Colonel M. Stoddart-Scott, M.D., M.P., has presented a memorandum to the Minister of Health stating that a medical school, which would train 50 undergraduates a year, could be set up in Bradford in time to accept its first students next October. The memorandum is the outcome of the deliberations of a conference of representatives of the city health department, the local medical profession, the hospitals, and the Bradford Technical College.

The college, which has applied for recognition as a university college, is already recognised by London University for the first M.B., and its facilities could be expanded to include full preclinical training. Clinical work would be undertaken at the Royal Infirmary and at St. Luke's, a pioneer municipal hospital of high standing. The school would be prepared to train students for the M.B. examinations of London and Leeds as well as for the English and Scottish Conjoint examinations.

Admittedly Bradford is near to Leeds, but its own population is close on 300,000, and with its immediate environs the population of the district exceeds a million. Thus it is at present the largest centre of population *without a university*. A more potent argument against the new proposals may be the suggestion of the hospital surveyors of the Yorkshire area that Leeds should confine itself to undergraduate teaching and Bradford become the postgraduate centre of the region.[1] The reaction of the General Medical Council, the Minister of Health, and the Lord President of the Council to the memorandum will be awaited with interest, not only in Bradford but in all the other areas where plans for new medical schools have been mooted, so far without success. This proposal, and others like it, will also raise problems connected with the size and shape of the projected hospital regions.

TRADE-UNION MEMBERSHIP

WE commented last week on the action of certain local authorities in requiring their staff to join a trade union. As reported in our Parliamentary columns, the Minister of Health has now reminded local authorities that "their primary duty as health authorities is to maintain the efficiency and smooth running of their health services and to ensure the welfare of the patients for whom they are responsible." All other considerations, he points out, must be regarded as secondary. "While the Minister is anxious that doctors, nurses, and members of similar professions should join a trade union or appropriate professional association, he considers that this matter should not be determined by the unilateral action of local authorities."

Last Monday the Willesden council decided to suspend all action on its recent resolutions about conditions of employment.

THE Order of the Garter has been conferred on Viscount ADDISON, F.R.C.S. He is the first doctor to receive this honour.

The *American Practitioner*, which began publication in September, is a monthly journal (50s. a year post free from J. B. Lippincott Co., Aldine House, Bedford Street, London, W.C.2) intended for articles "not of a highly specialised nature in the fields of general medicine and surgery."

---

[1] Salaman, M. H. and collaborators *J. Path. Bact.* 1946, 58, 31.

[1] See *Lancet*, 1945, ii, 681.

part-time nurse need undertake night duty unless she wishes. Those who do 24–28 hours weekly on day shifts, or three nights a week, are regarded as regularly employed. “Reserves” are on the waiting-list for regular duty. Those who do less than 24 hours' day work a week, or less than three nights, are regarded as casual workers.

On day duty trained nurses get 2*s*. 6*d*. an hour, enrolled assistant nurses 2*s*., nursing attendants 1*s*. 9*d*., and nursing orderlies 1*s*. 6*d*. On night duty the rates are £1 5*s*. nightly for a trained nurse, £1 for an enrolled assistant nurse, 17*s*. 6*d*. for a nursing attendant, and 15*s*. for a nursing orderly. Any nurses doing more than 28 hours' day duty, or more than three nights weekly, are paid proportionately on the Rushcliffe scale.

These rates, when compared with the present cost of domestic help, cannot be called high; yet they have attracted women to part-time service, which shows that objections to work in hospitals are not primarily financial.

Transport in public-hire motor-cars is provided from approved centres, and travelling time is allowed as an extra. In cases where part-time nurses have to make a considerable journey by bus or train they may be allowed fares. Time is allowed for meals on duty, and night staff have a break of two hours besides the time allowed for meals. All meals are served in the nurses' quarters, not on the wards, and are substantial. The morning and evening shifts, for example, are given a meal of fried sausages, or scrambled eggs, or beans on toast, with tea, coffee, or cocoa; the afternoon shift and those on night duty get a two-course dinner and a cup of tea. Night staff coming from a distance may also be given breakfast on coming off duty. Every part-time worker gets 2 or 3 dresses of the appropriate colour for her rank, and 3 caps and 6 aprons; these are all of modern type, and are laundered without charge.

Regularly employed part-time nurses are given four weeks' leave with pay after the first year's service. They are also allowed sick-pay at reasonable rates.

Some 150 part-time nurses are now working in the nine county infirmaries, and more are wanted, though some infirmaries already have a waiting-list of nursing staff. At no time have any of the infirmaries or their wards been closed for lack of staff; and at one infirmary a new wing of 12 beds for operable cases of malignant disease has been opened, and is staffed almost entirely by part-time nurses.

The scheme has not proved unduly expensive, despite the provision of transport. Sums formerly spent on engaging nurses from coöperatives have been saved, and the authority has not had to provide quarters and personal laundry for part-time workers. The patients are well satisfied: Dr. Haslett describes them as “full of praise for the attention they receive.” For one thing, night staff having been reduced to a minimum, all morning bed-making and washing is left to the day staff, and patients are allowed to sleep undisturbed till 7 A.M.; for another, many of the part-timers are older women who take a personal interest in their patients, and thanks to their short span of duty they come to work in a fresh and responsive spirit. The wards are no longer made tidy in time for the doctor's morning visit; and the doctors are glad of it. They see the nurses going on with their work while they make their rounds, and they can judge nursing standards better. The full-time nursing staff now do an 8-hour span of work, either from 8 A.M. to 4 P.M. or 12 NOON to 8 P.M. With the meals allowed on duty their hours have fallen considerably below 48 a week, and they fully approve the part-time system. It is worth emphasising this, because full-time nurses have sometimes objected to the introduction of a part-time scheme on the ground that part-timers get the choice of the pleasant shifts, while the permanent staff are obliged to take the unpopular shifts. Actually, the work of the full-time staff is so much lightened and so much better distributed that this objection has little force. It is also sometimes said that matrons dislike the system because it needs so much organising. This may be answered from Mr. Shee's experience that “there are no stronger advocates of the scheme in the county today than the matrons.”

Here surely is an answer to one of our most acute nursing problems, the care of the chronic sick. Local authorities with infirmaries to staff should write for the Gloucestershire memorandum.

GRANULOMATOUS LESIONS OF LIVER IN KALA-AZAR

THE atrophic and fibrotic lesions of the liver due to *Leishmania donovani* in visceral leishmaniasis in man have been described many times. So have the granulomatous lesions of the skin in post-kala-azar dermal leishmanioid, which appears as an occasional sequel to visceral leishmaniasis, usually a year or so after treatment, and has been thought to indicate a readjustment between man and his parasite.[1] But in visceral leishmaniasis of dogs, caused by *L. canis*, which despite its alias is almost certainly identical with *L. donovani*, granulomatous lesions of the liver and other viscera were described by Redaelli.[2] Now Bogliolo [3] reports the discovery of such hepatic lesions in visceral leishmaniasis in man; apart from the granulomatous foci, the rest of the liver presents the appearance which is characteristic of visceral leishmaniasis affecting that organ, there being no other signs of inflammation. He interprets the formation of these granulomatous lesions as a local reaction to the products of disintegration of dead parasites, independent of the atrophy and fibrosis initiated by the living parasites.

EXPERIMENTAL ARTHRITIS

THE study of rheumatic diseases in man has been hindered by the absence of spontaneous or easily induced arthropathies in animals. On the bacteriological side it is at least clear that various streptococci can produce arthritis when injected into the joints of rabbits and other animals; and rabbits sensitised by an intravenous injection of streptococci are more likely to develop arthritis after a joint infection than uninoculated controls. These and similar findings have led to speculation about the sequence of events in human rheumatic disease, but the comparison of experimental and human infections does not lead far. One of the more interesting types of arthritis which occurs naturally in pigs and sheep is caused by *Erysipelothrix rhusiopathiæ*. Swine erysipelas is not uncommon in this country and takes two forms: an acute septicæmia or “the diamonds,” and a chronic infection with endocarditis or arthritis as the main manifestation. At a meeting of the Heberden Society on Oct. 25, Dr. D. H. Collins recalled that he and Dr. William Goldie had shown that in young pigs the disease is contagious and may be conveyed as an arthritis and not as an acute exanthematous disease. With repeated intravenous injections of the organism they were able to produce arthritis in pigs, and examination of the inflammatory changes in the joints showed focal collections of lymphoid and plasma cells in the synovial villi and other changes similar to those found in human arthritis. Human infection with *E. rhusiopathiæ* is well known as causing erysipeloid, but this is rarely followed by arthritic changes; and there is no evidence that the organism is important in cases of human arthritis.

With the discovery that pleuropneumonia-like organisms can cause arthritis in wild and domestic animals, many investigators sought these bacteria in human infections, and in 1939 it was claimed that they had been recovered from cases of rheumatic fever. This claim was later withdrawn, and since then they have not been cultivated from either joint exudates or tissues of patients with rheumatoid arthritis or rheumatic fever; but

---

1. Napier, L. E., Krishnan, K. V. *Indian med. Gaz.* 1931, 66, 603.
2. Redaelli, P. Ricerche e Studi sulla Leishmaniosi Viscerale del *Mediterraneo, Catania*, 1933.
3. Bogliolo, L. *Arqu. Clin.* 1946, 3,

outh Walians. and the country is divided by a central lock of mountains through which no road or railway et runs.

The new region suits South Wales well, for Cardiff is good centre with good doctors and a competent school. ut North Wales for clinical matters cannot depend on ardiff. To begin with, a patient could only be moved here via Shrewsbury and Hereford after a journey of everal hours in ambulance or train. for the alternate est route is tedious and there are no through trains. imilarly North Wales naturally lies in the Liverpool onsulting area. A Cardiff specialist is never seen there ; s a matter of practical convenience consultants from iverpool. Manchester, or Birmingham are automatically alled in. Again most of the local doctors have been rained at the Liverpool school. which North Wales has ome to regard as largely her own. The proposal to set p a medical school at Bangor, which already has a niversity college, has encountered difficulties, for it es near the north-west corner of the area and has neither he staff nor the population to become a medical centre.

The local feeling is clear ; for at a recent meeting of anel practitioners it was unanimously resolved that orth Wales should be attached to Liverpool for clinical urposes. save for a few districts which are linked by ransport with Manchester or Birmingham. But a good ld British compromise may in the end evolve, for the inister has himself provided a loop-hole in saying that region may be allowed to have functions outside its wn area where desirable. It is thus possible that the octors will be persuaded to bow to the politicians, ntoning "Wales for the Welsh," provided that in ractice, at any rate for the present, they are allowed to tick to Liverpool and Manchester.

iverpool

The medical profession here are perturbed at the mall size of their region compared with that of their eighbour Manchester. Both cities have medical schools f about equal size, each admitting 100 undergraduates year. Yet Liverpool has been allotted a population of ust under $2\frac{1}{2}$ million while Manchester has nearly million. Furthermore the area assigned to Manchester $2\frac{1}{2}$ times as large as that of Liverpool. Students will end to apply for admission to the medical school which the centre of their area. Liverpool, drawing the same umber of students from a smaller area and population, ill, it is feared, ultimately have a lower standard of admision and a smaller chance of attracting outstanding candilates. Her school will thus be subordinate to Manchester.

So much for general criticisms. But the boundaries hemselves are held in several places to disturb the flow f students and patients to centres to which they are aturally linked by tradition, commerce, and transport. The most serious blow to Liverpool is of course the mputation of the North Wales area, which ignores xisting practice and planning alike. The hospital urveyors of the north-west area declared that Liverpool as the main centre for North Wales, and indeed also ished to associate Merioneth and Montgomery with it. ossibly in view of the inaccessibility of Cardiff the inister has it in mind to set up in North Wales a regional ommittee with delegated powers and its own office. ut if this regional committee were put under a regional oard at Cardiff. Liverpool would be left with esponsibility but without power or representation.

On the other hand it is felt that the Crewe area. includng Knutsford, which at present comes into the Liverpool egion, has obvious natural associations with Manchester.

To redress the balance between the Liverpool and anchester regions the following solution is put forward. orth Lancashire and South Westmorland (including arrow, Lancaster, Blackpool, and Preston) was desribed by the hospital surveyors as neutral territory etween Liverpool and Manchester, and though on the hole the surveyors recommended its assignment to anchester its transfer to Liverpool would not infringe ny medical principles. If this area and North Wales ere given to Liverpool, and the Crewe area moved to anchester, each region would then have a population f about $3\frac{1}{2}$ million and contain an approximately qual territory. Above all it would not leave Liverpool ith any feeling of grievance against its friendly neighbour anchester.

Manchester

There is a strong feeling here that the proposed areas in the north-west need revision. The basis of the trouble seems to be that North Wales, though generally dependent on Liverpool for its ultimate medical care, is placed under the ægis of Cardiff. In terms of travelling it would probably take three days for a patient or doctor to go from Colwyn Bay to Cardiff, have an interview. and return, whereas a similar visit to Liverpool could be managed in a day. The general opinion in Manchester is that, to make up for this district which it has lost, Liverpool has been given parts of Cheshire and Lancashire which have close associations with Manchester. The most striking anomaly is found in the case of Knutsford. Northwich, Lymm, and Congleton, all nearer Manchester than Liverpool and having no easy connexion with the latter city. Knutsford is in fact a residential suburb of Manchester, and Lymm largely so.

Several towns, including Wigan. Warrington, and Crewe, are almost equidistant from the two cities, and in point of distance and accessibility might be apportioned to either. But through their hospitals, and in some cases through their medical officers of health, these towns have asked that they should maintain their long-standing relations with the voluntary-hospital area of south-east Lancashire, represented by Manchester. A shift to the left would do much to satisfy both Liverpool and Manchester.

A small area in question is that of Saddleworth. This, though on the west side of the Pennines, is in Yorkshire : but its medical connexions are through Oldham and Ashton-under-Lyne on to Manchester. Its communication with the east is much less easy. It would be well allotted to Manchester.

Newcastle

The proposal to divide the country into regions is the least controversial part of the National Health Service Act. At first the regions will conform to the existing spheres of influence of the university medical centres, but as experience grows we must expect changes through the adjustment of border territories and the creation of new regions. There may be border troubles for some places. such as the clash between Cardiff and Liverpool over North Wales. Common sense and established practice would base North Wales on Liverpool, but Welsh nationalism will resist this. Over the remainder of the country the proposed regions will be accepted without much argument.

Drawing regional maps is the easiest part of the plan. What happens within the region matters. It is a momentous occasion, with an opportunity to provide the hospitals the country needs. But have we the men with the knowledge, experience, and imagination who will devote themselves to the work of the regional boards ? Have we the administrative officers who will be capable of entering into the life of the region and of wielding a proper influence ? The E.M.S. was good only in parts, and too many of its administrative officers had rôles which were innominate and obscure. From the outset the Ministry must strike a high note of promise and achievement. It will defeat its own purpose if it is too timid. Patience is a virtue only when it is used to a definite end. We have received the first intimations of the Ministry's plan, but we shall await their further proposals with some uncertainty. Is it too much to expect that the Ministry will capture the imaginations of the regional boards by describing some of the standards they expect them to attain ? Government buildings in the provinces and regional offices of the Ministry of Health do not give an impression of æsthetic charm or virile energy. Can the regional boards step off on the right foot and avoid the same impression ?

One of the boards' chief tasks will be to improve the hospital and specialist services in the big industrial districts. For this they will require the right man working in the right conditions and right environment. A period of work in a non-teaching hospital would be a great advantage. and might give a man opportunity to prove himself both in practice and research, thereby increasing the number of those eligible for return to responsible posts in the university medical centre.

Reconstruction

THE REGIONS

LOCAL COMMENTS ON MINISTER'S PROPOSALS

THE Minister of Health has proposed division of England and Wales into 14 regions, in each of which the hospital and specialist services will be in charge of a regional hospital board. Last week we published comments on the scheme as a whole. The following are comments from doctors working in the particular areas.

Bristol

From Bristol.—Many experienced administrators in the provinces are concerned that throughout the Minister's scheme too much stress has been laid on population and too little on distances and the natural grouping of areas —which in the south-west are very important. As regards population they maintain that the level has been set too high. Some feel that the "London view" has prevailed over "provincial experience." When areas and population are large, local views and interests are swamped and the service becomes "local government" in name only.

If all areas must be associated with a university medical centre, then Bristol is the natural headquarters of the south-western counties. But in this area distances are long—there are more than 250 miles from the northern end of Gloucestershire to Land's End. The Minister has foreseen some difficulties, and suggests a regional committee for Devon and Cornwall, responsible to the board "with delegated powers and its own offices." Everyone would agree that some division of the area is necessary. On the question whether or not there should be a committee responsible to the board for part of the area, opinions differ. It is not conducive to smooth administration to have a committee which cannot approach its university centre, or even the Ministry of Health, except through a regional board which is itself directly responsible for an adjacent area.

There is much to be said for two regional boards—each associated directly with Bristol as its university centre—even if the Minister rejects reconsideration of the case for having 30 or more regions for the whole country.

From Devon.—The hospital survey recommended a region extending from 25 miles east of Cheltenham to Land's End, based on Bristol. Consultants from Devon and Cornwall, meeting at Exeter in August, agreed that this region would better be divided into two.

The precise function of the university centre needs definition. In general, Devon and Cornwall have not looked in the past particularly to Bristol as their academic centre, and except in the last year or so, when resident posts for ex-Service medical officers have been arranged through Bristol, they have not regarded Bristol as a primary source of resident or consulting staff. Hence they would like to advertise their requirements throughout the kingdom and so have the widest possible field from which to draw applicants. An additional or alternative function for a university centre would be to supply experts in comparatively narrow specialties, such as neurosurgery and thoracic surgery. These would make tours of the region and either deal with cases in the area hospitals or move them to a university centre for investigation and treatment. A third function of the university would be to arrange postgraduate courses for practitioners. The consultants of Devon and Cornwall thought that the proposed region was too large and unwieldy to serve these two latter functions efficiently. Truro is about 170 miles from Bristol, and it was felt that such distances precluded satisfactory administrative contact. Finally, the population in the areas encircled by Exeter, Plymouth, and Truro is sufficient to justify the establishment of a separate regional organisation, and the appointment of specialists to cover all branches of medical and surgical work.

In Exeter there is already the nucleus of the university of the south-west, and there is a strong hope that ultimately a medical school will be started in association with it. Such a hope will be a stimulus to raise standard of medicine in Devon and Cornwall.

It is suggested that the regional boundary should approximately on a line joining Bridgwater and Bridp Such a line conforms to the existing natural catchm areas for the hospital and consultant services of Bri and Exeter. The region thus constituted would have its area centres Exeter, Plymouth, Truro, and possi Torquay. The choice of a regional centre lies betw Exeter and Plymouth. Those in favour of Exeter u the traditions associated with the county town, with existing university centre, and by including the Torq and Paignton group in their area they claim a populat not far short of Plymouth. Those who favour Plymou point to its more central geographical position, its lar population, and its greater hospital resources.

Wales

From the South.—The Government having refused appoint a Secretary of State for Wales, the Minister Health has offered a consolation prize by declari Wales and Monmouth one hospital region with university centre at Cardiff. In making this decision, he acceding to a request made to him unanimously by t local authorities of Wales and Monmouthshire, *and it* said that he was greatly impressed to find so mu unanimity in Wales on any subject whatsoever!

In the parliamentary debate (*Hansard*, July 2, 194 Mr. Bevan admitted that Cardiff is not easy of acce from North Wales, which pivots on Liverpool, but sa that nevertheless "there may be an administrati convenience in having one regional hospital board f Wales, with both Cardiff and Liverpool universiti represented on it." The case for administrative co venience has yet to be made out, and it is difficult t visualise any other convenience from the arrangemen proposed. From North Wales to Cardiff is a long an tiring day's journey, whereas from North Wales t Liverpool is a matter of an hour or so. So much fo the convenience of patients. As to the consultants c Cardiff (who incidentally are said to have joined wit the other consultants in Wales in voting unanimousl for Wales and Monmouth as a single area), these ar over-busy even at present in coping with the demands of Cardiff and its immediately surrounding areas. It i difficult to see how, even with air transport, they could possibly cater for the consultant needs of North and Mid-Wales. It is true that there are consultants also a Newport and Swansea, which are also situated in Sout Wales; but neither of these is a teaching centre lik Cardiff.

Possibly the Minister may have been influenced, in hi attempt to marry sentiment with practice, by consideratio of the record of the Welsh National Memorial Association which in 30 years has built up a comprehensive tuberculosis service which is claimed as being as complete efficient in the remotest parts of Wales as in the fou county boroughs. But a tuberculosis scheme has bee hitherto an ad-hoc scheme; and by the nature of thing easier to organise than a multi-purpose general medica and surgical service.

It is understood that the local *authorities, in* thei plea to the Minister to have Wales and Monmout declared a single area, suggested that, until the hospit and specialist services in the North and Mid-Wa areas are brought up to the necessary standard, th regional board shall be empowered to make arrangements with other regional boards, covering Liverpool, Manchester, Birmingham, and Shrewsbury. In another part of the speech already quoted, the Minister said: "we must have as much flexibility *as possible.* What is more, after the boards have *been set up* and we hav had experience, we must *have* modification. We shall certainly have to modify administratively."

The Welsh experiment *will be* well worth observation. It will be interesting *to see* whether Welsh national sentiment in action can produce sound practical achievements.

From the North.—Administratively and politically it is tempting, *especially* for a Minister from the south, to make Wales a region for the Welsh. But traditio and mountains *stand* in the way. The people of the north, with *memories of* Owen Glyndwr and Mortimer, hold themselves *(to* put it mildly) different from the

Lincolnshire. Fortunately, as the Minister has pointed out, the boundaries of regional areas need not, and will not, prevent the free passage of patients from one area o another; and there is no doubt that, as the regional boards become familiar with their regions, readjustments of boundaries will be made.

London, North-east

This region is to be based on the London Hospital and St. Bartholomew's, and is to include a sector of the metropolis combined with the larger portions of Essex and Hertfordshire. It therefore brings under one administration the Cockney and the extreme type of countryman, who may be only sixty miles apart in distance but whose outlook on life, including medicine, differs by hundreds of years. Essex villagers can still be found who regard London as "furrin parts."

The northward boundary does very much follow the present sphere of influence of London to the south and Cambridge to the north. Communication by road and rail to the larger centres has obviously been carefully considered and is satisfactory. If the large size of the region is going to do away completely with the hard demarcation line of the county boundary between Essex and Hertfordshire it will be a boon to those who have suffered so long from the jealousies and bickerings of the adjoining county councils. But where one boundary has been abolished, others will be created. And apprehension is naturally felt by doctors who live near the edges of the proposed new regions. The Minister will do well to allay their criticism at once, by reasserting his recent declaration that "the welfare of the patient must have priority over everything else," including administrative irregularities; and that doctors will not be penalised for sending patients over the boundaries of their region.

The other important point is the difference, already mentioned, between the rural and urban populations. The natural centres, such as Hertford, Bishop's Stortford, Chelmsford, and Colchester, must be allowed enough autonomy to be able to continue the good service they are already giving. The connexion with London must continue to help them, rather than to impose administrative restrictions.

It is of course difficult to consider the geographical problems of hospital regions when one knows so little about what they will imply; and it is impossible to give more than qualified approval until more is known about the workings of the regional administrations at different levels. With that reservation, local feeling in this part of the world is one of relief and satisfaction. We sincerely hope that further disclosures of plans will prove them to be as well thought out.

London, North-west

The regions centred on the University of London, having an average population exceeding 3 million, will present administrative problems never dealt with previously in this country. The sector scheme destroys administrative machinery already working, increases the size of the problem to be dealt with, and supplies no alternative to the machinery destroyed. Even were it possible for members of the regional board to be fully engaged in their duties, it is impossible to envisage their giving detailed consideration to the needs of an area stretching from Bayswater Road to Bridport. Does any super-specialist development within a hospital region demand a population of 3,843,250 (South-west) in order that it may be adequately organised?

The North-west region seems to have received an undue proportion of "cultural influence" by the inclusion within it of five undergraduate teaching hospitals and the main postgraduate teaching centre. This is the more remarkable when it is noted that its main population basis is the Middlesex County, wherein hospitals are not undeveloped. The separation of the North Middlesex and Chase Farm Hospitals from much of the population previously served will mean these two hospitals attempting to receive cases from areas separated from them by almost insurmountable geographical difficulties. This boundary, certainly, cannot be said to have been drawn for the benefit either of the patients or the local hospitals.

The planning, coördination, and provision of hospital and specialist services are stated to be the prime considerations determining the size and extent of the regions. If the regional hospital board is to fulfil these functions adequately it must ensure: (*a*) a bed bureau service, (*b*) allocation of function to individual hospitals, and (*c*) effective inter-hospital specialism. It should provide central legal, engineering, architectural, and purchasing departments, and all these should operate in close consultation with the individual hospitals. Considerable local autonomy should be encouraged amongst all hospital management committees. The efficiency of centralised supply and advice must be enhanced by constant contact with the periphery, where hospitals must enjoy purchase facilities of non-standardised equipment and dietary needs.

The danger implicit in the present suggestions is that efficiency will result in over-centralisation and be associated with an inaccessible bureaucracy. Without such centralisation it seems unlikely that the present non-existent regional machinery will fulfil its broad coördinating and supervisory functions.

We should, I think, limit the size of each region around London to approximately 2 million; attempt to base its administration on established organisations; and, where necessary, move the teaching hospitals as soon as possible into those outer regions where both the population and the hospitals have need of them. In the South-west region Southampton should become the autonomous centre, with its own university hospital within a few years.

London, South-west

The proposals have been well received here. As a base of academic learning and guidance, London University and its three medical schools, comprising a wide range of medical experience and administration, will, I believe, be more acceptable to the larger centres of population in the region than any alternative university centre. Three of the four larger county boroughs in the South-west London area—Portsmouth, Southampton, and Bournemouth—will also find it more convenient to link up with the metropolis for the inevitable consultations and meetings.

At first sight, the region, with a population of about 3,800,000, appears on the large side; but as Hampshire, Dorset, and the Isle of Wight are to have a regional committee, it is felt that more autonomy will be enjoyed by the group of hospitals within this sub-region. The larger area will also make it more economical to establish hospitals or units for highly specialised treatment—e.g., cerebral surgery, thoracic surgery, radiotherapy, and psychiatry.

The division of the local-authority responsibilities of Dorset and Wiltshire between two regions has apparent disadvantages, particularly as these authorities will have to provide services in both the South-west London and the Bristol regions, including epidemiological field work, and the visitation and follow-up of tuberculosis and venereal disease. However, the close proximity of these local-authority areas to the university centre of Bristol probably outweighs these disadvantages.

The grouping of hospitals and their ancillary services is long overdue, and one accepts the necessity of planning to provide more uniformity throughout the country. Even so, there are many links in the chain which appear to be missing, particularly the link between the hospital, specialist, and local-authority services. For example, in Southampton, where infectious cases arrive on ships, the port medical officer will no longer have any administrative control over the infectious-diseases hospitals which receive these cases. This may lead to difficulties over admissions for observation. It is to be hoped that, when the orders and regulations are considered, these matters, which are of great administrative importance, both locally and nationally, will successfully compete for clarification.

London, South-east

From Sussex.—The South-east region, based on Guy's and King's College Hospitals, includes only Kent and East Sussex and is about half the size of the South-west, which includes Dorset, Wilts, Hampshire, Surrey, and West Sussex. Moreover, the dividing line runs counter to the existing flow of medical services. It divides Sussex into two, an arrangement already shown to be incon-

Leeds

The area for the Leeds regional hospital board almost naturally defined itself. It has one central university, which is sufficiently far from other universities to make it an obviously independent unit; the surrounding population, though parts of it are concentrated into towns which merge almost imperceptibly into one another, is sufficiently separated from populous districts likely to belong to other regions that no difficulty could have arisen in their allocation to the Leeds region; and the population of the area is large enough to provide all the clinical material necessary for a numerous medical consulting staff, to provide enough of the rarer cases to make their advent a matter of intelligent interest rather than a unique occasion, and (most important of all in a university organisation) to provide a steady supply of pathological processes for scientific research and to satisfy all the teaching demands of a medical school.

The proposals defining the region, therefore, offer little ground for criticism. There is one district, however, which has been allotted to another region, which Leeds will probably desire to continue to draw to itself—Goole. Goole is mainly staffed by Leeds consultants and has been so for many years; the natural drainage is towards Leeds, and the reasons for allotting it to the Sheffield area are not very obvious. Northallerton, in the north, has been allotted to Newcastle, and some may feel that it should be part of the Leeds region, while on the other hand, in the south-west, Saddleworth remains with Leeds though its medical trend is towards Oldham and Manchester. Although for administrative tidiness it may be part of the Leeds region, patients will still go to Lancashire.

On a bird's-eye view the general provisions for the region are satisfactory to local interests, and the proposed arrangements coincide closely with the outline drawn by the Nuffield Provincial Hospitals Trust (Yorkshire region) and detailed in the report published by its medical services advisory committee, and also with the suggestion of the hospital surveyors.

Sheffield

My colleagues seem to be satisfied with the regional area, and no changes have been suggested.

Birmingham

Little criticism is heard here. The boundaries of our region seem to have been drawn in accordance with the facts of the situation.

Oxford

It had been feared that the area of the regional hospital board based on Oxford might correspond to Civil Defence Region 6, which included Hampshire and the Isle of Wight and had proved an inconvenient unit. Hence the immediate reaction here has been one of relief on finding that the proposed region corresponds fairly closely to the Berks, Bucks, and Oxon region of the Nuffield Provincial Hospitals Trust. The three counties have been working together closely and harmoniously in hospital affairs since 1940, and have jointly made many plans (some already realised) for coördination of specialist services. When a scheme for a cancer service was drawn up in 1944, Northamptonshire was associated with it, although not actually a member of the regional council.

The area now suggested has a population of about a million, with Oxford roughly at its centre. Though it is generally approved, a little boundary revision will be needed to ensure that natural catchment areas are not unnecessarily disturbed. We recognise that it is reasonable for the Maidenhead, Windsor, Eton, and Slough areas of Bucks and Berks to be included in North-west London, for all that there has been close collaboration of the local authorities and hospitals in this area with those of the rest of the Nuffield Provincial Hospitals Trust region. But we are less sure that this is true of the more westerly part of Bucks, embracing Amersham and the Wycombes; for, though the train connexions with Oxford are bad, and those with London are good, the road connexion with Oxford is excellent and there is a natural flow of patients from these areas to Oxford. On the north and north-east borders no special comment is needed; but on the north-west th is a strip of Gloucestershire, including Fairford a Moreton-in-Marsh, which from time immemorial h looked to Oxford for its specialist services and feels ve strongly that it should not be removed. On the sout west border there is the problem of Swindon and borough. Swindon has been a member of the Nuffie regional council; and, though from population size might be almost self-supporting for general speciali services, its plurality of hospitals conducted under vario bodies has made this difficult. It has been provided wi specialist services, as has Marlborough, from the Oxfo area, and would wish so to continue.

These boundary adjustments would be small, but a important because they chiefly affect areas which a apportioned to Bristol but are distant from it. Th would increase the population of the Oxford region about 300,000.

Some of our regional services (e.g., orthopædics) exte beyond the proposed boundaries; but in the light of t Ministry's circular we presume they will continue heretofore.

Cambridge

The region centred on Cambridge University compri the counties of Cambridge, Huntingdon, the Isle of El Norfolk, the Soke of Peterborough, and East and We Suffolk. Included within it are the county boroughs Norwich, Ipswich, and Great Yarmouth, and parts the counties of Bedfordshire, Rutland, Lincoln, Her fordshire, and Essex. It is clear that the populati will be $1^1/_2$–2 million.

The principal centres of population are Cambrid Peterborough, Norwich, and Ipswich, and these a separated from each other by large tracts of rich agr cultural land. The turmoil of the industrial revolutio affected East Anglia but little, and the growth of moder means of transport has not tended to produce dormito areas near the great centres of population describe On the other hand, the absence of large industrial centr has meant that hospital development throughout th region has been slow, and particularly the developme of municipal hospitals, with the result that gener hospital provision is inadequate, and certain speciali services are not readily available. The linking up of th principal centres will ensure that the best use is ma of hospital accommodation, and the development a expansion of specialist services in each centre can so coördinated as to prevent overlapping. For exampl Ipswich will become the focal point for the consulta services for the greater part of the counties of East a West Suffolk, sharing at the same time in the region developments in such special subjects as thora surgery, neurosurgery, and long-stay orthopæd units.

The region is fortunate in having Cambridge as i parent university. Plans are now well advanced for postgraduate medical school, and a number of spec departments are already in existence—e.g., patholog clinical biochemistry, radiotherapeutics, and expe mental medicine. Other specialties, such as hæmatolo and rheumatic diseases, will shortly be developed, a are to be followed by pædiatrics, dermatology, thorac surgery, and orthopædics. The defined region is large agricultural, and the investigation of diseases pecul to, or prevalent among, an agricultural community w be one of the tasks undertaken by the university resear departments.

In many respects the main part of the Cambrid region offers ideal facilities for coördinated and unifor development, and criticism of the Minister's propos can be restricted to the periphery. His desire th wherever possible the boundaries of the regional are should coincide with those of the local health authorit is presumably the reason for excluding almost the who of Essex and Hertfordshire, although the northern pa of those counties, being agricultural, have more common, in all respects, with East Anglia than wi London. It is in the northern part of the region, howeve that the most serious grounds for debate arise. There- no university centre between Cambridge and Sheffie and the latter university is required not only to de with a vast industrial population but also to extend i influence as far to the south-east as the farm lands

In England Now

A Running Commentary by Peripatetic Correspondents

"WALKING the hospital" was the term used in the past for the time spent in hospital after the student had served his apprenticeship with a general practitioner. Doubtless he walked much more than his successor, who arrives at hospital by bus, tube, tram, bicycle, or car. But "standing in hospital" would really have been more accurate. Forty years ago, when I entered hospital, the clerk or dresser was never allowed to sit down during ward rounds. These might go on from 1.30 to 4 P.M. or even later, and the physician, clerks, sister, and nurses, one of whom carried an inkpot and a quill pen, stood the whole time. The house-physician alone was privileged to rest one buttock on the locker, and history relates that one who worked for a very painstaking physician was found at 5 P.M. resting on the locker and reading Homer, while his chief was examining the patients in his usual careful way. In the operating-theatres the students used to stand as a rule, though they sometimes leant on the table to hold a struggling patient. Students were allowed to sit in outpatients and during lectures, but while waiting for the ward rounds to begin there was usually nowhere to sit. Doubtless this long standing was of value in learning to maintain a dignified carriage however tired the doctor might be, but it is difficult to see how it can aid the absorption of knowledge.

Nowadays in some hospitals the students are allowed to sit round the bed on stools or chairs, and I am sure that the rounds are not so exhausting as they were. I have never seen anyone fall asleep, as some students (I for one) do at a lecture however interesting it may be. I think the student's attention is less easily distracted when he is comfortable than when he is standing first on one foot and then on the other. Physicians seem more ready than surgeons to allow the clerks to sit down. The surgeon tends to go more quickly from bed to bed than the physician does, so the stools would have to be moved more often in the surgical rounds, but surgeons should at least try the experiment. Not all physicians allow stools, and the suggestion has been made that those who do so are currying favour with the students and thereby trying to attract large crowds. This is an unworthy accusation, for physicians as a whole prefer smaller classes where the clerks can examine the patients without too long exposure. Let us hope that the practice will spread and that standing in wards will become as obsolete as walking the hospitals.

* * *

When the business-end of a cow appeared through my office door followed by two-thirds of the animal my first reaction was to grab for the telephone in order to ring up J of the Public Works and say "I told you so." I had always argued that it was a mistake to build a ramp up to the office in place of steps. I decided, however, that it would be wiser to leave by the window before the remaining third of beef won the tug-of-war that was obviously taking place somewhere in the rear. At the top of the ramp a scandalised peon was holding on determinedly to the cow's tail, yelling for help, while just behind him a Hindu veterinary inspector and an unusually burly Bedouin were about to engage in a life-or-death struggle. Next minute a small army of orderlies, sweepers, and bearers went into action and the three actors in the comedy were pushed down the ramp and out into the safety of the yard.

Pandemonium then broke loose. Out of the babel of Arabic, Hindustani, and English I gathered that the Bedouin was complaining against an unjust decision of the vet. The latter said the cow was pregnant, and war-time regulations, still in force, forbade the slaughter of pregnant animals. The Bedouin maintained she was not, and, taking advantage of that cursed ramp, had driven the animal into my office so as to make sure that I saw her. When you sign on the dotted line for the Colonial Medical Service you can be sure of one thing—you will be frequently landed with some out-of-the-way job. My peculiar chore is administration of the Veterinary Department.

Unfortunately nobody has ever enlightened me as to the signs and symptoms of pregnancy in the cow. For once Macewen failed me and the number of rings on the horns or its classification as cow, heifer, stirk, or quey furnished no answer to the problem. So, keeping Solomon well in mind (after all, this is the Queen of Sheba's reputed embarkation point) I said the animal was to be slaughtered and if she was found to be pregnant the cattle dealer would be prosecuted.

Both parties were agreeable, so I accompanied them on their unpleasant mission to see fair play (Moslem abattoirs do not favour humane killers). While waiting the vet regaled me with endless tales of the dishonesty and general rascality of Arab cattle dealers, but even he was reduced for a moment to complete silence when a grinning butcher put out for our inspection a perfectly empty uterus. Then he found his voice again: "Sir, that she-cow has deceived me, but, Sir, she was so plumpey."

* * *

Have you noticed how few statues in London commemorate the achievements of those connected with medicine? There are more than a hundred statues dotted about in the open spaces and thoroughfares of the metropolis, and they celebrate the distinction of royalties, statesmen, explorers, soldiers, sailors, scientists, authors, artists, philosophers, and, last and least in number, nurses and doctors. Lord Lister looks benevolently down Portland Place. Sir Hans Sloane dignifies the physic garden in Chelsea though his treasures glorify the British Museum, John Hunter's bust is back again in Leicester Square near the site of his anatomy school, and the sculptured features of Miss Aldrich Blake, that noble-minded surgeon, grace the dullness of Tavistock Square. Near Waterloo Place, Florence Nightingale stands close to the statesman who was the means whereby she achieved her purposes in the Crimean war, while those who walk north from Trafalgar Square past St. Martin-in-the-Fields will find inspiration in the nobly resolute figure of Edith Cavell. The visitor to Kensington Gardens can see Jenner seated in sylvan surroundings frequented by the children whom he did so much to benefit. That completes the medical statuary of London streets, and I must confess that Nurse Cavell's is the only one which awakens in me feelings of reverence.

Apart from the statue of Miss Aldrich Blake there is no witness to those who have made the last fifty years the most memorable in the history of medicine, surgery, and pathology. Does that mean that the public do not appreciate our profession at its true worth? I do not think so. Rather it is considered that a statue is a poor way of perpetuating a personality. It is a cold lifeless thing. Though there may be grace of limb or even dignity of gesture, though the features may be correct in line and accurate in proportion, yet the eyes are without expression and the complexion is the mask of death. The Greeks often put colour and gilt on their statues; that would at least give some touch of life, but our taste prefers the bare coldness of the uncoloured stone.

Even when the statue is worthy of its subject it is often erected where it is impossible to see it to advantage—on top of a column or on a high plinth—or in a place where to stand and admire threatens one with instant death from the busy traffic. No; give me a portrait which shows us the eyes in all their colour and vivacity and recalls the complexion and expression as they were in life.

* * *

There was a young psycho of Staines
Who plugged his aunt in to the mains
  Saying "Two hundred volts
  Should screw up her loose bolts
And prevent her undressing in trains."

* * *

As a patient I am impressed by my previous ignorance of nursing. The nurses are wonderful but the system—! It seems that any initial enthusiasm is to be discouraged, intelligent coöperation replaced by discipline, and the whole set in a caste system reminiscent of a public school with an ascending scale of privileges based on length of stay. I'm afraid this system has been its own downfall. Treating women like naughty schoolgirls was always poor psychology, but now that labour is so short and they know that elsewhere they will be treated as adults it is self-extermination.

venient and sometimes unworkable in the case of the borough and county hospital services, and it cuts through the natural catchment area of the most important hospital centre on the South Coast.

The voluntary hospitals of Brighton and Hove provide a complete hospital and consultant service of a high standard, which now serves an area with a radius of about thirty miles extending equally into East and West Sussex. The area is homogeneous and easy of access for patients and their friends, since trains and buses converge on Brighton. The hospitals on both sides of the border are in some cases served by the same consultants. To divide Sussex, as is proposed, would leave Brighton and Hove, the acknowledged medical centre of the South Coast, on the extreme edge of the region.

To those who know Sussex, with its great health resorts and thriving towns, this appears unfortunate, and the case for including the whole of Sussex in the South-east region is obvious. In the first place it would make the South-west and South-east regions more nearly equal in size; secondly, Kent and Sussex would be grouped conveniently round four centres—Canterbury, Tunbridge Wells, Chichester, and Brighton. Brighton in the centre of the South Coast, with its natural hinterland, is the largest of these and has the greatest number of consultants; it would be wasteful and short-sighted not to use it to its full extent.

From Kent.—Though large in its population (which must be close on 4 million), this is a region which is relatively compact and accessible. It is bounded by the Thames Estuary, the Channel, and the county boundaries with West Sussex and Surrey. Except only in London, where the borough of Lambeth has been divided—presumably to allow of the inclusion of King's College Hospital—no existing local-government boundaries have been transgressed. In the whole of the area there are only four county boroughs (Brighton, Canterbury, Eastbourne, and Hastings), and none of these boroughs has provided hospital services that it would prove difficult to integrate into a regional scheme. Radially there are ample and easy communications between London and all parts of the region. Cross-country journeys by rail between different districts are more difficult, but road linkage is more than adequate. The boundaries exclude no large areas that normally find their hospital provision inside the region; nor, with the possible exception of Beckenham and Penge, are any included that would ordinarily look elsewhere for their services. These two districts in Greater London are geographically part of Kent; but in practice they have an orientation more towards Croydon and east Surrey than towards north-west Kent. Their inclusion in the South-east rather than the South-west region should not, however, present difficulty, particularly with King's College Hospital available as a focus for their reorientation.

On all these counts the South-east seems a well-conceived and workable region, once one has accepted two postulates—that the regions shall be limited to 14, and that there shall be quadrisection of London. From a purely local point of view it is this division of London, and its attachment in quadrants to large sections of the home counties, that is likely to give rise to most of the early problems of regional planning. The division of London necessarily breaks up the unity of the municipal services already provided. Hospitals—particularly special hospitals—will be unevenly divided among the different sections, and it may not be possible for some time for each region to be self-sufficient.

Administratively there is a danger that the board in all its affairs will be dominated by London. In all five sections from which the board will be constituted—the university, the medical profession, the local authorities, the public, and the voluntary hospitals—London will loom large, and the more peripheral parts of the region will undoubtedly watch fearfully lest they are unable to obtain that degree of autonomy that might have been theirs had the region been smaller, or had it been a self-contained area looking towards, but not absorbed into, London. They will hope that the very size of the region will necessitate the delegation of real power to the management committees, and that through these committees they may still retain an extrametropolitan corporate entity.

A NEUROSIS CENTRE

THE L.C.C.'s hospital service, like that of oth authorities, has been hampered by shortage of nurs and domestic staff, and many of the buildings have bee destroyed or badly damaged. Sir Allen Daley, in h 1945 report,[1] says that for these reasons many patient evacuated during the war had not yet returned a the beginning of this year. Despite these difficultie however, he is able to record a number of positi achievements.

In May of last year a 350-bedded neurosis centre fo returned prisoners-of-war was established at the Souther Hospital, Dartford. Some of the patients had been i P.O.W. camps as long as five years, and they lacke the confidence to mix socially and succeed in civilia work. To restore this confidence they were sent out t work under local employers for short periods each day they were usually given unskilled work unless they wer tradesmen, and change of occupation was permitte once a week. At work they were visited by a vocational psychologist and a nurse, who was responsible for liaiso between the psychiatrist and the employer. The valu of this arrangement lay not only in the experience o various occupations but also in the opportunities fo association with healthy workmen. Men who were likel to be discharged from the Army were seen, within two weeks of admission, by a disablement resettlement officer of the Ministry of Labour. At a later interview, just before the man left hospital, the D.R.O., aided by reports by the psychiatrist and vocational psychologist, helped him to decide on his future employment.

Altogether 1202 patients were treated at the centre during the eleven months that it was in being. The results were good, perhaps partly because the men were on the whole excellent material and partly because every resource for treatment was at hand. The report suggests that with growing difficulties in finding employment as the labour market becomes more stable, an increasing number of patients will need vocational guidance. The establishment of a neurosis centre in collaboration with the Ministry of Labour is proposed. Here outpatients fit only for sheltered employment would be separated from those who might respond reablement.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED NOV. 30

Notifications.—Smallpox, 0; scarlet fever, 1383; whooping-cough, 1878; diphtheria, 301; paratyphoid, 19; typhoid, 3; measles (excluding rubella), 6005; pneumonia (primary or influenzal), 745; cerebrospinal fever, 47; poliomyelitis, 18; polioencephalitis, 1; encephalitis lethargica, 0; dysentery, 58; puerperal pyrexia, 130; ophthalmia neonatorum, 61. No case of cholera, plague, or typhus was notified during the week.

Deaths.—In 126 great towns there were no deaths from scarlet fever, enteric fever, or diphtheria, 2 (0) from measles, 8 (0) from whooping-cough, 64 (6) from diarrhœa and enteritis under two years, and 20 (3) from influenza. The figures in parentheses are those fo London itself.

The number of stillbirths notified during the week was 294 (corresponding to a rate of 30 per thousand total births), including 29 in London.

On Active Service

AWARDS

THE following appointments have been made in recognition of gallant and distinguished service in the field:

O.B.E.

Lieut.-Colonel G. T. M. HAYES, M.C., M.B. N.U.I., I.A.M.C.
Lieut.-Colonel P. W. KENT, M.B. N.U.I., I.A.M.C.

---

[1] London County Council: Interim Report of the County M Officer of Health and School Medical Officer for the Year 1 Obtainable from P. S. King and Staples Ltd., 14, Great Sm Street, S.W.1. Pp. 63. 2s.

I had thought it probable that postpituitary extract rted its antidiuretic effect chiefly through the tubular centration. However, normally the tubules in man concentrating urea, for example, to approximately ir maximum, and the urine excretion could not be uced to much less than 1 c.cm. per minute, as in the periments, without a reduction in the glomerular rate or a gross alteration in the tubular behaviour to non- and low-threshold substances.

It would be interesting to know how the glomerular rate and the tubular concentration separately varied ring the diuresis and its inhibition by emotion, renaline, and postpituitary extract. This could be imated for instance by determining the creatinine or ulin clearance (1) in the "resting" dog, (2) during inhibited water diuresis, and (3) in water diuresis hibited by adrenaline, emotion, partial compression of e renal artery, and postpituitary extract. It might possible in this way to distinguish between the echanisms of these antidiuretic factors.

BRIAN H. MCCRACKEN.

R.A.F. General Hospital,
St. Athan, Glam.

THE TITCHNER CASE

SIR,—Surely the world is going a little mad! In the cent Titchner case a child comes back from evacuation ith what are called "dirty habits." There is nothing ery peculiar about this, a distressing, tiresome, miserable ay of showing that you are out of joint with the world which you find yourself. After all, adults have headches and effort syndrome and colitis and get away ith it, and the child rather naturally displays its malontentment with a reversion to more childish ways. here have been hundreds of such cases. The majority f mothers after a period of alarm or anger and fruitless unishment seek advice, realising that while such ehaviour is "nasty" or "naughty" it still requires ome explanation, and failing an explanation mothers an only regard it as something about which they are gnorant.

In this case a hysterical wave of publicity colours the whole thing with a falsified glare, with a result that an ugly-looking crowd of men and women storm the house where this unfortunate child lived, and to show their protest at cruelty proceed to behave in a singularly cruel manner. One wonders how many of these same women would have considered it worth their while to call in and offer to advise Mrs. Titchner or take the child off her hands for a half day or even see if the local child-guidance clinic (and there is one) could give any useful advice. We don't seem to hear that anything of this kind, surely a natural reaction to a distressing situation, was ever offered or accomplished. Instead, still all in the name of mercy and justice, an entire family is broken up: a man and a woman are sent to prison, frantic with indignation. The rest of the children, who make no complaint, are sent to an institutional upbringing, about which we seem to have heard some rather harsh things said lately. But here comes the most remarkable feature of all—the unfortunate Jean is showered with toys, sweets, gifts of all kinds, and an embarrassing number of offers for foster-home care. Now everyone knows that it is the hardest thing in the world to find a good foster-home for child in need of one. People say the money isn't enough or that it is too much trouble or that their husbands wouldn't like it. Some of the children who need foster-homes are normal, happy children unlikely to be in any way as difficult as Jean Titchner, but the lack of good foster-homes constitutes one of the main reasons for having to allow children to grow up in institutions. However, in this case justice was done. Or was it?

How many people experienced in the care of children would care to be cross-examined on evidence obtained by questioning a child in the circumstances in which Jean found herself? How many stable children of her age could behave normally and respond normally in that glare of publicity? And we know from irrefutable evidence that Jean was not stable and couldn't adjust to normal family life. With the journalists sitting around over their morsels like carrion crows, we hear nothing of whether this child was observed quietly, living and playing with normal children. Only in this way could any real information be obtained.

There were times during the war when a display of public feeling was followed by an appropriate action. In this case the appropriate action seemed to be a desire to tear these ignorant and harsh parents limb from limb. Now the law has seen to it that they are punished, but it is difficult to see how separation from their family and imprisonment under protest can do very much to re-educate either of them to mercy and understanding.

It was once very appropriately said, "He that is without sin among you let him first cast a stone"; so now there should no longer be any difficulty in finding foster-homes for difficult children, at any rate in Camberwell. But will it have that effect? It seems to me that, as usual, the slate has been washed clean with the tears of humanity, but all to very little purpose.

London, W.1. MILDRED CREAK.

EPIDEMIC THROMBOPHLEBITIS

SIR,—Lieut.-Colonel Manson-Bahr and Dr. Charters (Sept. 7, p. 333) describe this condition in a number of patients, most of them suffering from venereal diseases. In favour of a virus origin, they found relative lymphocytosis, negative bacteriological findings, and a possible relation to infective hepatitis. Mr. Fisher and Dr. Lendrum (Sept. 21, p. 438), referring to a similar condition observed by them, describe a peculiar form of inflammation characterised by extreme proliferation of young capillaries in the disrupted media of the veins and by intracytoplasmic inclusions. Mr. Power (1946, i, 572) describes several cases of thrombosis of spermatic veins, and considers the ætiology obscure. This syndrome had been described as far back as 1908 by Aldo Castellani under the title "endemic funiculitis." All these vascular conditions were recorded in adults.

Thrombophlebitis and thrombo-angiitis of extremities in relation to lymphogranuloma venereum have been described by several authors. In a detailed study of arterial lesions in lymphogranuloma venereum we reported typical inclusions in damaged vessels.[1] Thrombophlebitis and thrombo-angiitis as single manifestations or subclinical forms of so-called non-specific epididymitis have been frequently observed by us in lymphogranuloma venereum (simple or associated urethrogenous penetration of the virus).[2]

In the cases studied in Africa and Ceylon by the British authors no mention is made of a typical inguinal bubo, because it did not exist, and therefore lymphogranuloma venereum was not investigated. With simple urethrogenous infection, or with simultaneous syphilitic or gonococcal infection, inguinal buboes may be atypical or absent.

When syphilis and lymphogranuloma occur together œdema of the prepuce is almost constant, thrombo-lymphangitis of the dorsal lymphatics of the penis or of the sulcus coronarius are very frequently present, and unilateral or bilateral deep iliac lymph-node enlargement is never absent. This last sign, which can only be found when sought, in our experience is almost pathognomonic of lymphogranulomatous genital infection.[3] In almost every such case the Frei test is positive, and microscopic findings in a very high proportion.[4] Rectal or buccal penetration of the virus must be kept in mind. General symptoms, such as fever, arthralgia, stiff-neck, &c., are not uncommon in lymphogranuloma venereum, which is a systemic disease.[5] In abortive or atypical forms (with absence of inguinal bubo) such symptoms seldom occur.

We have also observed epidemics of lymphogranuloma venereum, but almost always the source was found to be among prostitutes.

In 1934 we studied experimentally the possible importance of *Pediculus pubis* as carriers of the virus.[6] Skin over inflamed lymph-nodes is infiltrated and contains the virus, and antigens have been prepared from skin lesions. In 1939 Quintanilla-Braga[7] reported that pediculi might act as vectors of the virus.

W. E. COUTTS
Public Health Service.

Santiago, Chile.

---

1. *J. trop. Med. (Hyg.)* 1945, 48, 46.
2. *Nature, Lond.* Oct. 5, 1946, p. 487.
3. *Dermatologica, Bp.* 1942, 86, 369.
4. *Amer. J. Ophthal.* 1942, 25, 916.
5. *J. trop. Med. (Hyg.)* 1936, 39, 13.
6. *Urol. cutan. Rev.* 1934, 38, 263.
7. *Arch. Biol.* 1939, 23, 41.

Letters to the Editor

A MORAL PROBLEM

SIR,—Mr. Kenneth Mellanby states the case of those who believe that there is no inherent wrong in performing vivisection experiments on human beings without their consent, and perhaps in opposition to it. Alternatively he claims that those who would not do such things themselves are entitled to use knowledge gained thereby. He describes as "simply pernicious sentimentality" the opposite view that those who would use knowledge thus obtained are accessories after the fact and become responsible for the actions that gave rise to it.

He shows that there is no borderline at which to stop once the starting-point is passed. He classifies those who have done such experiments as "so-called scientists," "irresponsible sadists," and "serious research-workers." Yet who can say that everyone that works in a laboratory is an earnest seeker after truth, or that there never has been a vein of cruelty in any one of them? And has nothing been found in science except by those of "academic standing"? There is the same want of definition of those upon whom it is justifiable for such investigations to be done. It would seem that even after having accepted the idea that such persons "should be given the opportunity to serve as subjects for experiments" Mr. Mellanby must put in much hard thinking before he can draft rules under which a licence for such vivisection experiments might be granted.

With regard to the "results" of those which have already been done, Mr. Mellanby "would grade them as 'confidential' and make them available only to bona-fide investigators." But the great glory of science is that all knowledge gained by it shall be free to all the world. Is this to be set aside so that investigators classed, by some person or persons unknown, as "bona-fide" may have at their hand results of such research that possibly may be useful but which are hidden from the rest of the world? Useful to whom? To still more investigators? Or to us who are clinicians? We are scientists in that we must use the results of science in our pursuit of the art of healing. For this we must use our critical judgment. We must decide for ourselves whether the work of the investigators is good work and whether it is such that we can confidently recommend it to our patients or try it on them. To exercise this judgment we must have the whole story.

No! If this material is to be touched, it must be published in full. Then and then only shall we be able to judge how much there is of value in it. Then also shall we know the full story of the bestiality under which some, at least, was done, and be able to weigh the rest in the light of this.

Far better however would it be for the whole to be destroyed uncopied and unrecorded, as was indicated in the novel by Miss Josephine Bell to which you have already referred. This book tells of a certain hospital in which a number of persons had died mysteriously. The suicide of a member of the staff brought to light that these deaths had resulted from his injecting patients in a study of anaphylaxis which was then the problem of the day. His "work" was nearly finished. A meeting of the staff was called to decide what should be done with his records which they had before them on the table. One member—a pathologist—urged that they must be given to the world as they were of great importance. But the chairman—a clinician—held the opposite and swayed the meeting to his view. The papers were destroyed in the presence of them all. The words, quoted by you on Nov. 30, that Dr. Bell puts into the mouth of the senior physician will bear repeating: "May I remind you that our duty to our neighbour, our fellow man, comes before even our interest in science?"

T. B. LAYTON.

London, S.E.1.

SIR,—Dr. Mellanby's letter is a warning to those who say "it couldn't happen here," and of the dangers of being a "keen research-worker" with "little contact with the world outside his laboratory," and of "believing whatever his government tells him."

A. NELSON-JONES.

London, S.W.15.

THE ACT

SIR,—The controversy which is at present ragin about discussions with the Minister of Health has mad me ponder over the factors which would appeal both t the public and to the medical profession as evidence o an earnest wish on the part of the Minister, or a definit promise for better health and better treatment for th sick.

From the point of view of the public this would impl a levelling up of the treatment, especially among the les well-to-do, so that invalidism should be as short as possibl and recovery as complete as possible, while the illnes itself would be made as little unpleasant as might be.

On the preventive side of health we should first conside better houses and more houses in order to lessen overcrowding; better conditions of work with much les exposure to various industrial risks; and all thos measures which will provide better food and safer drin for everyone. It is of course extremely important t cater for adolescent and adult education, so that the greater leisure which machinery will bring can be usefull employed by all.

For the doctors there are many important factors, th first and the greatest of which is the increased facilit for acquiring a real knowledge of professional work s that each doctor may be able to treat his patients better This will largely mean help in various directions, includin (1) aids to diagnosis, and (2) help in treatment, which—whether the treatment be carried out in the patient's home or in an institution—means for the patient the ready acquisition of nurses, masseurs, and domestic helps, and for the doctor domestic helps, stenographers, and an attendant nurse. In hospital practice we need more beds, more domestic staff, more nurses, more porters, more stenographers, and more technical assistants, so that not only may the treatment be carried out more efficiently but everyone may have more time to devote to the care of the sick. This would make the work easier and would enable the doctor to get through his work more comfortably and to have leisure both for physical exercise and for reading, so that he would find it much simpler to keep up to date in his professional work, and at large would do his work better and under better conditions.

At present the doctor in hospital, and the practitioner doing general practice, works long hours, usually more than twelve hours a day. He does not get free weekends, for patients are ill both on Saturdays and Sundays, and he can never be sure of a night in bed.

Now the Act does not hold out any promise, either in the immediate or in the remote future, of providing any of the things which have been discussed; indeed the name of the Act is a misnomer for as it stands at present it is merely a measure for the nationalisation of the medical profession. The coördination and the control and the direction of the practice of medicine in all its branches will become more complete, but the patient is offered nothing. Even if the Act were to double the doctor's remuneration it would be unwelcome to the good doctor because it does not give him a chance to do better work under better conditions. The Act merely suggests more work for all and less rather than greater efficiency.

K. DOUGLAS WILKINSON.

Birmingham.

ABSORPTION AND EXCRETION OF WATER

SIR,—Prof. E. B. Verney's article (Nov. 23 and 30) throws considerable light on problems of variations in renal excretion.

He has endeavoured to demonstrate in dogs that the inhibition of diuresis by postpituitary extract contrasts with that of adrenaline because it produces a different graph of excretion; and he implies that adrenaline acts by reducing renal blood-flow, which is little affected by postpituitary extract. The suggestion is that normal physiological variations in urine flow are achieved by variations in posterior pituitary secretion.

Urine flow can be varied by one of two mechanisms: (1) the reduction of glomerular filtrate, and (2) water reabsorption by the tubules—i.e., tubular concentration. It is apparent that in diuresis due to decreased posterior pituitary secretion tubular concentration is diminished, since the concentration of solids in the urine diminishes;

hypertensive types. (Do acute tuberculous patients er have arteriosclerosis?)

Mr. Sampson Handley (Nov. 30) speaks truly of thology as necessarily dealing with "the body working a whole." He has seen 2 cases recently in which ronic cholecystitis preceded heart trouble. In the last ree days I have examined 3 subjects of sudden death. The first died two hours after taking ill: he had 8 pints of eural fluid, a heart weighing 27 oz., and a distended and flamed gall-bladder with adhesions. The second, said to ave been asthmatic, died four hours after taking ill; the eart weighed 28 oz., there were small white kidneys, and a all-bladder, very large, nearly black, and containing about 0 small stones like blackcurrants and 1 larger one impacted the cystic duct. The third had 6 pints of pleural fluid, a eart weighing 22 oz., advanced calcareous and atheromatous isease of the aortic ring and valves, and a malignant ulcer on he foot with secondaries in the inguinal glands, lung, and kidney; the gall-bladder had numerous adhesions around it. All these cases had coronary artery disease but no complete occlusion. Though they were obviously cases of chronic toxæmia there was no thrombosis. I do not know whether the infective agent was a staphylococcus.

Worthing. W. O. PITT.

SIR,—I should like to join in on the side of Mr. Sampson Handley (Nov. 30), and support his view that coronary disease is more probably due to chronic bacterial infection than to the "strain of modern life." Leaving aside the particular example of chronic cholecystitis and cardiac disease, of which I too have seen several examples, and also the cases of gall-stones erroneously diagnosed as coronary attacks, I would point out that the increased red-cell sedimentation-rate and the leucocytosis in coronary occlusion suggest the infective nature of the condition.

London, W.1. G. E. BEAUMONT.

SIR,—We are not likely to understand angina pectoris until we cease to regard it as a consequence of arteriosclerosis. For more than 25 years I have argued that arteriosclerosis is not a disease but a healing mechanism.[1] The disease whose ravages it repairs is arterial atony; in the atonic condition the arteries are damaged by circulatory stresses, and this damage is healed by calcification—a process analogous to the healing of tuberculous lesions or hydatid cysts. The first stage is the deposition of a plastic mass containing cholesterol, and subsequently calcareous matter is formed. The sclerosis is in fact a protection of the weakened arterial wall. All the suggested causes of arteriosclerosis—infections, intoxications, and physical and psychological influences—are conditions which first of all give rise to arterial atony.

Arteriosclerosis, usually with coronary calcification, has been found post mortem in 50% of war casualties between 20 and 30 years of age; yet these subjects had not suffered from angina pectoris. The fact that the proportion of deaths from arteriosclerosis is only 6% suggests that it is usually arrested, and that it is in fact curable. Its increased incidence in recent years and its prevalence among those who bear special responsibilities should provide a clue to prophylaxis.

London, W.1. J. PLESCH.

PSYCHONEUROSIS TREATED WITH ELECTRICAL CONVULSIONS

SIR,—In reply to Dr. Chapman, may I point out that I have neither said nor implied that *intensive* electro-convulsive treatment, as used by Dr. Milligan, is ethically right when applied to sufferers from melancholia. I said that convulsive therapy seems likely to take a permanent place in the treatment of melancholia (Nov. 16).

I would agree with Dr. Chapman that if in a case of psychoneurosis all the symptoms are removed, and the patient is made cheerful, coöperative, and happy, his psychoneurosis may be said to be cured, even if, as he says, there be a slight intellectual deterioration after treatment; but there is no satisfactory evidence in Dr. Milligan's paper that his patients were made cheerful and happy, and I would like very much to know how often the patient and his friends were warned before treatment that it might possibly be followed by slight intellectual deterioration.

London, W.1. J. NORMAN GLAISTER.

REGIONAL BOARDS

SIR,—"Your Correspondent of Nov. 9" in his letter of Nov. 30 points out clearly the danger of a medical-chief administrative officer. He has to my mind struck at the crux of the problem.

We have in Britain in the municipal system experienced the defects and failures of two chief medical administrative officers—the medical officer of health, and the *medical superintendent* of general hospitals. And we should do well to remember the lessons that such a system has taught us. A half-hearted attempt has been made recently by a few local authorities to infuse a little democracy in their hospital systems; but it has not amounted to much. The title of medical superintendent has been changed to medical director, and a medical staff committee has been set up. But what is grudgingly given away with one hand is taken away with the other, for the medical committee's advisory powers are either counterbalanced or cancelled out by those of the medical superintendent or medical officer of health, sometimes acting in unison, at other times separately. Moreover, these two executive officers always have the last word, and always have the ear of the chairman and members of the committee of management at the convenient and strategic moment. F.R.C.S.

EXERCISE AND CARDIAC HYPERTROPHY

SIR,—More than 25 years ago I remember the late Dr. Strickland Goodall saying, during one of his physiology lectures, that no-one whose heart did not show hypertrophy could hope to be a successful athlete.

Only recently I read a veterinary surgeon's opinion that lack of stamina and sudden death of horses in the hunting field were due to the out-of-season walking exercise which, though admirable in itself, did not produce cardiac enlargement, and that a hard daily gallop should be included to produce this effect. It would be interesting to know if there is any record of a schizophrenic (whose heart is always small) ever having been successful in long-distance or strenuous athletic events.

Keighley. WRIGHT LAMBERT.

LEFT TURN

SIR,—Dr. Brian Kirman's letter of Nov. 30 emphasises a fact which we older doctors and people in general do not appreciate. Dr. Dain and all of us around his vintage have experience of two different worlds—pre-1914 and post-1914. We know something of the freedoms, incentives, individual enterprise, and contentment (aye, even among the poor) of the earlier world; a world of good manners and gentility, and politically a world of social reformists. We also know the world of bad manners, low morale, general poverty, general discontent, and social revolution. We are therefore in a position to judge which is the better.

The younger men have only experience of a disturbed world, and not unnaturally want to improve it; with the spirit of speed in the blood they want to cure all the evils at one blow; and I think they really believe they've got the answer in Communism. The really inspiring efficiency of totalitarian war organisation, they believe, can be carried into a world at peace; and they are encouraged in it by men who have material axes to grind.

Dr. Kirman hopes to see us assessed by the public at our true worth to it. That is exactly what we are fighting for. The new proposition is that we be assessed by the Minister of Health; and when we are nationalised it is we who will assess the public, not it us.

St. Osyth. R. E. CLARKE.

SIR,—Dr. Kirman should try to remember that there are quite a number of good doctors who are quite as common as himself, in the inverted-snob, or proletarian, sense of the word, and yet who still wish to retain a measure of that individuality which has characterised our race, and which is not to be found in politically less evolved peoples. We just don't want, and in fact will not be press-ganged and highjacked into working for, a rapidly developing totalitarian State; and we only ask to be left to work, as always, as hard as we can, but where we want, and with whom we want; governed only by the unwritten but clearly understood ethical rules of our great profession, and answerable only to our patients, rich and poor alike.

London, W.1. GEOFFREY PARKER.

---

[1] Plesch, J. *Lancet*, 1932, i, 385.

HEALTH CENTRES

Sir,—Last March, in drawing attention to a series of articles on Health Centres of Today, you said that you hoped to follow this with a further series on Health Centres of Tomorrow.

Sometimes the best of plans cannot be fulfilled, and the detailed work of collating material on such a new and complex topic as the “health centre” is likely to take up many precious hours. Nevertheless I feel sure that The Lancet will *not fail us on this crucial question*—the keystone of the National Health Service Act.

Time does not wait. The announcement of the regional areas for the regional hospital boards means that the Minister will not wait either. No single medical or political body of any standing has put forward concrete plans on the character of or the detailed content proposed for the health centres. Why is this so? If the Minister is not presented with considerable plans in an advanced state of maturity, how can he act wisely? Discussion around the fundamental principles governing the construction of a health centre has not even begun in the medical journals. I appeal to The Lancet to meet this crying need, as it has promised to do, and to meet it quickly.

London, S.E.12. P. W. Roe.

⁂ We hope to fulfil our promise early in the New Year.—Ed. L.

SYNDROME SIMULATING ACUTE ABDOMINAL DISEASE

Sir,—During the last three months we have seen 10 patients with symptoms the same as those described by Mr. Goldstone and Dr. Le Marquand (August 24, p. 267). The ætiology and pathology have, however, been differently interpreted.

These patients, British soldiers between the ages of 18 and 25, were admitted with a history of recent sudden onset of severe sharp pain in the right hypochondrium, worse on breathing. In half of them the pain radiated to the right shoulder, and in 2 also to the left hypochondrium. Except for slight general malaise there were no other symptoms. The temperature was 100–102° F, and the pulse-rate 90–100 per minute; the respiratory rate was not significantly increased.

On examination the only positive findings were slightly diminished movement and air entry in the right lower zone of the chest, and marked tenderness and guarding in the right hypochondrium; in 3 cases deep palpation in this area caused pain in the right shoulder. The upper part of the right rectus muscle was in spasm, and the tenderness appeared to be in the muscle itself rather than in the underlying structures. In 4 a localised, transient, but unmistakable pleural rub was heard in the right lower zone of the chest 1–3 days after admission. The rub lasted for 12–48 hours. After the initial pyrexia, which lasted not longer than 2 days, there were no further general symptoms, and the pain disappeared in 5–7 days.

Of these patients, 6 were admitted with a provisional diagnosis of acute abdominal disease and were thought to be suffering from acute cholecystitis, acute appendicitis, or a perforated peptic ulcer. There were, however, no other symptoms suggesting abdominal disease, and peristaltic sounds were always well heard. This emphasises the similarity between our cases and the patients with the “new abdominal syndrome” described by Goldstone and Le Marquand.

The investigations on each patient included examination of the urine, radiography of chest, white blood-cell count, and blood-sedimentation rate; no abnormality was detected.

In view of the symptoms and signs, especially the pleural rub, it is considered that the condition of these patients was akin to the benign dry pleurisy described by Scadding. In our series, however, it was the right lower parietal and the right diaphragmatic pleura which was chiefly involved. Furthermore, in view of the muscle tenderness, it would appear that the connective tissue of the muscles was also affected. Thus benign dry pleurisy and so-called epidemic myalgia are brought into the same symptom-complex, and it is suggested that the two conditions are in fact differing aspects of the same pathological process.

We do not think, therefore, that the symptoms i cases, in which the clinical picture was so similar, be caused by “abortive forms of perinephric sta coccal infection,” as suggested by Goldstone Le Marquand in their cases. We suggest that *clinical syndrome is caused by an inflammatory pr* probably of virus origin, affecting the pleura and ot connective tissue. The pain and spasm in the mus would thus be due to local changes and to refe impulses along the intercostal nerves irritated by inflamed pleura. Why this condition should m affect the right side is a question needing fu elucidation.

E. L. Frankel.
P. B. S. Fowler.
M.E.L.F. P. F. Borrie.

CORONARY DISEASE

Sir,—Each year I examine post mortem a considerabl number of persons who have died more or less sudden most of them are elderly—upwards of 60. It is rare t see one that has not some coronary artery disease, ev if that has not been the cause of death. It is not unc mon to see this condition at any age after childhood. an average I examine one subject a week who h died suddenly from coronary artery disease, with eit complete or nearly complete occlusion of the artery.

I am therefore very interested in Sir Maurice Cassidy Harveian oration; but I feel that it perpetuates a unfortunate confusion of terms. After speaking o “coronary disease” he goes on to talk of “angin pectoris,” and then of “coronary thrombosis.” H pleads for the abandonment of the terms “angi minor,” “angina innocens,” and “pseudo-angina saying that either the patient has angina or he has n He attributes the angina to ischæmia of part of th myocardium, usually the result of coronary ather sclerosis with or without coronary thrombosis or subliminal hæmatoma. (Here we have three new terms *He suggests that severe anæmia* alone, or probably wit some degree of atherosclerosis, may cause anginal pain and then he mentions the possibility of spasm of healthy coronary artery as a cause of coronary pain (Is this angina?) But he adds that physical examina tion may be surprisingly negative till coronary dis declares itself by the patient's sudden death. Su vasomotor angina occurs, he believes, without physi signs of cardiovascular disease and with a normal electro *cardiogram, and sometimes* with vasomotor instabilit flushing, or migraine. Later he begins to use the ter “coronary occlusion,” and thereafter talks regular of “coronary disease” and “coronary occlusion” wi one lapse to “coronary thrombosis,” though referri to the sudden deaths of miners in a certain series as d to “coronary atheroma.”

To overcome this confusion of terms I offer the follow suggestions:

1. Let “angina” be dropped altogether, or used only indicate a symptom.
2. Let “hypertension” likewise be used only to indicate physical sign. (It must always be due to increased resista to the flow of blood through the arteries.)
3. Let “coronary thrombosis” be dropped altogether as cause of death. (I have never seen a case in which dea was clearly due to thrombosis. When there is a thromb —and thus is rare—it is always in front of a mas degenerative matter.)
4. Let cases be described as “coronary occlusion,” parti or complete. (Due to accumulation of atheromatous calcareous matter, or commonly both.)
5. Let this be recognised as merely a local intensification of general arterial disease or degeneration. (Similar to cereb hæmorrhage or cerebral arterial occlusion—also erroneous called cerebral thrombosis—aneurysm of an artery, a perhaps some forms of migraine.)

If all these conditions were recognised as spec manifestations of arterial disease, their ætiology an prophylaxis would cease to be the exclusive province the cardiologist and neurologist. Investigators cou then concentrate on the causes of arterial disease, whi may prove to be some long-continued toxæmia, and mig thus be brought into line with other chronic toxæmi as in rheumatoid arthritis. It is an interesting possibili that there is an antithesis between the tuberculous a nurses and the domestic staffs engaged in tuberculosis ospitals.—Mr. J. STRACHEY replied: I am assured by my edical advisers that there are no medical grounds for granting xtra milk to nursing and domestic staff in tuberculosis anatoria.

Shared Staff

Mr. R. W. SORENSEN asked the Minister of Health, in view of he understaffing of nurses in some hospitals and the relative verstaffing in others, whether any consideration had been iven to the possibility of the temporary transference of members of the more fortunate hospitals to the less fortunate. —Mr. BEVAN replied: Some help is being given by the better-taffed hospitals on a voluntary basis, but nurses are no longer ubject to direction.

Birth Certificates

Replying to a question, Mr. BEVAN stated that he hoped o introduce this session a short Bill making it possible, as in Scotland, to issue, at a reduced fee, shortened birth certificates and also shortened extracts from the Adopted Children Register which will contain no reference to parentage or adoption.

Fluorine Hazard

Mr. C. WILLIAMS asked the Lord President of the Council e was yet in a position to say if the report on the fluorine ard near Port William would be published—Mr. HERBERT ORRISON replied: Yes, Sir, as soon as it is available

Chemical Standard for Ice-cream

Wing-Commander ROLAND ROBINSON asked the Minister f Food whether he would take powers to define a minimum hemical standard for ice-cream of at least 4% fat content, while retaining powers to review this standard when more at products were available.—Mr. STRACHEY replied: I should ike to fix a minimum standard for ice-cream; but I think his must wait until the supply of the necessary ingredients as improved For one thing I should not like to start with o low a standard as that referred to, and also fat is not the nly important ingredient in good ice-cream.

Atomic Research and Thames Water

Sir RALPH GLYN asked the Minister of Supply if he could make a statement in regard to the nature and condition of he water to be returned to the Thames after having been sed at the Atomic Energy Research Station, Harwell.—OHN WILMOT replied: All water returned to the Thames will comply with purity standards fixed by the Medical Research Council and already agreed by the other authorities oncerned. Most careful arrangements will be made to guard against any accidental discharge of radioactive water into the Thames.

Mr. WALTER ELLIOT, who last week took his seat in the House of Commons as M.P. for the Scottish Universities, is well fitted to represent a university constituency, for he is a graduate in science and medicine of the University of Glasgow, an honorary graduate of Aberdeen, Leeds, Edinburgh, Manchester, and South Africa, and has been rector of Aberdeen University He qualified in medicine in 1913, and during his service with the R.A.M.C in the first world war he was awarded the M.C. and bar In 1918 he first entered Parliament and five years later he was appointed under secretary for health for Scotland. Since then (till the last election) he has sat continuously in Parliament and has held many high offices. In turn he has been under-secretary for Scotland, financial secretary to the Treasury, Minister of Agri-lture and Fisheries, Secretary of State for Scotland, and om 1938 to 1940 Minister of Health During the late war, th the rank of colonel, he was for a time director of public lations at the War Office. He was elected F.R.S in 1935 C.P. in 1940. He is one of the founders of the new ociation of Agriculture, which happily reflects his interest th in the nutrition and health of the people

Drummond Young

Obituary

WILLIAM MURRAY HONEYMAN

M.B., B.SC. ST. AND., M.R.C.P.

Squadron-Leader W. M. Honeyman, who died on Nov. 24, entered St. Andrews University as first bursar, and graduated B.SC. in 1932 and M.B. with commendation three years later. After holding two house-appointments, he was awarded a Commonwealth fellowship and studied at Columbia University and at the Phipps psychiatric clinic in Baltimore. On his return from America in 1939 he was admitted to the membership of the Royal College of Physicians and became Halley Stewart fellow in the Medical Research Council's unit at Queen Square. At the end of the same year he joined the volunteer reserve of the R.A.F., and on mobilisation was seconded for duty to the psychological department of Cambridge University, where he worked on problems of applied neurology and psychology in aviation medicine till his tragically premature death.

"One could only admire in silence," writes D. D. R., "the fortitude and courage which sustained Willie Honeyman, so that even when his life was clearly on the ebb, he turned out reports illumined by all the clarity and insight of his fine intellect. Much of his work, for example his researches on after-contraction, was fundamental, but as he showed in his brilliantly ingenious study of the manipulative results of changes in the positioning of aircraft controls, he could respond to the challenge of an immediate practical problem. Had he gone on to full maturity he would certainly have justified the rich promise of his early career. Those of us who knew him well enough to appreciate the warm humanity which he disguised by a dry whimsicality, will remember him not only for his gifts of mind and heart but also for his intellectual honesty. He tolerated no scientific chicanery or humbug, and his merest nod of approval was praise indeed. For all this, and most of all for the inspiration of his conduct in the face of adversity, we shall be always grateful."

ALEXANDRINA MATILDA MACPHAIL

O.B.E., L.R.C.P.E.

Dr. Matilda Macphail, who died at her home in Edinburgh on Nov. 6, was a daughter of the manse, born in the Island of Skye in 1860, and to the end of her life she retained the slow, soft, pleasant intonation of the West Highlands. After studying medicine at the London School of Medicine for Women, she obtained the triple qualification in 1887, and went to India in 1888 as the first woman medical missionary of the Free Church of Scotland. After some years of pioneer work in Madras she founded the Christina Rainy Hospital, where most of her work was subsequently carried on, though the exercise of her skill often took her to the farthest parts of the Presidency. She also for a time supervised the work of the hospital at Conjeveram, and was active in the founding of the Union Mission Tuberculosis Sanatorium at Madanapalle. She was much interested in the Medical School for Women at Vellore, and after the 1914–18 war assisted for a time in the teaching there. Having been unable to obtain a passage back to India during the war, she offered her services to the Scottish Women's Hospitals, and in 1917 acted as chief medical officer of the Manchester unit for Serbian refugees in Corsica. Later, in 1918, she organised for the Scottish Women's Hospitals their tuberculosis sanatorium for Serbian soldiers at Sallanches in the Haute Savoie.

She retired from her long period of active missionary work in 1929. In recognition of her work in India she was awarded the Kaisar-i-Hind medal in 1912, with a bar in 1918, and the O.B.E. in 1930.

Although often hampered in the course of her life by physical disabilities Dr. Macphail never spared herself, and worked with untiring energy. She was greatly beloved and respected by a large circle of patients and friends, Indian and European, in whom she maintained a warm interest to the end of her life. She died after only a few days' illness, and not long before her death at the age of 86 she was able to travel south to visit friends in London.

B. R.

Parliament

FROM THE PRESS GALLERY

Care of Young Children

ON the motion for the adjournment on Dec. 6, Dr. **BARNET STROSS** declared that in his view provision for the care and education of young children under five had worsened as compared with the admittedly makeshift arrangements made during the war. The subsidy for the training of assistants under the Child Care Reserve had ceased; for some time trained nursery teachers had not been available, and equipment was not so good. But even the finest nursery, Dr. Stross continued, could only be a complement to, and never a substitution for, a home. In peace-time, he thought, we had no right to ask mothers of children under two to go into factories. Dr. **STEPHEN TAYLOR** quoted papers from the medical press showing that the incidence of respiratory infection and the absentee-rate in day nurseries for children under two was very high. Many children also did not gain weight satisfactorily. Children of that age, he felt, needed continuity of care, and in nurseries a change of worker from time to time was inevitable.

Mr. **SOMERVILLE HASTINGS**, F.R.C.S., suggested that though there was a great place for day nurseries and nursery schools in the future, children should spend only half their time there. Let the child go to the nursery while the mother was occupied with her household duties, but for the rest of the time the child should have the undivided attention which he claimed and needed. Mrs. **JEAN MANN** urged that a healthy happy mother was best employed looking after her own children, but added that she would like to see the nurseries extended to take in the children of mothers who were ill or being confined.

Mr. **C. KEY**, in his reply, stressed that in the development of these war-time nurseries the motivating force had been industrial, but under normal peace-time conditions the Government believed that the right policy was to discourage mothers of children under two from going out to work, to make provision for children between two and five by way of nursery schools and classes, and to regard day nurseries and daily guardians as supplements to meet special needs. But until normal times came, and while the needs of the home market and export had to be met, provision must be made for the children of mothers who were willing to go out to work. The welfare and local education authorities, after reviewing the needs of their areas, had continued 916 nurseries under their maternity and child-welfare powers as ordinary day nurseries, had converted 300 into nursery schools, and had closed just over 100. The Government were aware of the need to improve the training arrangements and to raise the status of nursery nurses, and all nurseries were being inspected in this connexion and they were about to review the salaries of nursery workers. Fifty ex-Service girls were being trained as nursery nurses under the vocational scheme of the Ministry of Labour and more were to follow. But there was, Mr. Key admitted, a shortage of staff, for one attendant was needed for every five children. The opening of nurseries in factories without reference to the welfare authority presented them with another problem, and he emphasised that it was not easy to adapt a war-time service of this kind to peace-time needs. He believed that the proper way of dealing with the children of mothers who were ill was by developing a system of home helps.

Priority Milk

On Dec. 3, on the motion for the adjournment, Dr. S. **JEGER** suggested ways in which the allocation of priority milk might be improved. The categories in the schedule for priorities were, he thought, too vague—dyspepsia and colitis, for instance, might mean almost anything, while other diseases, such as the anæmias, were absent. Industrial workers who were confined to bed should also, he believed, get some priority milk during the first ten days of their illness. He also pleaded for small families, old people who lived alone, and convalescent industrial workers. Certificates could now be given for either 14 pints or 7 pints a week. Could there not, he asked, be a new category of 3½ pints for such people as ambulatory gastric-ulcer and tuberculosis patients? Gastric-ulcer patients who received 2 pints of milk a day should, he thought, forfeit their meat ration. It would be easier for doctors if instead of giving the patients certificates for milk they gave statements of illness could be taken to the food office, where the decision whether milk should be granted would be made. D... cases could be submitted to a panel of doctors not in general practice.

Dr. **E. SUMMERSKILL**, in reply, pointed out that the priority categories had been established on the advice of the special advisory committee of the Medical Research Council and that they accounted for about 6% of the total consumption of milk in the country. She appreciated the difficulty the general practitioner sometimes had in refusing a certificate, and she thought that if a new category of 3½ pints were introduced it might seem to the doctor an easy way of moving a patient off the chair in the consulting-room, but they would certainly consider the suggestion. The gastric-ulcer patient if given the alternative between milk or meat would be constantly changing according to the state of his health. She regretted that it was impossible to adopt the suggestion of a committee to decide on eligibility for milk. No more work could be put on the food offices, and they would have to continue to leave the general practitioner to decide.

German Rations

The Chancellor of the Exchequer, in announcing the economic fusion of the British and American zones in Germany, said that the food ration of 1550 calories for the normal German consumer must be accepted for the present, but would be raised to 1800 calories as soon as conditions of world supply permitted.

QUESTION TIME

Closed Shop

Mr. J. A. **BOYD-CARPENTER** asked the Minister of Health what action he was taking to prevent the breakdown in hospital services threatened as a result of the action of the Willesden Council in directing that all nurses at their hospital who do not join a trade union will be dismissed.—Mr. A. **BEVAN** replied: I am sending a circular to local authorities pointing out that their primary duty as health authorities is to maintain the efficiency and smooth running of their health services and ensure the welfare of the patients for whom they are responsible. All other considerations must be regarded as secondary. While I am anxious that doctors, nurses, and members of similar professions should join a trade union or appropriate professional association, this is a matter which should not be determined by unilateral action of local authorities.

Dental Settlement?

Mr. J. **BAIRD** asked the Minister of National Insurance whether he was now in a position to make any statement about the dispute as to the terms on which dentists should undertake National Insurance work.—Mr. J. **GRIFFITHS** replied: A settlement has been reached on which the Joint Advisory Dental Council are recommending the profession to resume the dental benefit service forthwith. The terms of settlement, which the Government, the leaders of the profession, and representatives of the approved societies have agreed are fair to all parties, are as follows:

> As soon as the report of the Spens Committee on dental remuneration is available there will be negotiations between the Government and the dental organisations to agree in the light of the report two things: the method and order of remuneration of dentists in the National Health Service, and an appropriate scale of fees for work done under the present limited dental benefit scheme.
>
> If the scale of fees so arrived at shows that the present one was inadequate to meet the just claims of the profession, the Government will seek parliamentary authority for making payments retrospectively to dentists calculated to meet the difference between the amounts due to them for work paid for on the present scale from a current date and what they would have received had that work been done on the scale to be agreed.
>
> Pending the completion of these negotiations the scale of fees introduced by the Government on Sept. 30 will continue in force and will determine the payments to be made by insured persons entitled to dental benefit and by their approved societies.

Extra Milk for Sanatorium Nurses

Mr. E. A. **HARDY** asked the Minister of Food whether he was aware that nurses engaged in tuberculosis hospitals were not allowed a supplementary milk allowance except when nurses were suffering from tuberculosis themselves; and if he would arrange for a supplementary allowance to be given

itish Standards Institution

The 1946 yearbook gives a subject index and a synopsis of 1300 current British standards. The book is obtainable, ce 2s., from the institution, 28, Victoria Street, London, W.1.

nproved Water-purifying Tablets

The United States Army has been experimenting with ethods of individual water purification to replace the lorine-type tablet Triglycerine hydroperiodide has been und to answer to the requirements: quickly dissolved, safe, d effective, it can be used under a wider range of conditions, d causes a less objectionable odour and taste, than chlorine. rther trials with it will be made in the coming year.

onvalescent Home for ex-Servicemen

The British Legion convalescent and holiday home at hurchill Court, Sevenoaks, with accommodation for 50 x-Service men and women of the 1939–45 war, is now perating fully. The home is intended for those in need of:) convalescent treatment after a severe illness, or (2) a rtnight's holiday to prevent a breakdown in health. Applica-on should be made through the local British Legion Service mittee, or the British Legion and United Services Fund evolent Department, Pall Mall, London, S.W.1.

sociation of Industrial Medical Officers

A meeting will be held at the London School of Hygiene nd Tropical Medicine, Keppel Street, W.C.1, on Friday, an. 24, at 4 P.M. At 5 P.M. there will be a joint meeting with the chool medical service group of the Society of Medical Officers f Health, at which a discussion on the Change from School o Industry will be opened by Dr. A. A. E. Newth and Mr. D. T. A. Lloyd-Davies. At 10.30 A.M. on Saturday, Jan. 25, Mr. R. H. Young will give an address, illustrated by a film, n the Diagnosis, Pathology, and Treatment of Intervertebral Disks.

Dental Controversy Ended

The Joint Advisory Dental Council has recommended dentists to resume N.H.I. work forthwith. The statement by the Minister of National Insurance (reported in our Parliamentary columns) shows, says the council, "that the Government are fully prepared to accept an adequate scale of fees and to regard payments under the scale imposed by the ter as instalment payments only; that they are willing to negotiate what the fees should be as soon as the Spens Committee report is available; and that payments under any agreed scale will be made retrospective to the date of settlement." The council has been assured that the basis of settlement will not in any way prejudice negotiations on the method and order of remuneration under a future National Health Service.

New Operational Ration for the U.S. Army

Tests on American Army personnel have shown that men engaged in mountain climbing and mountain field work (described as moderate activity) expend about 3400 calories a day. This has prompted the U.S. Army to increase the "E" ration, which is intended for operational use over a period not exceeding 21 days, from 3331 to 3800 calories a ay. The new ration, weighing 5 lb. $3^1/_2$ oz., is composed of cans, 1 accessory packet, and 1 packet of 20 cigarettes with book of matches. The cans consist of 3 meat units of 12 oz. ach (there are 10 varieties); 2 biscuit units; 1 fruit unit h 4 varieties); and 1 bread unit, containing 4 oz. of bread. In the accessory packet are chewing-gum, n-opener, salt, wooden spoon, tablets for purifying drinking-ater, and tablets for heating the rations.

evision of Geneva Convention

A preliminary conference, attended by 141 delegates of orty-five national red-cross societies and by the League of Red Cross Societies, to revise the Geneva Convention, was eld at Geneva from July 26 to August 23 under the presidency f Monsieur Max Huber, president of the International Red Cross Committee. It was resolved to alter the wording of the convention so as to make it applicable to any outbreak f international hostilities, with or without a formal declaraion of war, and to civil war. It was also decided to extend he convention to cover all aspects of naval warfare, including he tonnage, routeing, and signals of hospital ships. Other mendations were to extend the protection of the red-oss flag to civilian sick and wounded, and to civilian hospitals countries at war; and to form non-military zones for the eatment of sick and wounded in such countries.

Airborne Medical Society

It has been decided to enlarge the membership to all medical and dental officers who are eligible for membership of the Airborne Forces Club, so that all medical and dental practitioners whose business it was or is to go to war by parachute or glider may now join the society. Quartermasters and transport officers of airborne field ambulances are also eligible. Application forms may be obtained from the hon. secretary, 63a, Belsize Park Gardens, London, N.W.3.

Maudsley Institute

The London County Council has approved in principle the recommendation of the Goodenough Committee that the Maudsley Hospital medical school shall be incorporated as a separate institute from the hospital within the British Postgraduate Medical Federation. Though a constituent of the federation the institute will have its own governing authority, academic council, and dean, and will be autonomous. But it will be financed from the University Grants Committee through the University of London on the recommendation of the federation. The L.C.C., except for its representation on the committee of management, will have no voice in the numbers of staff on the establishment of the institute, and it will pay for the services of the institute's staff who treat patients in the wards of the hospital.

Selective Localisation with Radioactive Isotopes

Radioactive isotopes show a tendency to settle in specific areas of the body, and may thus provide a new method of attacking neoplasms and other localised diseases, according to Dr. John L. Lawrence, of the University of California. "Radioactive carbon-monoxide, compounded with the short-lived isotope carbon 11, was gobbled up by the liver and held there for a while, before being released. We know that radioactive iodine 131 tends to settle in the thyroid gland. With larger than tracer doses it was possible in rabbits to remove their thyroid glands by slow selective radiation which destroyed the glands without damage to other tissues. Other isotopes concentrate in the bone-marrow, still others in the spleen. If we find such a compound for each vital organ, we can introduce it into the body and hit the abnormal area without damage to other organs. Ultimately," says Dr. Lawrence, "we might find a radioactive compound for each particular organ and for each particular type of cancer."

British Council for the Welfare of Spastics

A meeting was held at the London School of Hygiene on Dec. 12, with Prof. J. M. Mackintosh in the chair, to set up a council which will integrate all the activities in the United Kingdom directed to the welfare of adults and children suffering from spastic paralysis or allied conditions. The representatives invited included those of the Royal Colleges and various other professional bodies, the Ministries of Education, Health, Labour, and Pensions, the Department of Health for Scotland and the Scottish Education Department, the Ministry of Health and Local Government of Northern Ireland, the Board of Control, the ancillary medical services, the Trades Union Congress, London County Council, educational and welfare societies, St. Margaret's School, Croydon, and Birmingham Day School. The meeting was called to consider the constitution and trust deed recommended by a working party appointed at a previous meeting (*Lancet*, Oct. 26, p. 624), and to elect officers and an executive committee.

Pharmacists and the Act

About 170 million prescriptions a year will be dispensed under the National Health Service by chemists and health centres in England, according to Mrs. Irvine, vice-president of the Pharmaceutical Society of Great Britain, speaking on Nov. 27. Under present conditions, she said, it was unlikely that many health centres would be set up within the next five or ten years. That gave a fine start to the private shop and she hoped that before the Act came into force pharmacies would be equipped and staffed to deal with such an influx of prescriptions.

Mr. F. C. Wilson, of the society's council, has lately argued that if trade-union principles are followed, not less than four pharmacists will eventually be needed at each of the 5000 health centres he expects to see established. Since pharmacists on the register total only 25,000, there may, he thought, be some difficulty in obtaining them. "However the available number of pharmacists is distributed," he added, "there will be over double the number of patients for whom pharmacists will have to undertake dispensing, because . . . the functions of prescribing and dispensing are being permanently separated."

Notes and News

SCIENTIFIC REPORT OF ROYAL COLLEGE OF SURGEONS

During the first post-war year the college has been putting its house in order. The report for 1945–46 records that by last June all the anatomical specimens which had been evacuated to dispersal centres were back at the college; though here and there dampness had taken its toll, most were found to be in good condition. But a review of the specimens which survived bombing of the college has revealed heavy losses which can be repaired only by years of work and heavy expense; and the work cannot start until the department has been repaired and re-equipped. The department of pathology, after discarding some 1500 specimens, is left with 2800 specimens of value.

New light has been shed on body function in undernutrition by research teams working for Shaef in Western Holland and later for the Control Commission in Germany, under Dr. John Beattie, the Bernhard Baron research professor. Heat loss is regulated by nervous control of the skin vessels, while heat production, under conditions of rest, is controlled principally by the endocrines, which in turn may be influenced by nervous mechanisms. In starvation as seen in Western Holland the body temperature becomes stabilised at a low level, but the diurnal variations often exceed those in normal individuals. For the optimum rate of growth the calorie input must be constantly related to the input nitrogen; when the nitrogen input is doubled calorie input also has to be doubled to conserve as much as possible of the nitrogen. The later work in Germany showed that hunger-œdema is not, as was thought, due merely to hypoproteinæmia; it results apparently from a specific defect in the kidney induced by the deficient diet.

MEDICAL PHOTOGRAPHERS

Hospitals wishing to establish photographic departments have probably found difficulty in obtaining suitable technical staffs, owing to the lack of a recognised standard by which to gauge ability and experience. Institutions are understandably disinclined to pay high salaries for uncertain service, while photographers are reluctant to enter a field which offers no guarantee of a reasonable reward. Moreover, the few training centres have hitherto shown little inclination to run courses in medical photography. The decision by the Institute of British Photographers to set aside one part of their final examination to medical photography will thus be welcomed. A fairly comprehensive syllabus has been drawn up, and the first examination will be held in about twelve months. This action should help to place medical photography on a firmer footing.

U.S. ARMY CENTRE FOR THE DEAF

The United States army has established at Washington, D.C., an aural reablement centre for 250 "students" with impaired hearing. The unit, according to the *Journal of the American Medical Association* (1946, **132**, 219), will have its own laboratory, where dental technicians will make the ear-fitting moulds into which the receiver of the hearing aid is installed. The centre will have a staff of about 50, including 12 instructors in speech reading, 6 acoustic technicians expert in testing and fitting hearing aids, 6 technicians who will teach the use of the device, 5 speech correctionists, and smaller numbers of specialists in other fields. Students will remain about eight weeks. Major H. C. Barnaby, the director, has estimated that not more than 20% of deafness in the army is attributable to blast or other enemy action.

GOVERNMENT EMPLOYMENT FOR THE DISABLED

Under the Disabled Persons (Employment) Act, 1944, the Minister of Labour is empowered to provide opportunities for employment under special conditions of those who are unfit for other work. Accordingly, the Minister has formed a non-profit-making company, known as the Disabled Persons Employment Corporation, which has already established four factories—at Bridgend, Salford, Longton (Staffs), and Birmingham—and hopes to have a further four working by next April; altogether 48 factories, each employing 100–300 workers, are planned. Employees will be trained in wood, plastic, leather, and light assembly work, and, if competent, will be paid at the full trade rate. Special provision is to be made for epileptics and for the tuberculous; the factories will also supply materials and tools to workers who are fit only for employment in their own homes.

FILM CATALOGUES

The Scientific Film Association, of 34, Soho Square, W.1, has compiled two new catalogues. The first, a *of Films of General Scientific Interest* (5s.), lists in order over 600 such films available in Great Britain, from over sixty sources. For each film there are full of availability and a brief summary of content, while have in addition a useful appraisal of merit. A subject index at the back shows that over 100 of the films of medical interest. This will be a standard work of for teachers and programme committees. The *Catalogue of Films on Anæsthesia* (3s. 6d.), gives details films in loose-leaf format. For each film is given the catalogue number referring to the work shortly to be by the association in coöperation with the Royal So Medicine, the running-time, gauge, country and ye origin, distributor, and a two-line summary of the and purpose of the film. Next follow data on the used in presenting the material (whether diagram or ac studio-made or on-the-spot), an extended summary o film, in telegraphic style, and—most valuable of all—a critical assessment of the value of the film for purposes, based on the collective opinion of groups of selected by the association from all levels of interest: teacher, houseman, student, and nurse. It is obvious this system involves a great amount of labour, but the justify the trouble.

STETHOSCOPE AMPLIFIER

New Electronic Products Ltd., of 95, Station Hendon, N.W.4, are manufacturing an amplifier for use an ordinary stethoscope. Two alternative ranges, for ca and respiratory sounds respectively, can be emphasised reproduction is fairly faithful, even of breath sounds low a frequency as 25 cycles a second. Physicians presbyacusis might be well advised to equip themselves this instrument, which has the advantage of being co and inconspicuous. The price is about £40.

University of Cambridge

The faculty board of medicine have recommended appointment to the department of radiotherapeutics reader, and of a physicist with special reference to the app tion of electronics to radiotherapy. Mr. D. E. Lea, PH.D. Mr. H. F. Freundlich have been named for the posts.

On Nov. 30 the degrees of M.B., B.CHIR. were conferre M. C. Joseph (by proxy).

University of Dublin

On Dec. 4, at the school of physic, Trinity College following degrees were conferred:

M.D.—M. O'C. Drury, L. L. Griffiths, R. J. S. Wilson.

M.Ch.—H. A. Daniels.

M.B., B.Ch., B.A.O.—J. R. Bannister, D. S. N. Darling, D M. N. M. Dooley, M. E. Eppel, Robert Esler, J. P. R. F E. M. H. Forster, D. S. Kearon, P. J. MacCarthy, Esther M. Mc Eileen Moriarty, D. T. L. Nash, S. J. Poots, Brian Redmond, Robinson, Derek Anton-Stephens.

Licences in Medicine, in Surgery, and in Obstetric Sci Ivor Citron.

Royal College of Surgeons of England

Demonstrations in anatomy, applied physiology, pathology will be given at the college between Jan. March 28, from 10 A.M. to 1 P.M. and from 2 to 3.30 daily.

Course in Dairy Technology

A course of twelve lectures on Recent Advances in Technology is to be held at the Central Laboratories Express Dairy Co. Ltd., 133, Euston Road, N.W.1, at 6.3 on Tuesdays between Jan. 14 and April 1. Application be made to the Principal, Chelsea Polytechnic, M Road, S.W.3.

Francis Amory Septennial Prize

The American Academy of Arts and Sciences is of in 1947 this prize for outstanding work on diseases aff human reproductive organs published during the last years. No formal applications and no essays or tre should be submitted but the committee will welcome su tions from any appropriate source that will help the making a wise selection. Recommendations may be add to the secretary, Amory Fund Committee, American Ac of Arts and Sciences, 28, Newbury Street, Boston, M chusetts.

PNEUMOCONIOSIS IN SOUTH WALES ANTHRACITE MINERS

C. G. Gooding
M.D. Edin.
MEDICAL OFFICER, AMALGAMATED ANTHRACITE COLLIERIES LTD., AMMANFORD

This paper is based partly on clinical experience rovided by examination of many hundreds of anthracite niners during the last twenty years, and partly on the ecropsy findings in 592 deaths among certified silicotics*: 30 cases in which I was present at the necropsy, and 62 cases in which the necropsy findings were obtained rom medical colleagues, in particular Dr. T. W. David, hief medical officer, Amalgamated Anthracite Collieries td., or from the official certificates of the Silicosis Medical Board. The records of the company were also vailable for analysis.

CLINICAL FEATURES

In slighter grades there are very often no symptoms, and even in the advanced stage sometimes few or no symptoms.

The main symptom is *dyspnœa*, increasing with advancing damage to lung tissue and often augmented in older men by cardiorenal disease. In advanced stages dyspnœa may be present even at rest; but the disease develops gradually, and some men work right up to the end.

Cough is variable. In uncomplicated cases it is often absent or unproductive. Associated conditions, such as bronchitis and tuberculosis, may alter its features. *Sputum* may be absent or slight, even in some infected cases. Black spit, if persistent or recurring after an interval, indicates that the lung lesions are breaking down. *Pain* is not a significant feature, but there is often a history of past attacks of pleurisy. *Fever*, rapid pulse, wasting, and other toxic features develop only with added infection and not always then.

Physical signs are often slight, even with advanced lesions. Prolonged expiration, impaired percussion note, and reduced expansion are the commonest findings. As the disease advances, the air inspired may be so diminished that the respiratory murmur may be inaudible, especially in the presence of thickened pleura. Definite bronchial breathing suggests tuberculosis. Cavities, even when large, may not be clinically detectable. Adventitious sounds, dry and moist, may be present. Böhme (1939) emphasised as a diagnostic mark of severe silicosis the disproportion between the severity of the whole clinical picture and the slight signs found on percussion and auscultation in men with a history of adequate exposure to dust.

NECROPSY FINDINGS

The lungs are usually adherent to the thoracic wall, sometimes rendering their removal a strenuous operation. This adherence particularly affects the upper parts of the lungs, but basal adhesions too are common. Adhesions may be widespread or take the form of tough stringy bands. Often the pleuræ are much thickened. The surface of the lung may be smooth, but in advanced cases is more often distorted by puckering, most often in the mid or upper zones. Gross emphysema often gives the impression that the lungs are made up of many lobes, somewhat like a bundle of balloons.

The cut surface shows areas of fibrosis, black or blackish and varying in size from small discrete nodules, through patches of various sizes, up to very large areas of consolidation. In men who have worked consistently in hard headings—i.e., been much exposed to dust with a high content of free silica—it may present discrete nodules, as in "classical" silicosis, with little or no blackening; but such nodulation is often scanty and sometimes not apparent in the lungs of workers at the coal face, the massive type of fibrosis prevailing in colliers. Nodules in rock workers tend to be harder and more sharply defined than in colliers. The massive consolidations may be very large, of lobar dimensions or greater. In one case the normal lung tissue was so extensively replaced by massive fibrosis that I was almost forced to conclude that the patient had developed some extrapulmonary mode of respiration. These consolidated masses cut with a dry surface like solid black rubber. (One doctor jestingly says he uses this rubbery consistence as a test—"if the lung bounces, it is silicotic.") They may be solid and intact but often crumble and disintegrate and are often extensively excavated and filled with liquid or semi-liquid inky material. This material, if it escapes to the air tubes, provides the black spit of silicotic coalminers. Sometimes a whole upper lobe which appears from the surface to be solid is found on incision to be a thick-walled bag of this inky material. Lymph-glands about the lung root are usually enlarged, black, and fibrotic.

ASSOCIATED CONDITIONS

Tuberculosis.—Liability of "classical" silicotics to develop pulmonary tuberculosis is notorious; and, when the "classical" silicotic dies of his disease, tuberculosis is a usual accompaniment. Certain groups of colliery workers who worked consistently in hard headings (tunnelling through rock) provide a parallel to this, but there is less agreement about the incidence of associated tuberculosis in the pneumoconiosis of ordinary coalminers. There are in these cases even more obscuration and modification of the tuberculous element than in the classical silicosis of South Africa, and it is often difficult to recognise tuberculosis in these cases, even in microscopical sections.

Sometimes tuberculosis was evident in lung tissue adjacent to the fibrotic patches, where it had seemingly escaped the trammels of the pneumoconiotic lesion and flared into a tuberculous bronchopneumonia. Sometimes there was a cluster of tubercles adjoining a fibrotic lesion; very rarely a more general miliary distribution; sometimes a more chronic fibrocaseous lesion. In other cases tuberculosis was recognised by greyish mottling of some part of the fibrotic area or by a glandular lesion. Occasionally a case showing features suggesting, perhaps only faintly, tuberculosis in the lung was unmasked by meningeal or abdominal tuberculosis. In some patients whose sputa had been positive it was very difficult to recognise tuberculosis at necropsy.

Belt and Ferris (1942) remark that in a group of cases of identical appearance the tubercle bacillus would be found in one and not in another, but they were inclined to regard all the massive disintegrating lesions as phthisical, and suggested the name coniophthisis for the special type of lesion arising from the dust plus tubercle effect, "characterised," as they say, "by a reaction more fibrous, less cellular, more chronic-looking, and more widespread, obscured by a heavy dust deposit present sometimes even in the caseous parts of the lesion, with cavities more heavily encased in solid tissue and less voluminous than those of ordinary phthisis, and with few tubercle bacilli." It is not surprising that tuberculosis so lacking, as in these cases, in its usual clinical features should be correspondingly difficult to detect at autopsy, and in his series of 42 Belt detected the tubercle bacillus in only 8, and in 13 others with lesions of identical appearance he failed to detect the bacillus.

In my series of 230 necropsies tuberculosis was recognised in 59, just over a quarter, but disintegration and cavitation of the fibrotic lesions were noted in many

---

* Most of the patients who died had been certified under the pre-1943 schemes as "suffering from silicosis."

Exhibition of Ethiopian Art

An exhibition of Ethiopian art and industry is to be held at Foyle's bookshop, Charing Cross Road, W.C.2, from Jan. 20 to Feb. 4. Those willing to lend exhibits are asked to communicate with Miss Sylvia Pankhurst, hon. secretary of the Princess Tsahai Memorial Hospital Council, 3, Charteris Road, Woodford Green, Essex.

Allied Awards to British Officers

The President of the United States has conferred awards on the following medical officers in recognition of distinguished services in the cause of the Allies.

Legion of Merit.—Surgeon Rear-Admiral Sir GORDON GORDON-TAYLOR, K.B.E., C.B., Brigadier H. L. GLYN HUGHES, O.B.E., D.S.O., M.C. (degree of commander); Colonel F. S. GILLESPIE, Lieut.-Colonel A. N. B. ODBERT, O.B.E. (officer); Surgeon Lieut.-Commander A. P. CURTIN, Colonel THOMAS YOUNG, O.B.E. (legionnaire).

Medals.—Lieutenant J. D. DEVITT (silver star); Wing-Commander EDNA BUTLER-JONES, Brigadier M. L. FORMBY, Captain T. W. RENTON, Lieutenant J. G. SEARLE (bronze star).

Typhus Commission Medal.—Brigadier R. W. GALLOWAY, C.B., D.S.O., Brigadier G. S. PARKINSON, Colonel H. D. CHALKE, O.B.E.

The Prince Regent of Belgium has appointed Major-General Sir Edward Phillips, K.B.E., D.S.O., M.C., a commander of the Order of the Crown.

The Queen of the Netherlands has appointed Major G. F. Bramley and Major Harold Kennedy, M.B.E., knight officers of the Order of Orange Nassau with swords.

Appointments

BROWN, ARNOLD, M.B. Manc., D.P.H.: M.O.H., Cheshire.

CAHILL, JOHN, B.SC. N.U.I., M.R.C.S.: senior assistant M.O., Middlesbrough school health service.

EDINGTON G. M., M.B. Glasg.: M.O., Gold Coast.

ELDER, C. L., M.B. Glasg., D.P.H.: M.O.H., St. Albans.

GILLAM, G. G., M.D. Lond., M.R.C.P.: senior physician, Selly Oak Hospital, Birmingham.

HARTLEY, L. B., M.B. Camb.: ophthalmic surgeon, Woking Victoria Hospital.

LEIGH, A. G., M.D. Lpool, F.R.C.S.: surgeon to ophthalmic department, National Temperance Hospital, Hampstead.

ORMISTON, GEORGE, M.D. Edin., M.R.C.P.E.: pædiatrician, Southampton Children's Hospital and Royal Hampshire County Hospital.

PARTINGTON, C. N., M.B. Lpool: assistant bacteriologist and pathologist, Staffs.

PLUMMER, N. S., M.D. Lond., F.R.C.P.: physician, Edenbridge and District War Memorial Hospital, Kent.

PUGH, D. L., M.R.C.S.: assistant T.O., Kent.

RINKEL, L. R. J., M.R.C.S.: medical superintendent, British Legion Sanatorium, Nayland, Suffolk.

RONALD, JAMES, M.D. Edin., F.R.C.P.E.: assistant physician, Stirling Royal Infirmary.

ROSS, C. M., M.B. Edin., D.PSYCH.: deputy medical superintendent, Gateshead Mental Hospital, Northumberland.

SMITH, G. G., M.R.C.S.: M.O., British Honduras.

SPALDING, J. E., M.S. Lond., F.R.C.S.: surgeon i/c Wrexham Emergency Hospital, Denbighshire.

STRATTON, G. B., M.R.C.P.: temporary assistant M.O.H., Wimbledon.

Chesterfield and North Derbyshire Royal Hospital:

GRAHAM, J. M., M.B. Sheff.: visiting anæsthetist.
HERBERT, G., M.B. Camb., F.R.C.S.: assistant visiting surgeon.
MUIRHEAD, H. C., M.R.C.S.: assistant ophthalmic surgeon.
NICOLL, E. A., M.D. Camb., F.R.C.S.E.: surgical director of accident service.
POOLER, H. E., M.B. St. And., D.A.: visiting anæsthetist.
TAYLOR, V. J. M., M.B., M.CH.(ORTH.) Lpool, F.R.C.S.E.: orthopædic surgeon.

Dudley Road Hospital, Birmingham:

DISNEY, M. E., M.D. Lond., M.R.C.P.: senior physician.
FERRIMAN, D. G., D.M. Oxfd, M.R.C.P.: senior physician.
HEARN, G. W., M.D. Lond., M.R.C.P.: senior physician.
MAY, K. S., M.D. Lond., M.R.C.P., D.L.O.: senior physician.

Hospital for Sick Children, Great Ormond Street, London:

BODIAN, MARTIN, M.D. Vienna, L.R.F.P.S., D.C.P.: morbid anatomist.
HULBERT, K. F., M.B. Lond., F.R.C.S., D.A.: orthopædic registrar.
MACNAB, G. H., M.B. Edin., F.R.C.S.: surgeon.
MATTHEWS, D. N., O.B.E., M.D., M.CHIR. Camb., F.R.C.S.: plastic surgeon.
NASH, D. F. E., F.R.C.S.: surgical registrar.
NEWNS, G. H., M.D. Lond., M.R.C.P.: physician to outpatients.
SHARP, H. S., M.B. Camb., F.R.C.S.: surgeon to ear, nose, and throat department.
WALLACE, E. N. K., M.B. Lond: outpatients aural registrar.

St. Mary's Hospital for Women and Children, Plaistow:

BLACKBURN, F. H., M.B. Durh., D.A.: anæsthetist.
BLUNN, D. R., M.R.C.S., D.A.: anæsthetist
JOAD, M. M. G., M.R.C.S., D.A.: anæsthetist.

Examining Factory Surgeons:

DELAP, P., M.B Dubl.: Appleby, Westmorland.
HUGHES, W., M.R.C.S.: Ashton-in-Makerfield, Lancs.
REID, A. C., M.B., B.SC. Edin.: Almondsbury, Glos.
ROBERTS, W. H., M.R.C.S.: Buckfastleigh, Devon.

Ministry of Health:

Medical Officer

MACFARLANE, JAMES, M.B., B.COMM. Edin., D.P.H., M.O., Department of Health for Scotland, seconded to the Ministry of Health.

Diary of the Week

DEC. 15 TO 21

Monday, 16th

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Sir James Chadwick, F.R.S.: Atomic Energy a Applications to Medicine. (Lloyd Roberts lecture

HUNTERIAN SOCIETY
7.15 P.M. (Pimm's, 3, Poultry, E.C.2.) Dr. Geoffrey Flatulence.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. A. D. Porter: Vitamin A in Dermatology.

Tuesday, 17th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. R. W. Raven: Melanoma and Related (Erasmus Wilson demonstration.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Pathology.* Thrombosis: Mr. H. J. B. Atkins aspects); Dr. R. H. B. Short (pathology of primary bosis): Dr. Helen P. Wright (platelet changes) H. P. Gilding (anticoagulants).

EUGENICS SOCIETY
5.30 P.M. (Royal Society, Burlington House, Piccadilly, Dr. J. W. B. Douglas: Social and Economic Childbearing in Britain: Report of a Q Inquiry.

LONDON SCHOOL OF DERMATOLOGY
5 P.M. Dr. H. Corsi: Diseases of the Nails.

Wednesday, 18th

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Place, W.1
3.30 P.M. Dr. C. H. C. Toussaint: Tuberculosis—the O and its Approach.

Thursday, 19th

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. E. Ashworth Underwood: Naval Medicine in th of Elizabeth and John. (Thomas Vicary lecture.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Dermatology.* Cases will be shown at 4 P.M. Dr Hohmann (Groningen): Erythematous Initial Tuber

---

Births, Marriages, and Deaths

BIRTHS

BALY.—On Nov. 30, at Hillingdon, Middlesex, the wife of Dr Baly—a son.

BLACK.—On Nov. 30, in Leeds, the wife of Mr. George Black, F.R —a daughter.

COOMBS.—On Dec. 2, the wife of Dr. Gordon Coombs, of Ho Norfolk—a daughter.

CORBIN.—On Dec. 4, the wife of Mr. John O. Corbin, F.R.C. Cudham, Kent—a daughter.

DE SOLDENHOFF.—On Dec. 2, in Ayrshire, the wife of Mr R de Soldenhoff, F.R.C.S.E.—a son.

HARRIS.—On Nov. 22, at Langport, Somerset, the wife of Dr. Harris—a daughter.

HORNE.—On Nov. 26, at Hampstead, the wife of Dr. N. C. —a son.

LLOYD.—On Nov. 30, at Tenterden, the wife of Dr. T. W. Ll a son.

MACKEITH.—On Dec. 2, the wife of Dr. R. C. MacKeith—a

PUGH.—On Dec. 6, the wife of Dr. David W. Pugh, D.S.C.—a d

TUCKWELL.—On Dec. 3, at Compton, Guildford, the wife o Edward Tuckwell, F.R.C.S.—a son.

TWEEDIE.—On Nov. 15, at Batu Gajah, Malaya, the wife of Reid Tweedie—a son.

VENABLES.—On Dec. 6, in London, the wife of Dr. Peter Vena a son.

WALSH.—On Nov. 25, in London, the wife of Dr. J. J. W a son.

WARD-MCQUAID.—On Dec 2, in Amman, Transjordan, the w Major Neil Ward-McQuaid, R.A.M.C.—a daughter.

WILLIAMS.—On Dec. 9, at Hampstead, Dr. Joy Williams Jowson), the wife of Dr. Denis Williams—a daughter.

MARRIAGES

CLARKE—*HEPBURN.*—On Dec. 5, at Worplesdon, Edward Clarke, M.C., B.M., to Patricia Hepburn.

NEVIN—DENNIS.—On Nov. 20, in London, Henry Millar Nevin, to Josephine Irene Dennis.

DEATHS

BAYLIS.—On Dec. 6, at Horns Cross, N. Devon, Henry Ed Montgomery Baylis M.B. Durh.

BROWNLIE.—On Dec. 4, in Glasgow, John Douglas Bro M.B. Glasg., F.R.F.P.S.G., L.D.S.

GRAHAM-JONES.—On Dec. 6, at Dorchester, John Lawrence Gra Jones, M.B. Camb.

HEWITT.—On Nov. 24, at Redhill, Harry Edward Hewitt, O M.D. Lond., D.P.H., aged 73

PRYCE.—On Dec. 6, at Welshpool, Harold Vaughan P M.B. Camb., F.R.C.S.

SMITH.—On Dec. 3, at Reading, George MacIver Campbell S C.M.G., M.B. Aberd., M.R.C.P., lieut.-colonel I.M.S.

IN recognition of his services to merchant seamen. Percival Cole has been made an honorary life member of Seamen's Union. Mr. Cole has been associated with Dreadnought Hospital for 35 years, and he was for man surgeon to the Tilbury Hospital and Queen Mary's Ho for East London. He is at p Hospital.

TABLE I—MODES OF DEATH IN 227 CASES

Category of certificate	Mode of death			
	Tuberculosis	Non-tuberculous respiratory affection	Cardiac failure	Unrelated causes
ilicosis plus tuberculosis	14	..	2	..
ilicosis—partial disablement ..	4*	4	9†	19
ilicosis—total disablement ..	36	34	64	24
ertified at death only	5	3	9	..
Total.. ..	59 (26%)	41 (18%)	84 (37%)	43 (19%)

* Excluding 2 cases later certified totally disabled.
† Excluding 3 cases later certified totally disabled.

here it has been attributed to radioactivity or to rsenic.

In this series of 230 cases there was only 1 case of lung umour; this was in a man aged 68 and was secondary to an abdominal new growth. Other sites of neoplasm were brain (1), pharynx (1), stomach (4), bowel (3), the men ranging in age from 49 to 68 years. Further, in other cases making with this series a total of almost 400 necropsies, I have noted the following 3 instances of primary lung cancer:

(1) A man, aged 58, with minimal dust changes and refused a certificate by the Silicosis Medical Board.
(2) A man, aged 55, with fairly advanced silicosis
(3) A man, aged 42, with no fibrosis of lungs (accidental death).

There was, therefore, only 1 case of primary lung cancer associated with pneumoconiosis of coalminers. In view of the fact that nearly all silicotic miners who come to necropsy have reached the cancer age, this low incidence suggests that there is no linkage of cause and effect between coalminers' pneumoconiosis and primary lung cancer. Any increased susceptibility of the silicotic to lung cancer has been attributed to silica, and perhaps a higher incidence might be found in workers exposed to high concentrations of the dust of free silica, but the Miners' Phthisis Medical Bureau of South Africa (1944) have reported that lung cancer does not appear to be more prevalent among silicotic than among non-silicotic miners or even men working above ground. Vorwald and Karr (1938) found no increased incidence of pulmonary carcinoma in persons exposed to industrial dusts as compared with the general population.

MODES OF DEATH

In their report on chronic pulmonary disease in South Wales coalminers, Hart and Aslett (1942) give the result of a canvass of general practitioners in the anthracite area in the statement that "cardiac failure and non-tuberculous respiratory affections are common clinical causes of death, while clinical tuberculosis sometimes occupies this rôle." These authors emphasise the comparative infrequency of clinically recognisable tuberculosis, the frequency of cardiac failure, and the opinion of local doctors that severe wasting is common terminally. In connexion with these statements the following analysis of 230 deaths is of interest (cases are arranged in four groups according to the category of certification):

"Silicosis accompanied by tuberculosis"	16
"Silicosis—totally disabled"	161
"Silicosis—partially disabled"	41
Certified at death only	17
Total	235

The excess of certificates over deaths is due to 5 "partial" cases having been subsequently certified "totally disabled."

Silicosis Plus Tuberculosis.—There were 16 cases: 14 confirmed post mortem, and 2 not confirmed and dying of congestive heart-failure.

Silicosis.—"Total" and "partial" cases, and those certified at death only, revealed no significant difference in their modes of death, except that among "partial" cases a greater proportion died from causes unrelated to silicosis.

Of 41 "partial" cases 5 later graduated to the "total" grade, and 19 of the remaining 36 died of unrelated conditions.

Of 161 "total" cases 24 died of unrelated causes, and 3 were an odd assortment: 1 dying shortly after developing pneumothorax, 1 after operation for insertion of radon needles in a pharyngeal new growth, and 1 dying suddenly with gross aortic valvular and myocardial disease, the Silicosis Board regarding silicosis as a contributory factor.

Omitting the 3 odd cases, the incidence of the various modes of death was as follows:

59 (26%) had associated tuberculosis.
41 (18%) had non-tuberculous respiratory affections.
84 (37%) terminated in cardiac failure.
43 (19%) died of unrelated conditions.

These figures are given in table I. All cases are included under the heading of tuberculosis wherever this condition was recognised, even though some of the tuberculous patients appeared to die from congestive cardiac failure rather than from the toxic effects of tuberculosis.

AGE AT CERTIFICATION AND SURVIVAL PERIODS

For consideration of these points my personal series of 230 deaths has been supplemented by 362 others, making a total of 592 cases for analysis. Of these, 66 were certified at death only. Table II deals with the remaining 526 cases, giving category of certificate, average age at date of certification, and average period of survival.

For "partial" cases both the average age at certification and the average period of survival in table II are anomalous. The average age at certification is too high, being raised by a considerable proportion of old men certified partially disabled by silicosis, often with total disablement from other causes, who had various diseases incident to advancing age. As the silicosis in these men was often of minor, sometimes of minimal, degree, and their fatal conditions were usually chronic, these older men probably sought certification because diseases of natural origin had brought their working life to a close. In the 41 cases of my personal series the respective ages at certification and survival periods for the two groups, "silicotic deaths" and "non-silicotic deaths," were 51 and $4^{1}/_{2}$ years, and $55^{2}/_{12}$ and $2^{4}/_{12}$ years.

TABLE II—AGE AT CERTIFICATION AND SURVIVAL PERIODS OF 526 SILICOTICS IN DIFFERENT CATEGORIES

Category of certificate	No. of deaths	Average age at certification (years)	Average survival period (years)
Silicosis (or pneumoconiosis)—totally disabled	370 (*70·3%*)	53	$4^{8}/_{12}$
Silicosis (or pneumoconiosis)—partially disabled ..	103 (*19·6%*)	54	$3^{10}/_{12}$
Silicosis (or pneumoconiosis) plus tuberculosis ..	53 (*10·1%*)	$45^{7}/_{12}$	$1^{10}/_{12}$

The true average age at certification for "partial" cases is 46 years, as shown in the last column of table IV, based on all certified cases of a large group of collieries and giving the age-distribution of all cases according to the category of the certificate: "totally disabled," "partially disabled," and "certified at death only."

The survival period is also anomalous, being unduly lowered by the older men mentioned above, and gives a false value for the expectation of "partial" cases, because it refers only to cases other than those recognised as tuberculous. Many pathologists do not regard this crumbling and cavitation as necessarily due to tuberculosis (Cummins and Sladden 1930, Cooke 1932, Gough 1940), but Belt and Ferris are not inclined to regard them as formed by disintegration of fibrous tissue, and think they are more probably necrotic from the first. Extensive lesions may show little or no disintegration or liquefaction, and relatively small lesions may show softening and breakdown without obvious tuberculosis. To a great extent opinion will depend on the criteria of diagnosis. If demonstration of the tubercle bacillus is insisted on, the tuberculous nature of these lesions in many instances cannot be proved, for very prolonged and thorough search of many sections may be necessary for its discovery. The comparable difficulty of detecting the bacillus in sputum may be noted. There is, however, an increasing tendency to regard infection as a factor in the production of these massive lesions. In this connexion it must be remembered that infection which was originally an important element in the disease may have retrogressed, and sometimes at necropsy an old apparently healed tuberculous focus is found with a black fibrotic shell surrounding it, without any silicosis of general distribution.

Wasting and other toxic features of tuberculosis were not constant, even when tuberculosis was obvious post mortem. Wasting is often difficult to estimate, but family doctors were usually present to give information on the point. It was exceptional in earlier stages of the disease, unless there was some associated wasting disease. Apart from this, only 1 case of 36 certified "partially disabled" exhibited wasting. It was more common among men with advanced silicosis. Of 161 cases certified "totally disabled by silicosis" wasting was present in 61. Of these, 25 had tuberculosis and 8 malignant disease; 14 had non-tuberculous respiratory affections, and these, together with the remaining 14, all had massive confluent lesions with much necrosis and disintegration of the masses but no recognisable tuberculosis.

Of the 230 cases 59 were ranked as tuberculous on necropsy, and 39 of these showed appreciable wasting.

Uncomplicated silicosis, therefore, even with massive lesions, does not in most cases cause gross wasting, and even of the tuberculous cases found post mortem a third did not show wasting.

Amor (1941) has suggested that the massive lesions are always accompanied by toxic symptoms. This is not borne out by my observations, many cases with massive crumbling lesions showing no toxic features even when there was a recognisable tuberculous element present; but all cases showing wasting and other toxic features had such lesions, apart from those with other wasting disease, such as carcinoma.

A noteworthy feature of the massive lesions was that they were in a considerable proportion of cases of lopsided distribution, being much more advanced in one lung than in the other. Of 230 cases 43 showed gross asymmetry; 30 had recognisable tuberculosis; 3 others were of special interest. One had a smooth-lined (? healed tuberculous) cavity with a surrounding shell of black rubbery fibrosis and no naked-eye fibrosis elsewhere in either lung. Another exhibited a similar condition, but with more marked fibrosis in, and a calcified gland at the root of, the right lung, and on the left side scanty nodular lesions with one larger lesion about 3/4 in. in diameter. The third, with an old healed empyema on one side, had an almost wholly consolidated black lung on that side, with relatively minor lesions in the other. In 10 other cases there were massive necrotic lesions on one side, with much smaller though often confluent lesions on the other. Asymmetry of lesser, but definite, degree was noted in 18 other cases.

Infection, whether past and obsolescent, or present and active, whether tuberculous or non-tuberculous, appears to be the most likely factor responsible for the lopsi distribution of the fibrotic masses.

Silica is an adjuvant to tuberculosis, coal dust credited with an inhibitory effect (Cummins and Weatherall 1933), and the interplay of these two effects is probably responsible for much of the modification of tuberculosis in silicotic coalminers.

Emphysema.—Minor degrees of emphysema are readily detected at necropsy in the blackened lungs coalminers, but dilation of air spaces was often perc tible, and gross bullous emphysema was common, bei noted in 104 of 230 cases. These were men with sev disablement and massive lesions, except some of old men certified partially disabled by silicosis a usually dying of extrapulmonary diseases.

Pneumothorax due to rupture of an emphysemato bulla may occur, and one man died shortly after develo ing a total pneumothorax on the side of his bet lung. It is possible that this happens more commor than we know but is often partial owing to adhesio I recall one man who had three attacks of pneumothora which, owing to limitation by pleural adhesions, present a puzzling clinical picture.

Non-tuberculous Respiratory Affections.—These we found in about a fifth of the cases. The condition mo commonly found was bronchopneumonia. Lobar pne monia was uncommon, being present in only 2 case Gardner has remarked on this fact. If pneum coniosis involves extensive portions of the lungs it w impair the chance of recovery from any pneumonia reducing the available reserve of functioning lung tissu but apparently it does not render the patient particular liable to lobar pneumonia.

Cardiac Changes.—Opinion is divided about the effe of pneumoconiosis on the heart, and South Africa observers (Irvine, Simson, and Strachan 1930) rema that congestive cardiac failure as a mode of death less common in the recent South African cases than ha been reported in the old miners who had been expose to very heavy dust concentration.

In the present series of 230 cases heart-failure wa the most frequent mode of death. Two types of failur were noted in about equal proportions: (1) congesti cardiac failure, with dropsical limbs, ascites, &c., an (2) terminal failure of circulation, with pulmonar œdema and congestion. These men rapidly develope increasing dyspnœa and tachycardia, dying not suddenl but in a few days.

In 84 cases terminating in one of these ways hypertroph and dilation of the right heart, with chronic venous con gestion of the liver and other viscera, were practically constan In only 4 cases were massive confluent lesions lacking, an these exhibited other cardiac abnormalities.

Of 41 cases of non-tuberculous respiratory affections 2 exhibited right-heart changes and chronic venous congestio of the liver and other viscera All of these had massiv confluent fibrosis.

Of 59 cases recognised as tuberculous at necropsy 29 showe right-heart changes. These all had massive lesions in th lungs, and 10 of the 29 presented a full picture of congesti cardiac failure, which appeared to be the mode of death.

These findings indicate that cardiac embarrassment i a common sequel or concomitant of coalminers' pneumo coniosis, especially in men with massive lesions. This i only what one might expect in view of the extensiv destruction of the pulmonary capillary bed, furthe augmented, as it usually is, by emphysema. Simila cardiac effects in miners in the Ruhr are referred to by Böhme (1939), di Biasi (1939), and Schulte and Husten (1936), and in America by Coggin et al. (1938)

Carcinoma of the Lung.—Recently the question has been raised whether there is in silicotics an increased susceptibility to lung cancer. This question has cropped up before in connexion with the increased incidence of lung cancer in *Joachimstal* and Schneeberg miners, but such a highly nocuous material and it will probably cease to be a menace to health long before we reach anything like total suppression. I believe that the sheer bulk of the inspired dust is important, and that, once dust suppression reaches a stage at which a balance between intake and elimination is approached, much of the dust disease will disappear, as the self-cleansing mechanism of the respiratory system will not then be overwhelmed.

I do not consider that aluminium, introduced experimentally in Ontario, is likely to be of any use as a protective agent against the mixed dust encountered by coalminers.

Another preventive step which will probably be taken before long is the medical examination of workmen before employment and periodically afterwards. This I consider important because I believe that in many cases the seed is sown, or the soil for the silicotic crop prepared, before the boy reaches the mine. Here I enter a strong plea for the exclusion of the man with tuberculosis from the mine. It is probable that the presence of a man with open tuberculosis in the heading is part of the explanation of the deaths of whole teams of "hard headers" such as have been reported in the past. Yet no person or authority has the power to keep the miner with tuberculosis out of the pit.

TABLE V.—AGE-DISTRIBUTION AND NECROPSY FINDINGS IN 592 DEATHS AMONG CERTIFIED SILICOTICS

Cause of death	Age at date of certification (years)				Total
	Under 40	40–49	50–59	60 +	
Silicosis (or pneumoconiosis) plus tuberculosis	29 (*20·0%*)	48 (*33·1%*)	42 (*28·9%*)	26 (*17·9%*)	145
Other silicotic deaths	23 (*6·1%*)	95 (*25·6%*)	169 (*45·5%*)	84 (*22·6%*)	371
Non-silicotic deaths	2 (*2·6%*)	11 (*14·4%*)	29 (*38·1%*)	34 (*44·7%*)	76

TREATMENT

There are no special therapeutic resources at present available, apart from treatment of complicating infections. It is hoped that the unit at Cardiff for research into the possibilities of treatment and rehabilitation of pneumoconiotic miners in charge of Dr C. M. Fletcher may evolve something useful. It may be possible to get men back to a useful condition by some form of training.

SOCIAL ASPECTS

These are most important considerations. The amendment of legislation in 1943 has led to the suspension of many mine-workers at a comparatively early age. This has created a grave man-power problem. The answer is to rid the mines of dust, but the transition problem remains, for the disease is of slow development.

There is also the social problem of providing for the men suspended. A large proportion of these, especially men suspended in the last two or three years, have little, and sometimes no, disability. Many, even advanced silicotics, have helped to man war factories. Most of the suspended men can do ordinary factory jobs. Provision is being made for them by the introduction of new industries to the coalfields. For the men with more severe disablement it may be possible to provide some more "sheltered" occupation, but it is hoped their numbers will be fewer before very long.

SOME UNSOLVED PROBLEMS

We do not yet know why there is a higher incidence in anthracite than in steam and bituminous mines, though King (1945) has hinted that steam and bituminous coals, perhaps by reason of a more intimate mixture with their contained mineral matter, may prevent their contained silica from acting on the tissues with which it comes into contact.

Another unanswered question is that of varying individual liability to dust disease. That men vary in their susceptibility to the effects of dust is certain. I shall cite only two instances.

One man worked for thirty-five years in hard headings: all his working life he spent in them. Five years before his death he was a robust man with a chest expansion of 5 in. Less than a year before his death he began to fail, and within a few months of ceasing work he died with a classical silicosis, like that of the stone-mason, and a galloping tuberculosis.

Another man died at the age of 65 after fifty-one years of underground work: about four years in hard headings and the rest at the coal-face. He worked in a mine with a very high incidence of the disease, but at death his lungs were little different from those of the ordinary town-dweller.

At the other extreme, men have developed dust disease after only a few years in the mine, but in these tuberculosis has been a prominent factor. There must be personal factors at work to explain this variation in susceptibility to dust disease. Doubtless infection is one factor.

Many facets of the problem of coalminers' pneumoconiosis have been passed over. No explanation for them can be offered at present, and the whole problem is so tangled that a full solution will require many years of work in many fields. We are dealing with a mixed dust of which one ingredient, silica, especially in the form of quartz, is an adjuvant, though not always a whole-hearted one, to tuberculosis; another, coal, is credited with an inhibitory effect on tuberculosis and, either alone or in combination with other ingredients, an antidotal effect on the silica. The addition to these mineral factors of the living variables, the man, the tubercle bacillus, and perhaps other organisms, produces a very complicated polygon of forces, and it is not surprising that the disease presents such an intricate tangle.

SUMMARY

The clinical features and morbid anatomy of pneumoconiosis in anthracite miners are described, and associated conditions are discussed with special reference to tuberculosis.

Associated tuberculosis was present in 24·5% of 592 certified miners who died, and in 28% of 516 silicotic deaths. Tuberculosis accompanying pneumoconiosis in coalminers is often lacking in its usual features, both clinically and post mortem, and it is certain that more detailed investigation would reveal tuberculosis in a much greater proportion of silicotic miners who die of their disease.

Gross emphysema was another common accompaniment of the advanced stage of the disease, and emphysema is responsible for much of the disablement in these men.

The predominant modes of death have been indicated. A considerable proportion of certified men died of intercurrent and unrelated diseases, as would be expected when so many of them are old men. Of the "silicotic deaths" about half were due to cardiac failure and half to infection, tuberculosis being found rather more often than non-tuberculous affections.

Signs of embarrassment of the right heart were often found in the men with more advanced pulmonary lesions, even apart from the patients dying of cardiac failure.

This series of cases offers no evidence that there is any increased incidence of primary lung cancer in pneumoconiotic anthracite miners.

The mortality among men in the different categories of certification has been compared. Men with clinically recognisable tuberculosis have a particularly poor prognosis, but many with advanced disease and most of those certified in the early stage survive for many years.

men who die and not to the far greater number who have survived, and will survive, often to a ripe old age, then to die a "natural" death.

The figure for "total" cases in table IV includes all cases of total disablement, whether certified simply as silicosis or as silicosis plus tuberculosis; but the error introduced by this is not great, as the proportion of men recognised to be tuberculous at certification is small. The average age of certification for all cases of total disablement in this table is 52, as compared with 53 in table II, where the two categories are given separately.

TABLE III—ANALYSIS OF 592 DEATHS AMONG SILICOTICS

—	Tuberculosis	Other silicotic deaths	Non-silicotic deaths
All deaths (592) ..	145 (*24·5%*)	371 (*62·7%*)	76 (*12·8%*)
Silicotic deaths (516)	145 (*28·1%*)	371 (*71·9%*)	..

The average survival period for 370 "total" cases in table II is $4^{3}/_{12}$ years.

The relative mortality among men certified totally and those certified partially disabled is very clearly indicated by comparing tables II and IV. From these it is seen that, whereas "partial" certificates comprise over 76% of those issued during life, deaths among "partial" cases amount to less than 20% of the deaths, and a third of these were due to causes unrelated to silicosis. In contrast to this, certificates of total disablement were less than 24% of those issued during life, whereas deaths among "total" cases (simple or complicated by tuberculosis) amount to over 80% of deaths, and of these only 10% were non-silicotic deaths.

The figure for tuberculous cases in table II refers only to men recognised as such when certified, and underrates the incidence of tuberculosis in silicotic miners. This is shown in table III, where it is seen that tuberculosis accompanied silicosis in 24·5% of all 592 deaths and in 28·1% of 516 "silicotic" deaths.

For men certified as silicosis plus tuberculosis the average age at certification is somewhat lower than for other cases of total disablement: $48^{7}/_{12}$ as against 53 (see table II). The survival period of this group is much lower than for the other groups, both "total" and "partial," averaging only $1^{10}/_{12}$ years for 53 cases. The prognosis for this group is very bad, although some men may carry on for a long time, the longest period in this series being $6^{4}/_{12}$ years.

It is only men recognised as tuberculous at certification for whom the prognosis is so poor. The men not so recognised fare better. One man, certified simple silicosis, whose lungs revealed at autopsy silicosis plus tuberculosis, lived 14 years after certification. For the men in my personal series the survival periods of cases grouped according to the three main necropsy findings were as follows:

Cardiac failure	$4^{9}/_{12}$
Non-tuberculous respiratory affections ..	$3^{7}/_{12}$
Tuberculosis	$3^{10}/_{12}$

If cases recognised as tuberculous when certified are excluded, the last figure becomes $4^{9}/_{12}$.

All the figures so far mentioned afford only a partial guide to prognosis. In an effort to obtain a better guide a follow-up of all men certified in 1935 and 1936 was made.

Of 158 men certified totally disabled by silicosis in an advanced stage 100 were alive at the end of five years; of the 58 deaths, 47 were due to silicosis, 8 to natural causes, and 3 to causes unknown. Of these 158 men 57 survived into the tenth year, 81 having died of silicosis, 10 of natural causes, and 10 of causes unknown. A fairly high proportion even of the old men have survived for long periods, nearly a third (7 out of 24) of the men over 60 at date of certification having survived into the tenth year, among them one old stalwart of 68 who is still alive after ten years.

Of 53 men suspended in the early stage of the disease only 3 were dead by the end of five years: 1 dying of silicosis, 1 of natural causes, and 1 of causes unknown. Of this group 44 survived into the tenth year, the 9 deceased including the 3 men mentioned above and 6 others who died of causes unknown.

A small group of men were certified with "partial disablement by silicosis moderately advanced," and these show an expectation falling between that of the advanced and e groups. Of 16 men in this group 11 survived five years, 8 into the tenth year.

In sharp contrast to the above groups, men recogni as tuberculous at certification present a much sad tale. Of 17 men certified suffering from silicosis p tuberculosis, 9 were dead at the end of a year, 14 w dead at the end of two years, and only 1 survived f years, living just into the fifth year.

Another feature of tuberculosis cases is a tenden to earlier onset of disablement in men with associat tuberculosis, whether recognised in life or at death on This is shown in table V, which gives the age-distributi in decades of 592 fatal cases, the age given being that date of certification or cessation of work, for the th groups, based on necropsy findings, silicosis plus tub culosis, other "silicotic" deaths, and non-silico deaths. Of the tuberculous cases, over a half occur the two younger age periods (30–50) and over a fifth the youngest (30–40).

Of the other "silicotic deaths" less than a thi occupy the two younger periods, and only slightly ov a twentieth occur in the youngest period, the large percentage falling in the sixth decade.

Of the non-silicotic deaths even smaller proportio occupy the two younger periods, and the highest pe centage is in the oldest age period (60+).

PREVENTION

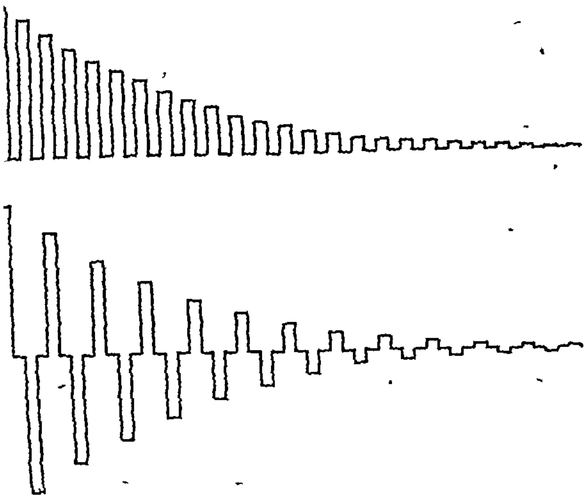
This aspect of the subject can be dealt with on very briefly. In our anthracite mines we have not wait for the solution of the chemical, physical, and biologic aspects of the problem to develop preventive method Our Silicosis Research Committee have studied the loc features of the problem and have attempted to devel practical preventive measures. Briefly, we depend wind and water: water to prevent the liberation of du by infiltrating the coal seam before it is worked, spray dry coal and rock, to water roadways, and permit the use of wet drilling; wind in the form of a ample ventilating current to dilute and remove su fine dust as escapes the water traps. This fine dust, on liberated into the atmosphere, must, we say, be treat as a gas.

The limited problem of dust suppression in hard hea ings is not difficult of solution. Wet drilling, sprayi of broken rock, precautionary measures with shot-firin and an ample ventilating current will achieve success the only insuperable obstacle being the human on notably the man who will not use the protective apparat supplied. We now consider hard headings the safe places in our mines. It is a much more difficult matt to suppress dust at the coal face, and total suppressio cannot be achieved, but we are reducing the amoun The dust inhaled by the average coal-face worker is n

TABLE IV—AGE-DISTRIBUTION AND AVERAGE AGE OF CERTIF CATION OF DIFFERENT CATEGORIES IN 3745 CERTIFICATI (SILICOSIS OR PNEUMOCONIOSIS)

Category of certificate	Age at date of certification (years)				Total	Ave age certi catio (yea
	Under 40	40–49	50–50	60 +		
Totally disabled—silicosis (or pneumoconiosis) or silicosis plus tuberculosis	98 (*11·3%*)	238 (*27·5%*)	338 (*39·1%*)	190 (*22·0%*)	864 (*23·6%*)*	52
Partially disabled—silicosis or pneumoconiosis	842 (*30·1%*)	964 (*34·4%*)	703 (*25·1%*)	290 (*10·4%*)	2799 (*76·4%*)*	46
Certified at death only	5 (*6·1%*)	17 (*20·7%*)	24 (*29·3%*)	36 (*43·9%*)	82	57

* Of 3663 men certified during life.



ig. 3—Wave-form of current passed through patient with the new apparatus: (a) monophasic; (b) diphasic.

echnical difficulties by producing a unit which would nduce a convulsion by condenser discharge.

There are two ways in which a condenser may be discharged: monophasically (unidirectionally) and diphasically (bidirectionally). Several workers have indicated that different results might be expected from these two types of current. The diphasic wave-form produces more intracellular disturbance than does the monophasic. We therefore decided to construct an apparatus capable of delivering monophasic or diphasic current from condenser discharge, *rather than to incorporate this feature in our universal argotron set.*

Before we discuss the theoretical and experimentally tested advantages of steep-wave *decremental discharge* in electroplexy and the apparatus used, it is desirable to give a short account of the MacPhail-Strauss first universal electroplexy unit, if only because, so far as we know, it is the only apparatus of its kind in the world. Moreover, it illustrates the considerable number of electrotechnical problems which have to be satisfactorily solved, before it can be considered safe to produce a piece of electromedical apparatus of this kind, destined to be used, for the most part, by people with little knowledge of physics.

FUNDAMENTAL CIRCUIT OF UNIT

The fundamental circuit of the argotron electroplexy unit is illustrated in fig. 4.

The transformer T1, T2, T3, T4, T5 may be excited through switches 9 and 12 by A.C. or D.C. mains, through the vibrator (6) and switches 8, 9, and 11, or from 12-volt supply from B through the same switches.

T2 supplies a small A.C. voltage through R3 across R4. This permits a known A.C. current (125 microamps) to flow through the shorted jack, when the calibrated resistance is maximal (1000 ohms). The introduction of the patient's impedance causes a drop in the current flowing. By decreasing R5 till the same current-reading at the reference line is shown (125 microamps), the subtractively calibrated scale of R5 will indicate the patient's impedance directly.

T3 and T4 provide a source of direct current through rectifier V1, which charges timing condenser C3. On throwing the switch TS, the charge excites the relay R, which will momentarily close switches S1, S2, S3, and S4. Calibrated control R6 gives exact timing plus or minus $^{1}/_{100}$ sec. from $^{1}/_{10}$ to 1 sec. in steps of $^{1}/_{10}$ sec. R7 is the minimal timing limiter.

The patient's shock transformer, T6, T7, T8, may be excited from A.C. via centre tap of T6 and switch 14. It may be excited from D.C. via 13 and 14 and argotrons A1 and A2. The "flywheel" of the circuit is C1 and choke 15. Grid-control and phasing is from T4 and R1; and R2, C2 provide bias.

The shock transformer may also be excited from a 12-volt battery through vibrator 7 and T7.

T8, the shock winding, is rated at 200 watts and provides shock-voltage from 35 to 145 volts in 5-volt steps. N2 is a neon pilot showing moment of shock. J2 is patient's shock jackhole.

N1 is the neon showing when the set is "*on*."
4 is the battery circuit fuse.
3 is the A.C./D.C. mains fuse.
17 is the patient's circuit fuse.
5 is the battery-supply switch.
2 is the mains-supply switch.
1 is the vibrator dropping resistor for D.C. mains.

ADVANTAGES OF STEEP-WAVE CURRENT

All of the advantages which we anticipated might belong to steep-wave, as opposed to sinusoidal, currents were shown to exist when the method was tried out in practice:

(1) The steep-wave current has a much higher equivalent frequency and a higher potential gradient. From this we deduced *(a)* that we might be able to dispense with the preparation of the skin, because even a very greasy and sebaceous integument could be calculated to offer *but little* resistance to this type of current; and *(b)* that we might be able to reduce the area of electrode surface, so as to deliver the current transfrontally in the form

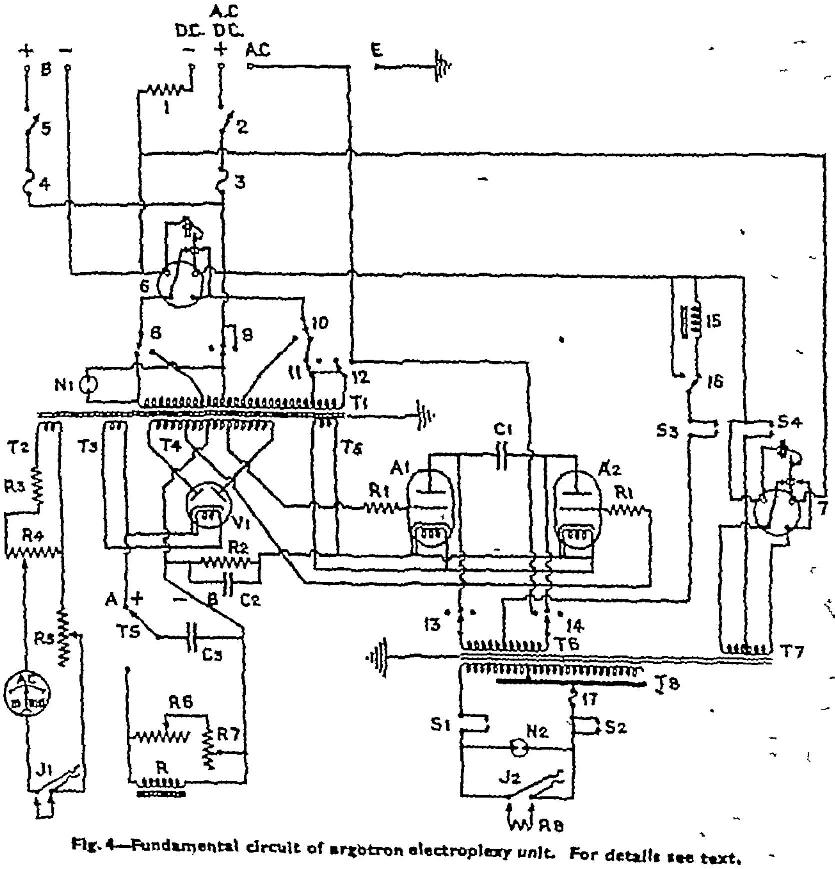


Fig. 4—Fundamental circuit of argotron electroplexy unit. For details see text.

There is a tendency to earlier onset of disablement in men showing evidence of associated tuberculosis in life or at death than in the apparently uncomplicated cases.

Prevention and social and other aspects of pneumoconiosis are briefly referred to.

REFERENCES

Amor, A. J. (1941) An X-Ray Atlas of Silicosis, Bristol.
Belt, T. H., Ferris, A. A. (1942) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 243.
Böhme, A. (1939) *Dtsch. med. Wschr.* 65, 366.
Coggin, C. B., Griggs, D. E., Stilson, W. L. (1938) *Amer. Heart J.* **16**, 411.
Cooke, W. E. (1932) *Practitioner*, **129**, 483.
Cummins, S. L., Sladden, A. F. (1930) *J. Path. Bact.* **33**, 1095.
— Weatherall, O. (1933) *J. Hyg., Camb.* **33**, 295.
di Biasi, W. (1939) *Dtsch. med. Wschr.* **65**, 369.
Gough, J. (1940) *J. Path. Bact.* **51**, 277.
Hart, P. D'A., Aslett, E. A. (1942) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 243.
Irvine, L. G., Simson, F. W., Strachan, A. S. (1930) *Int. Labour Off. Studies and Reports,* series F, no. 13.
King, E. J. (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 250.
Miners' Phthisis Medical Bureau, S. Africa (1944) *Trienn. Rep.* 1938–41, Pretoria.
Schulte, G., Husten, K. (1936) Röntgenatlas der Staublungenerkrankungen der Ruhrbergleute, Leipzig.
Vorwald, A. J., Karr, J. W. (1938) *Amer. J. Path.* **14**, 49.

STEEP-WAVE ELECTROPLEXY

E B STRAUSS
M.A., D.M. Oxfd, F.R.C.P.
PHYSICIAN FOR PSYCHOLOGICAL MEDICINE, ST. BARTHOLOMEW'S HOSPITAL, LONDON; HON. RESEARCH PSYCHIATRIST, MAIDA VALE HOSPITAL FOR NERVOUS DISEASES

ANGUS MACPHAIL
F.I.E., M.S.R., C.S.P.
RESEARCH ELECTROPHYSIOLOGIST, MAIDA VALE HOSPITAL FOR NERVOUS DISEASES

THE object of the steep-wave type of electroplexy or electric convulsion therapy (E.C.T.) is to produce therapeutic convulsions with minimal discomfort to the patient, minimal damage to nervous tissues, minimal disagreeable after-effects, and minimal risk of extraneous accidents.

Though from the purely technical point of view much progress has been made in the design and construction of electroconvulsant apparatus—and we ourselves, year by year, have attempted to improve on our own work—it cannot be claimed that there has been any progress involving *principle* since Bini and Cerletti constructed their first apparatus.

Up to now, all apparatus, good, bad, and indifferent (and there have been some which have been open to serious electrotechnical criticism), have been constructed to deliver an alternating current (A.C.) at a selected voltage over a selected time-interval. In other words, a fit was to be produced by bombarding the cerebral cortex over a relatively wide area with a sequence of A.C. electrical impulses of (theoretically) equal voltage, during the passage of which the transtemporal resistance had been considerably reduced by the first few impulses. The wave-form, on analysis, in all types of A.C.-excited apparatus is approximately sinusoidal.

The noxious effect of this sinusoidal type of current on cortical neurones is still controversial, though the latest work shows that it can be reduced to a negligible factor by proper precautions. Nevertheless, that structural changes do occur, even though they are not necessarily irreversible, is shown by the organic type memory-defect and by the recorded changes in th electroencephalogram which are commonly associate with electroplexy.

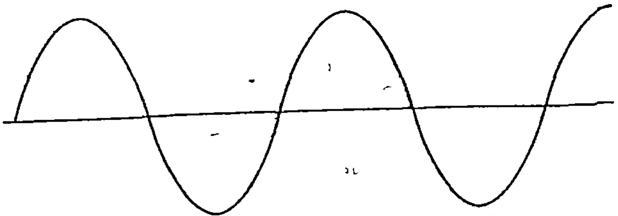


Fig. 1—Wave-form produced by first standard A.C. mains unit.

It therefore occurred to us some five or six years ag that it would be desirable to induce fits electrically wi a type of current (thinking in terms of wave-form) whic would be calculated to effect as little structural intr cellular or extracellular change as possible. Experienc of other forms of medical electricity has shown tha as a general rule, with the steeper wave-forms not onl is structure less affected but excessive physiologic excitation is avoided (Krusen 1941, MacPhail 1936).

FIRST EXPERIMENT

Electrotechnically, we have found that the simples way of administering a steep-wave current is wit condenser discharge. Accordingly, very early in ou researches we tried to adapt this principle to clinica electroplexy. Our first experiment was unsuccessfu because we did not see our way immediately to overcom the technical difficulties. We should doubtless hav been more persevering, had we not been so agreeabl preoccupied with the clinical successes that we wer piling up with our first portable A.C. apparatus (Straus and MacPhail 1940).

However, when we decided to construct a univers unit—i.e., a unit which could be used on A.C. or direc current (D.C.) mains supply or with a 12-volt battery—we decided that, on electrophysiological grounds alon we ought to try and steepen the wave-form. Fig. 1 i an actual recording of the wave-form produced by ou first standard A.C. mains unit. It is strongly sinusoida and it shows uniform amplitude in both positive an negative phases. Fig. 2 is a recording of the wav produced by our first standard universal unit (*a*) fron D.C. mains, generated by argotrons, and (*b*) from a 12-volt battery supply, generated by vibrators. The argotron-generated current has a much steeper leading front than the normal alternating current, and also has a high frequency spike of fair amplitude in both phases. Th vibrator-generated current has a vertical leading front though the rapid spike-decrement opens out to a lower frequency component. Though the wave-form has bee steepened, the energy factor remains uniform for eac impulse, as shown by the absence of train-decrement.

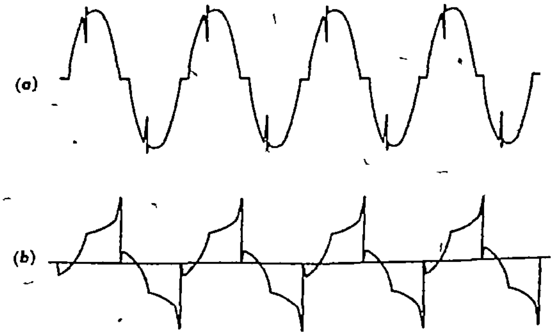


Fig. 2—Wave-form produced by first standard universal unit: (*a*) fron D.C. mains, generated by argotrons; (*b*) from 12-volt battery supply generated by vibrators.

A rapid change in inter-electrode resistance during th first few impulses of the shock current indicates th advisability of using a rapidly damped train of waves. The higher voltages at the beginning overcome the initial resistance, and the subsequent train-decrement ensures that minimal energy is used to induce the fit. In other words, the first few high-voltage impulses initiate the fit, and the subsequent impulses, which taper off rapidly, complete the electrophysiological action. We therefore decided to go back on our tracks and try to overcome the scale, in the centre is the joule-meter registering the dose, and on the right can be seen the shock charge control.

Fig. 7 shows the headgear, which consists of a tempered 'Perspex' band, at the extremities of which are two stainless-steel electrodes, $1^{1}/_{2}$ in. in diameter, having a ball-and-socket mounting. Each electrode-mounting has a plug-hole, $^{1}/_{8}$ in. in diameter, which will take a standard wander-plug of stainless steel.

The use of stainless steel throughout prevents saline attack.

TECHNIQUE

The technique is substantially the same as with previous equipment as regards the general management of the patient and the precautions, but there is considerable simplification in the matter of electrode application and dosage.

The lint pads are well soaked with 20% saline and are sprung on to the temples, where they are self-retaining.

The position of the electrodes should be such that the lower edge is tangential to a line drawn from the outer canthus to the superior attachment of the pinna, at a point at the junction of the anterior and middle thirds of that line. No scrubbing-up or preparation of the skin are necessary.

Since resistance plays a negligible part in the estimation of dosage, it will be found that all patients have a satisfactory major convulsion with 20 joules diphasic or 25 joules monophasic current.

Monophasic current appears to produce slightly less confusion and makes for a quieter recovery. Diphasic current, because of its large peak-to-peak swing, guarantees a major reaction in subjects who are agitated and very restless, and when it might be difficult in consequence to get good electrode contact. In such cases diphasic current will overcome poor contact difficulties.

CLINICAL OBSERVATION

The indications for steep-wave electroplexy differ in no way from those for other types of E.C.T., and the clinical results appear to be identical.

Up to date, we have formed the impression that (1) the convulsions are less violent and sooner over; (2) recovery from the fit is more tranquil and more rapid; (3) the dispensing with scrubbing-up much shortens the whole procedure, so the patient is spared many anxious moments and receives the shock in a more relaxed state of mind and body, which, we are convinced, reduces the liability to muscle-strain and fractures; and (4) the time taken between the patient's mounting the couch and receiving the shock is, with our present type of apparatus and headgear, only a second or two—a great advantage in an agitated or hesitant patient.

SUMMARY

Our previous work on electroplexy has been briefly surveyed to indicate the factors which led us to construct a new type of apparatus.

A method of inducing electrical convulsions by a steep-wave current with a rapid decrement is described.

The technical and electrophysiological advantages of steep-wave current derived from condenser discharge are assessed against the effects of currents with other wave-forms of lower frequencies (including simple alternating currents).

The construction of the apparatus and its use are described in detail.

The clinical advantages to be expected from steep-wave electroplexy are outlined.

REFERENCES

Krusen, F. H. (1941) Physical Medicine, London and Philadelphia.
MacPhail, A. (1936) *J. chart. Soc. Mass. med. Gymn.* 21, 11.
Strauss, E. B., MacPhail, A. (1940) *Brit. med. J.* ii, 779.

PSYCHOTHERAPY OF ULCERATIVE COLITIS

RANYARD WEST
M.D. Lond., D.Phil. Oxfd, M.R.C.P., D.P.H.
EDINBURGH

To call a morbid condition psychogenic or psychosomatic is to recognise that emotions play a large part in its causation. Therefore it is natural to hope that emotions can play a large part in its cure. Sometimes such hopes are realised: too often they are not. A disquieting feature of the psychotherapy of many psychosomatic disorders is a tendency to relapse.

It is important to remember that all psychotherapy works by altering emotions. Emotions are very labile: they are much more easily changed than are most organic states. Often they can be radically altered for a time. But, unless we can introduce a profound new understanding of himself to our patient, or tap an unfailing source of new confidence within his own mind, any temporary relief of anxiety which our self-confident explanations may produce is unlikely to cause more than transitory relief of any complex psychosomatic disorder. The old emotions become reinstated. And a physical disorder may be awaiting their return. Such, for instance, is a case of duodenal ulcer with remissions of duodenal spasm.

How far must one go in psychotherapy? What must one attempt to do? The following cases are recorded because, in demonstrating a real but very precarious psychotherapeutic success in warding off a dangerous organic malady, they offer an opportunity of reviewing our methods of approach to the psychogenic factor in physical illness.

CASE-RECORDS

CASE 1.—A trade representative, aged 36, was admitted to the Royal Infirmary, Edinburgh, on Oct. 30, 1944, complaining of the passage of frequent bloodstained stools. For three months he had passed 6–10 motions daily. He had also had abdominal discomfort and distension, and at the onset of the attack he had vomited five times.

He had had three previous milder attacks. The first was in 1940 just before he was discharged from the R.A.F. with a diagnosis of fibrosis of the lung. It had lasted seventeen days. The second was in March, 1944, and the third in July, 1944. The second attack had lasted on and off for three months, with stool frequency of 6–8 a day, reduced by medicines to 3 or 4 a day.

On admission the patient was very thin and anxious-looking, hollow-eyed, and hollow-cheeked. He looked ill and dehydrated. Muscles poor in tone. Abdomen distended and hypotonic. No abdominal rigidity. Tenderness along cæcum, ascending colon, and descending colon. Per rectum he was very tender, with a very tight anal sphincter and a narrow contracted rectum. The stool contained frank blood, epithelial cells, and pus cells, but no cysts, ova, or abnormal organisms. A barium enema was not given until Nov. 28, when it showed a spastic smooth-walled colon with loss of haustration, and some dilatation of the terminal ileum. Ulcerative colitis was diagnosed.

At first the patient was treated with a low-residue diet, ascorbic acid 150 mg. daily, ferrous sulphate gr. 3, and mist. catechu $^{1}/_{2}$ oz. four times daily, and phenobarbitone or 'Soneryl' at night. He did not improve. On Nov. 4 his weight was 7 st. 6 oz., on the 11th 7 st. 1 lb., 14th 7 st. 6 lb., 18th 7 st. 2 lb. His motions, though less frequent than before admission, were never less than three a day from Oct. 31 to Nov. 14. They continued to be fluid stools containing blood and mucus. Patient continued to eat poorly and to worry over every detail of diet and treatment.

Psychological Investigation.—The patient had vouchsafed on admission that he thought his first and second attacks had been connected with the onset of air-raids in 1940 and the flying bombs of 1944. Thirteen days after admission, on Nov. 11, a fuller history was taken of the relationship of emotion to his attacks of diarrhœa. This showed that his first attack of severe diarrhœa had developed in a military

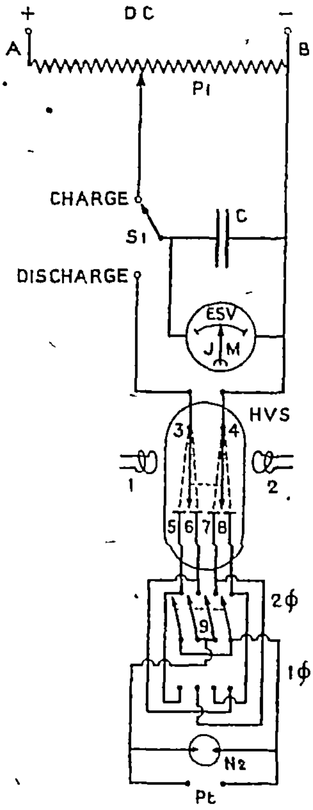


Fig. 5—Fundamental circuit of condenser-discharge E.C.T. unit. For details see text.

of a narrow beam rather than in the diffusely irradiating manner occurring with the much larger A.C. electrode plates.

(2) Seeing that the initiation of a convulsion depends on the impedance-breakdown effect of the first few impulses, it is desirable that the later impulses should show a rapid decrement or damping, so as to minimise subsequent cortical neuronic bombardment, while at the same time ensuring the induction of a major fit.

Fig. 3*a* is the record of the current through the patient, delivered by our new apparatus (monophasic). It will be seen to be a steep box-wave, highly damped, which is, we believe, the most innocuous form of high-energy current to which the central nervous system can be submitted for this purpose. Fig. 3*b* shows the same current produced diphasically.

(3) This is a consideration which arises as much out of the use of condensers as from the actual form of the wave, but which is none the less relevant in this context. It has always seemed to us undesirable and electrically "untidy" in computing dosage to have to reckon in terms of time and voltage and even of current. It seemed to us much more scientific and clinically more foolproof if we could reckon dosage in terms of total energy. A steep-wave current delivered by a rapidly discharging condenser provides the ideal form of electrical discharge to be measured in that way. For obvious reasons, the time-factor does not enter into it, since impedance, on the one hand, and capacity and total discharge of the condenser, on the other hand, determine the natural decrement. We therefore decided to calibrate our shocks in joules rather than in volts.

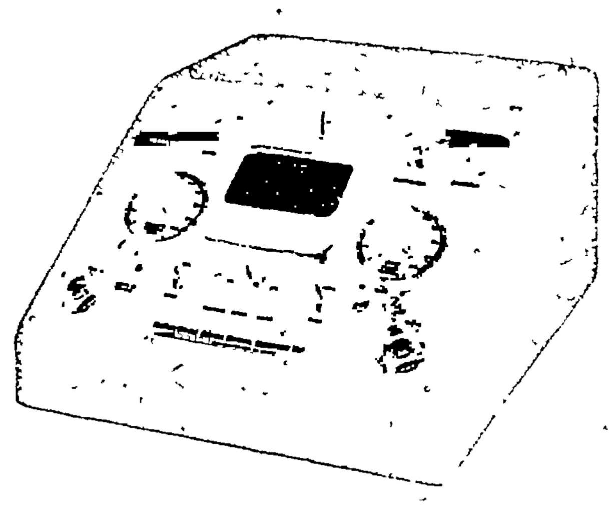


Fig. 6—Universal electroplexy unit with carrier cover removed.

(4) It sometimes happens (very rarely we must admit), when using our earlier types of apparatus, that a patient is found to be almost unconvulsible, even at high voltage and with a long time-base (up to $^1/_2$ sec. and up to 130 volts). It is to be presumed that shocks of this brutal kind (and often three or four are given in succession), even when they do not produce the desired convulsion, are to be avoided as approaching the threshold of damage to nervous tissue. We therefore wished to produce an apparatus which would be calculated to convulse any patient with the first shock.

If the dosage with our new apparatus were calculate in terms of volts instead of joules, the figure woul impress the physiologically uninstructed as being ver high. For example, 15 joules on our new scale corresponds to 300 volts. But it is important from the star to realise that this figure applies to the first impuls only. In point of fact the human brain can stand th transit of momentary peak-voltages in excess of 200 volts without sustaining damage.

Since it is the first impulse or so which initiates th convulsion, with our new type of apparatus we can b

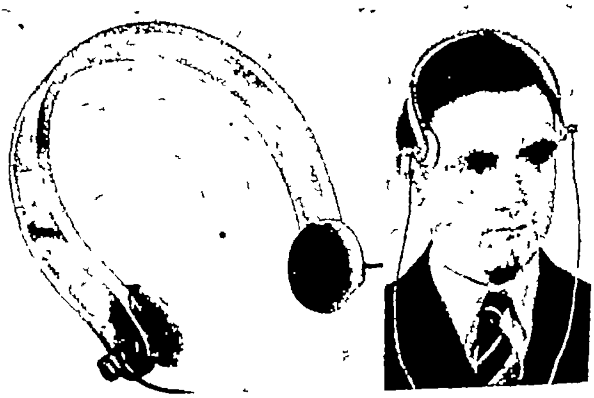


Fig. 7—Headgear.

sure of convulsing a patient with a high-peak first impulse, which we can deliver surely, safely, and conveniently.

DESCRIPTION OF APPARATUS

Circuit.—The circuit, like that of the universal argotron E.C.T. unit, will operate on either A.C. or D.C. mains 200/250 volts or from a 12-volt battery. The circuit is a combination of fig. 4 and fig. 5; from the mains output to the high voltage D.C. source A, B, the circuit is identical with fig. 4. T5 and all the circuit to the right is omitted, since this of course refers to the argotron convertor.

The D.C. source across A, B is applied across the potentiometer P1 (fig. 5). When the switch S1 is thrown to the charge position, the condenser C is charged to a voltage indicated on the electrostatic volt-meter calibrated in joules (JM).

To convulse the patient, the switch S1 is thrown to "discharge," and the charge from the condenser is transferred to the patient via the high-vacuum switch (H.V.S.) through the magnetically operated high-speed switch-points 3, 4 and the fixed switch-points 5, 6, 7, and 8. Switch 9 enables the discharge to occur either monophasically or diphasically. N2 is a neon indicator showing the passage of the discharge. Coils 1 and 2 are the exciting coils producing the high-speed oscillatory movement of 3 and 4.

Apparatus.—The apparatus is illustrated, with the carrier cover removed, in fig. 6. It is about 14 in. square and 7 in. high and weighs 25 lb. The cabinet work is of pressed aluminium finished in hospital cream enamel. On the left of the control panel is the patient's resistance bdominal sensation as dive-bombing had done later, and the ncertainty of his father's moods had been a very important actor in his childhood.

Character Type.—Slight, nervous, and readily truculent. Very short in stature, with a limp dating from childhood. A strong feeling of inferiority ("everybody is before me"), apprehension of violence for which he always felt he must be prepared and with which he was determined to cope. Careful in dress, meticulous in habits. He had become a skilful cook with a very inadequate apprenticeship. Dependent on his wife, but inclined to domineer over her.

On admission: no wasting; pale pasty complexion; abdominal tenderness in cæcal region; frequent passage of fluid stools containing blood, pus, and mucus, but no abnormal organisms.

Barium enema: loss of haustrations and variable spasm of colon. Immediately after the patient was startled by a sudden noise the barium was seen to be shot far into the small bowel.

Sigmoidoscopy: pain and spasm; mucosa much inflamed, œdematous, and readily bleeding, with numerous small superficial ulcers.

Treatment: non-residue diet and mild palliative physical treatment only. Psychological treatment included about twenty hours of elucidation of his character type and the significance of fear and aggressiveness in relation to his bowel contraction, with full recognition by patient of the significance of his early childhood memories in this regard.

Progress: rapid. Urgent fluid stool only after drinking hot tea in the morning. Patient discharged in a month, with decision to give up "arguing"—i.e., offering fisticuffs—and to take a public-house business of his own. He remained well and at work for at least three months, with occasional diarrhœa under stress, but no blood or pus.

Case 3.—A married lady, aged 45, was admitted on Feb. 2, 1946. An only child, at the age of 15 she had lost her mother, to whom she had been devoted. Her father had married again when she was 16, and she had "never forgiven him" for that. *For ten years she had suffered* under the violent temper of her stepmother, who had later been admitted to an asylum. Her father, now aged 77, lived with her and her husband There were two children. Her father was alcoholic, a reprobate and a tyrant. ("I have to wait on him hand and foot.")

Her first attack of diarrhœa, in 1945, had been accompanied by the passage of "white skins" a few days after a New Year's Day celebration of her father's, during which she had found him covered with blood from a fall in the street.

A second attack had occurred in March, 1945. It had been attributed to tinned pork. Her son had had mild, and she severe, diarrhœa. But her father had just taken to bed for ten days, giving her "more work and worry" On March 20, 1945, a female cousin, to whom she had been greatly devoted, had died of phthisis. Thereafter her diarrhœa had become constant, 9 or 10 liquid stools per day and 1 at night, usually thin and brown, sometimes green, with "lumps of red" and frank blood.

Character Type.—Fastidious over food, house-cleanliness, and clothes; sensitive to criticism, tyranny, and tempers, finding her husband "difficult" and her father dirty and untidy. Inclined to get her own way through illness In childhood she had vomited every Saturday after her father had been ill-treating her mother. Readily hysterical. Probably much deep unconscious guilt.

On admission: pale thin anxious face with wide eyes and small mouth. Moderate general abdominal tenderness. Fluid stools containing no abnormal bacilli, cysts, or ova, but pus, blood, and mucus.

Barium enema: absence of haustration in sigmoid and descending colon; walls of ascending colon and sigmoid irregular; appearances those of colitis.

Sigmoidoscopy: œdematous congested mucosa, with extensive superficial ulceration and numerous bleeding points.

Treatment.—Penicillin 30,000 units 4-hourly for eighteen days, sulphathiazole, belladonna, ascorbic acid, 'Luminal.' Severe anæmia (Hb 48%) required two transfusions. Psychological treatment included about twenty hours of elucidation of patient's character type and its relation to the emotional experiences which brought on diarrhœa, all being fully explained to patient.

Progress.—Rapid cessation of bleeding and diarrhœa. Setbacks at all domestic *crises* which were reported to her, until her father was admitted to an almshouse and her husband's working conditions improved. Thence almost uninterrupted recovery. Sigmoidoscopy (March 25, 1946): much improved, but granular mucosa and one or two bleeding points. Thrombophlebitis of one leg followed second blood-transfusion.

Subsequent History.—No return of colitis, patient remaining constipated. Two months after admission, however, and when convalescence was nearly completed, patient passed rapidly into a psychotic state with profound guilt over her treatment of her father, and became demented and bedridden.

DISCUSSION

These cases illustrate characteristic features of ulcerative colitis and raise again the question of the mechanism of its development. The two most striking features of the cases are the prominence of psychogenic factors in causation, and the readiness of remission of symptoms.

Psychogenic Factors.—The connexion between the onset of the symptoms of ulcerative colitis and emotional disturbances, apparently little regarded in the earlier literature of the disease—e.g., Hurst (1921) and Hern (1931)—was fully recognised by Murray (1930), who also noted the frequency of fearfulness, emotional immaturity, strong maternal ties, difficulties over marriage, and emphasised the value of an "unburdening of repressions" in bringing about the intermissions which characterise the disease.

The tendency of patients with ulcerative colitis to be neat and fussy was noted by Sullivan (1935), who also emphasised that their high intelligence was often combined with an inability to throw off the effects of emotional episodes. This neatness and fussiness and the widespread inability to adjust the self to the demands of ordinary adult environment clearly place many cases of ulcerative colitis in the category of the obsessional character type. But Wittkower (1938), following up the conviction of Cullinan (1938) that in ulcerative colitis there were "emotional disturbances superimposed upon an unusual or abnormal personality," showed that among his 40 cases the character types were very diverse. They included 17 obsessionals and 12 hysterics; the obsessionals became ill through inadequate external events interacting with powerful internal conflicts, and in the hysterics the onset of diarrhœa was largely affected by dramatic external events. In Wittkower's series the second group was confined to women. Such diversity suggests that common psychological grounds for ulcerative colitis must be looked for at deep levels of primitive feeling or else in some common emotional drive at the time of the illness. There is psychoanalytical evidence that the tendency for emotion to become unduly linked with one particular bodily system or organ depends on psychological patterns laid down deep in character and early in life. One such pattern is that of Freud's anal type (Freud 1908, 1913), the more passive anxieties of which may possibly lead to a greater distortion of character in men than in women.

Remissions.—In ulcerative colitis there are abrupt but unstable responses to varied treatments (Hern 1931). Dramatic remissions, both of symptoms and of severe ulceration as seen by the sigmoidoscope, have followed the administration of antidysenteric serum (Hurst 1921, Maister 1928). Similar results have followed psychotherapy (Sullivan 1935).

In case 1 we do not know the actual state of the mucosa of the colon, since sigmoidoscopy was *not attempted*; but the contents of the stool and the radiological appearances after a barium enema suggested that severe ulceration was present. At the time of radiography the patient was in a phase of *acute relapse*, emotionally induced. He was passing much blood, mucus, and pus, and was about to lose 1 st. 8 lb. in five days. But during the ten previous days he had passed almost normal stools at normal frequency and had been rapidly gaining weight.

hospital, whither he had gone because of dyspnœa on exertion. At that time (1940) he had been oppressed by the comparative roughness of his military life and by his lack of promotion from the ranks. He had felt that he could have joined the Army as an officer, and he had looked for some recognition of the fact that he had chosen the harder way. Actually he had entered the R.A.F. as a volunteer in 1939, but opted for the Balloon Barrage because he "did not mind defence in war but could not bear to attack."

Immediately after this period in hospital with "bronchitis" and diarrhœa he had secured his discharge from the R.A.F. with a diagnosis of fibrosis of the lung and the comment that he should never have been in the Forces at all. He felt that he had collapsed on the very threshold of danger with the onset of the "blitz," and that his discharge on medical grounds was a thinly disguised defeat of his more courageous self. Yet, once out of the R.A.F., he had rapidly recovered his health.

In 1943 he had been in a civilian occupation which he had felt to be less cultural than the architectural metal work in which he had travelled before the war. He had become unable to deliver the goods to his customers owing to wartime restrictions. He had become "browned off" and worried that he was not really earning his money. So he had resigned his post voluntarily. Shortly afterwards, in March, 1944, there had been some dive-bombing near his home; his nerve had given way, and his diarrhœa had recurred acutely. By June he had recovered.

Next, in July, the flying bombs had come, and "Bang I went again," with gastric pain and diarrhœa, this time with the passage of blood. Not the least of his emotions then had been shame at his pusillanimity in the presence of his seven-year-old daughter, who had been anxious to block the air-vent of the family shelter with her body "to be sure of feeling the blast." By August he had improved again after obtaining a good job in Scotland, entailing security and a new house.

In September, 1944, immediately after seeing a war film, he had been strolling through the streets, brooding on the misery of the world and his inability to secure even himself against injustice, when a precipitating accident, very characteristic of neurotic illness, had happened. A sun-blind outside a shop slid down suddenly and hit him on the head. He had not been hurt, but deeply offended. He had reproached the shopman on the grounds that "it might have been a child that was hit." That same day he had relapsed into his latest and most severe attack of bloody diarrhœa.

The first diagnostic interview closed with an introductory explanation of the effects of emotion on bodily states, including the eliminative processes. Next day the stool frequency fell to two and the patient's weight began to increase.

Five days later (Nov. 16) a second psychological interview was directed to further elucidation of the patient's character type and his boyhood anxieties. His position in the family lay between two girls, with one much younger brother. He was extremely tidy in his habits—a statement borne out by his dapper appearance. His ideal had always been to help, to give way, and to forgive; to set an example and to prove that everybody could be won by kindness—an example which he felt that both his parents had in their turn set him. Sexual feelings had always been much repressed, but for years he had feared that he had caught venereal disease from a totally inadequate boyhood experience. Throughout his childhood, anxiety or injustice had always precipitated diarrhœa. He could not tell a lie.

Such accounts of himself were immediately related to the stresses he had been under in peace and war. This second interview aimed at explaining things to the patient. It contained a rough classification of character types, and a further account of the functions of the colon and its response to emotion. It occupied fully an hour.

Immediately after this interview the stools became normal in frequency (1 or 2 a day) and were usually partly formed. Signs of anxiety vanished. Patient ate well, his face filled out, and by Nov. 22 his weight was 8 st. 3 lb., an increase of 1 st. 1 lb. in twelve days.

On Nov. 28 a barium enema was given by a nurse, clumsily perhaps, but at least without warning to him and causing him pain, intense anal spasm, and renewed acute apprehension. Next day he vomited, and profuse diarrhœa recurred, with oliguria, thirst, and abdominal pain.

On Dec. 2, at a third interview, there was great resentment at the unsympathetic and painful rectal injection. The incident was used to confirm patient's anal sensitivity and his sensitivity to injustice and indignity were canvass more fully than before and related to this physical sensitivity For a few days patient had to be seen daily, each time for short revision of the findings.

The setback lasted a week and was most severe; hi weight fell to 6 st. $8^1/_2$ lb. (Dec. 3) and 6 st. 5 lb. (Dec. 9 But after the first two days he became confident that h would recover, and his recovery when it came was very rapid *This time he gained $1^1/_2$ st. in seven days.* He was discharged on a normal diet less roughage on Dec. 22, and hi weight, which had reached 7 st. $12^1/_2$ lb. before discharge rose rapidly to 9 st. early in the New Year.

For six months after his discharge he was on full work and he only occasionally had fluid stools, lasting twenty four hours and relieved by an opium and catechu mixture During these months he was "a little keyed up" from time to time and had one attack of acute anxiety while driving his car along a well-protected cliff road. Looking back, he now attributed his first attack of diarrhœa to "worry over the war, the state of the world, and the way things were going."

In subsequent months (to December, 1945) he had some return of diarrhœa on the following occasions: (1) on finding that his father, who lived alone, had become senile and was neglecting himself; (2) after rushing in to assist the victim of a motor-cycle accident; and (3) on hearing of the atomic bomb. On the last occasion he had to give up work for eight weeks, during which he could not keep his mind off the subject of Japanese atrocities. The relapse was attended with little loss of weight and no passage of blood. He returned to work nearly free of symptoms, though his stools were more often fluid than solid.

A follow-up for 1946 indicates that this patient suffered from temporary "spasms" and diarrhœa twenty minutes after a threatened road accident in February, while in April a severe relapse occurred immediately on hearing the noise of dive-bombing as a sound-accompaniment to a Mickey Mouse film—a sound which he associated with London air-raid panics and the feeling that "at best half of us may survive." About the same time he became troubled over the appropriate attitude for him to adopt to a new and domineering chief. Treatment by free association was now instituted at his home, but it failed. Despite the recovery of much semi-forgotten memories of the drunkenness and violence of a loved father and other early domestic anxieties, he continued to have diarrhœa, now with much abdominal distension and renewed loss of weight. He was admitted to another hospital, where his physical treatment was active and varied and included blood-transfusions, sulphathiazole, multiple vitamins, charcoal, kaolin, desiccated pigs' intestine, and sedatives. This was accompanied by the psychotherapy of being an interesting case in the eyes of distinguished physicians who demonstrated him as such to students. He slowly improved and was discharged home after two months. Here his convalescence became rapid after he gave up the anxieties of a job among strangers which was on a commission basis. Returning to the south of England he took up work again in the secure, familiar, more appreciative, and less competitive surroundings of his old pre-war firm (December, 1946). We can only speculate about 1947.

CASE 2.—A *chef de cuisine*, aged 34, married but without children, who had served as cook in the Merchant Navy and had been in good health until 1939, was admitted to the Royal Infirmary, Edinburgh, on Jan. 2, 1946, with ulcerative colitis.

The first onset of diarrhœa (thought to be dysenteric) had been in Montreal just before the outbreak of war. A subsequent attack had occurred in 1940 about the time of, but not coincident with, a bombing attack on his ship in the Manchester Canal. During the bombing "something had tightened up" inside him, and he thought this had led to the diarrhœa. In 1941 he had been twice torpedoed and once dive-bombed, but he had taken hold of himself and prevented it from "flying to his stomach." Since he had taken work ashore as a clerk in a shipping office, attacks had come on after dealing with quarrelsome crews. Attacks of sudden diarrhœa had also followed five minutes after drinking a cup of tea. Nowadays they were produced by any sudden noise, such as the back-fire of a car.

In childhood he had been devoted to his mother, and both proud and scared of his father, who had been kind and considerate when sober but violent when in liquor, especially to the mother. Violence from his father had given him the same

Such cases draw attention to the possibilities of psychological diagnosis and treatment in the early stages of ulcerative colitis in which colonic spasm is still (despite the presence of blood in the stools) the predominant feature.

They further serve as a reminder of the extent to which fundamental bodily machinery may be at the mercy of ideas, and of the high degree of reversibility which exists in psychosomatic illness when the psyche can be treated appropriately and in time.

Grateful acknowledgments are made to Prof. J. A. Ryle for much helpful suggestion and criticism, and to Dr. W. A. Alexander and Prof. D. Murray Lyon for permission to publish these cases.

REFERENCES

Cullinan, E. R. (1938) *Brit. med. J.* ii, 1351.
Drury, A. N., Florey, H., Florey, M. E. (1929) *J. Physiol.* 68, 173.
Freud, S. (1908) Collected Papers, London, vol. II, p. 45.
— (1913) *Ibid*, vol. II, p. 122.
Hardy, T. L. (1945) *Lancet*, i, 553.
Hern, J. R. B. (1931) *Guy's Hosp. Rep.* 81, 322.
Hurst, A. F. (1921) *Ibid*, 71, 26.
Liam, R., Porter, J. E. (1939) *Arch. intern. Med.* 63, 201.
Maister, H. I. (1928) *Guy's Hosp. Rep.* 78, 487.
Moschcowitz, E. (1943) *Amer. J. med. Sci.* 206, 576.
Murray, C. D. (1930) *Ibid*, 180, 239.
Ryle, J. A. (1939) *Lancet*, ii, 353.
— (1945) personal communication.
Sullivan, A. J. (1935) *Amer. J. digest. Dis* 2, 651.
Wittkower, E. (1938) *Brit. med. J.* ii, 1356.

FOLIC ACID IN TROPICAL SPRUE

REPORT OF A CASE

Sir PHILIP MANSON-BAHR
C.M.G., D.S.O., M.D. Camb., F.R.C.P.
SENIOR PHYSICIAN

OWEN CLARKE
M.B. Camb.
RESIDENT MEDICAL OFFICER

ALBERT DOCK HOSPITAL, LONDON

THE *treatment of tropical sprue has always been one* of the least satisfactory aspects of tropical medicine, and, despite intensive research in India and elsewhere during the war, no real improvement in treatment was achieved. This report describes the rapid and dramatic recovery of health when a long-standing and serious case of tropical sprue was treated with folic acid.

The patient left England for India in March, 1943, at the age of 27 years; he was category A1, and weighed 10 st. 8 lb. In February, 1944, he first noted that his stools were bulky, greasy, biscuit-coloured, and of unpleasant smell; but, except for purgative pills, he received no treatment before entering Burma for a three months' campaign with the Chindits.

"Inside" he was given three courses of sulphaguanidine, which stopped the diarrhœa but caused vomiting of similar foul-smelling matter, and between the courses the stools became larger and more sprue-like.

In August, 1944, when his weight was 6½ st., he was at last able to get proper treatment, consisting of controlled milk and orange diets, liver extract by mouth and injection, and nicotinic acid.

Neither this treatment nor return to the U.K. restored his previous health, though on his discharge from the Army a year later he could perform light duties The stools were too large and too greasy; he averaged two or three bowel movements daily, and any dietary excess was immediately punished. His weight varied from 8½ to 9 st. but never approached his previous normal.

A year in civil life has been similar to his last year in the Army; even light tasks have taxed his strength, and every moment of leisure has been spent in bed. Special diet, with extra meat, eggs, and milk, twice-weekly intramuscular liver injections, and nicotinic acid by mouth did not prevent the steady deterioration in his appetite and weight, and did not check his glossitis, breathlessness, anæmia, and diarrhœa with bulky, greasy stools. In September, 1946, he again sought hospital treatment.

On admission he was thin, pale, dehydrated, and very listless; *appetite* poor; weight at 7 st. 1 lb. was 3½ st. below normal; skin dry, desquamating, loose, and inelastic, even over a grossly distended abdomen; tongue smooth and sore, with marginal glossitis; typical sprue stools, passed three or four times in twenty-four hours, totalled 24 oz. daily. Blood-count showed megalocytic anæmia: red cells 2,430,000 per c.mm., Hb 50%. The gravity of his condition, especially the emaciation and dehydration, at first suggested that his life could only be saved by continuous drip blood-transfusion.

Treatment.—It was impossible to obtain folic acid for the first week of his treatment in hospital, during which time treatment differed little from his previous routine: controlled diets, predigested milk feeds; liver extract 'Plexan' 4 c.cm. given intramuscularly daily; nicotinic acid 100 mg. daily; and riboflavine 3 mg. daily. There was no pronounced improvement.

Folic Acid.—After a week the only medicine given was folic acid 10 mg. daily for five days by mouth. Liver extract and nicotinic acid were then resumed, and after ten days the plexan was reduced to 4 c.cm. on alternate days.

The effect of the folic acid was dramatic, and must compare with the recovery of the Cuban lady described by Spies et al.[1]

On the fourth day of the course of folic acid the patient said he felt fitter than for many months, his appetite became healthy, *and he was soon allowed full normal hospital diet.* Three days later the soreness of the tongue had ceased, though slight marginal redness persisted: the abdomen was not distended; and the skin had almost completely regained its normal elasticity. Most remarkable of all was the total absence of flatulence or of any abdominal discomfort. Within ten days he was taking exercise outside hospital, and his voice and mental outlook had changed to that of a healthy man confident in his health.

The improvement, as shown by the body-weight, the daily weight of the stools, and the blood picture, is depicted in fig. 1. From the third day of folic-acid treatment he passed only one daily motion, which was soft but formed and had lost the colour and offensive odour of the sprue stool. The total weight of fæces passed had fallen to an average of about 10 oz. daily, though occasional excessive stools continued for a week.

*A fractional test-meal the day after completion of folic-*acid therapy showed no free HCl in the fasting juice, a slightly increased excretion after the meal, and rapid emptying of

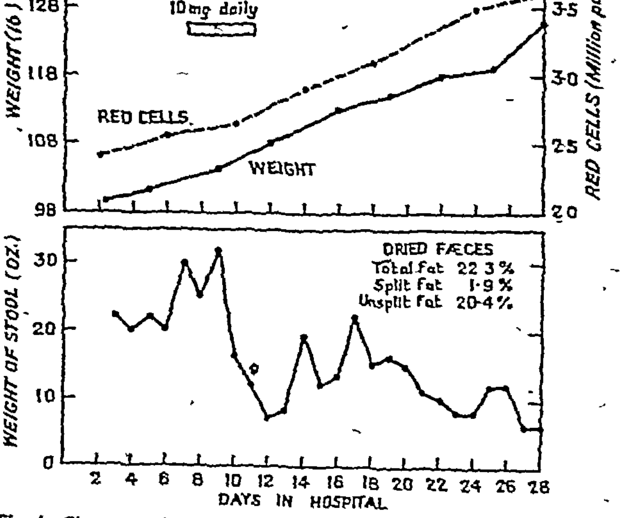


Fig 1—Chart showing rapid improvement of patient with sprue on treatment with *folic acid.*

---

[1] Spies, T. D., Frommeyer, W. B., Garcia Lopez, G., Lopez Toca, R., Gwinner, G. *Lancet*, 1946, i, 883.

The course of events was subsequently reversed again when the patient was again emotionally reassured.

We must ask what common property can be found in the remissions of symptoms by such diverse means as succeed in these cases. This question applies not only to ulcerative colitis but also to some cases of asthma and to many cases of conversion hysteria. Physical agents may be various, and successful psychotherapy may come from various schools and vary much in personal handling. But the common features for the patient are two: (1) in the emotional field there is relief of anxiety; and (2) in the physical field there is relief of a dysfunction which, both in asthma and in colitis, is an overfunction of muscle—a muscular spasm.

Mechanism.—Moschcowitz (1943) has placed ulcerative colitis among "hyperkinetic diseases." Such diseases include essential hypertension, Graves's disease, peptic ulcer, cardiospasm, spastic colon, mucous and ulcerative colitis, manic-depressive psychosis, and paranoia. Their common pathology consists of an exaggeration of normal function. In ulcerative colitis the functions which are increased are tone, peristalsis, and secretion of mucus. Moschcowitz holds that in all hyperkinetic diseases the patient's ego is involved in a maladjustment with his environment.

An experimental attempt has been made to clarify the physical changes of ulcerative colitis by means of explants of the colon of the dog (Lium and Porter 1939). These experiments showed that ulceration of the mucosa could develop within twenty-four hours of the operation if the colonic muscle remained in spasm, and that the ulcers could heal again in 10–14 days if the muscle became relaxed. Colonic muscular spasm and hypersecretion of mucus are produced by various agencies, including mechanical stimulation, acetylcholine or other parasympathomimetic drug, and dysentery toxin. Thus Lium and Porter regard ulcerative colitis as "a specific reaction to a number of influences which can initiate spasm of the colonic musculature." They add that "once the colon becomes spastic it is an organ that can produce severe damage to its own surface structures." The radiological appearances of the "pencil colon" would make it easy to accept colonic spasm as a physical basis of ulcerative colitis, were it not that experienced clinicians incline to regard the "pencil colon" as a more common feature in those cases of colonic spasm which do *not* proceed to ulceration (Ryle 1945).

One further experimental observation deserves recording. It is that fright will cause pallor of the explanted colonic mucosa of the dog, and that additional, more localised, patches of pallor then follow mechanical stimulation (Drury et al. 1929). This reaction is not caused by adrenaline and occurs after adrenalectomy.

It does not then seem an improbable explanation of some cases of ulcerative colitis that anxiety causes muscular spasm and mucosal changes in an organ previously rendered susceptible either by a psychological or a physical sensitisation, or by both. The diarrhœal response to frank anxiety is well known; it is shown by many ulcerative colitis patients, including the present cases. But much of the anxiety of these cases is unconscious; it is part of their unconscious fantasy life. Deep anxiety over problems of emotional aggressiveness characterises both ulcerative colitis and asthma, and they betray their origins early in psychoanalysis. Asthmatics may have colonic spasm, or "colon neurosis," though apparently seldom or never ulcerative colitis (Ryle 1939, Hardy 1945). In both organs the response is parasympathomimetic.

The adrenaline-sympathetic response to emotions which are naturally productive of activity is well known. The emotional significance of overaction of the parasympathetic system is less well understood. From the psychological data it is arguable that that system mediates not only the anabolic phases of nutrition also deep mortal anxiety and fear-of-death complex such as can be found by the psychoanalyst to be associated with deeply repressed aggressive impulses and unconscious guilt. There is a sort of angor animi which occurs in asthma and also sometimes in cardiac neuroses with bradycardia, and a similar mechanism may occur in some cases of ulcerative colitis. But it seems as if psychological mechanisms that could turn one case of deep unconscious anxiety to asthma and another to ulcerative colitis must either be inherent or lie in very early environmental factors. The physical determinants of such organ sensitivities remain unknown.

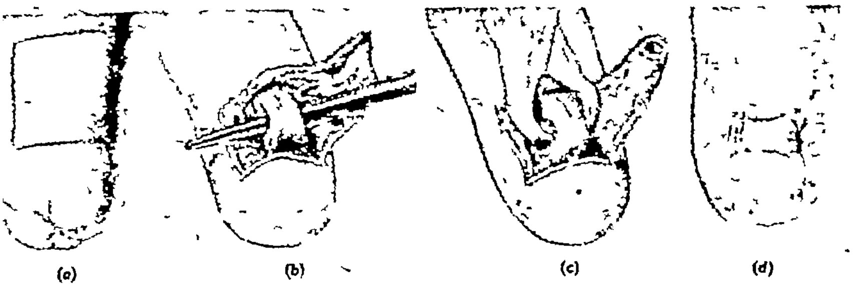
Principles of Treatment.—In the treatment of pathological anxiety accompanied by physical symptoms success may come quickly if the reassurance is intense enough. In all cases the immediate measure of success is the reduction of anxiety and removal of the symptom, the two going hand in hand and reacting on each other. I consider that to relieve anxiety more skilfully the physician should know enough of the Freudian unconscious to guess at some of the underlying psychological mechanisms of the case he is handling, though he must not display these to the patient beyond the stage of innuendo. Only experience can tell the therapist how far he can go without incurring a resistance and repudiation which may involve him in a long analysis. In my opinion this experience can be acquired by the general physician if he will submit himself to a comparatively short period of special training. In case 1, a man of rectal sensitivity who was also of pacifist tendencies, and had an ego-ideal of neatness, kindness, and pleasing others must be expected, ex hypothesi, to harbour problems of repressed aggressiveness. If he does so, his anxiety will almost certainly be connected with those problems. Thus the patient's apprehension over affronts against his person, property, and dignity must be handled with great sympathy, and much of his anxiety must be laid at the door of such affronts. When it comes to interpretation, it is also of immense value to an intelligent man to have an explanation of his bodily symptoms which is at once intelligible and physiologically true. On the other hand, too early or too deep psychoanalysis may expose more unconscious problems than it can alleviate and thus may aggravate, even dangerously, the course of the physical illness.

Essentially what cures a psychoneurotic is an emotional change and not an intellectual one. Anxiety has to give way to confidence in all cases. The feeling that "it's all right now" may come from faith alone, or through faith aroused by works, by increased self-knowledge, or by a soothing hand being laid on a tender spot of half-conscious anxiety or guilt. Arguments too may play their part. Intellectual mastery is one way to emotional satisfaction in the experience of all obsessional characters. There occur opportunities of giving acceptable interpretations and crucial reassurances at many stages in the voyage up that long river of access to the deeply unconscious mind which a traditional psychoanalysis pursues. The object of quick psychotherapy must be to recognise the earliest of those opportunities, steer towards it, secure good anchorage, and discharge cargo.

SUMMARY

A case of severe ulcerative colitis (case 1) is described in which relief followed two sessions of psychotherapy, relapse developed in response to an imagined callous affront, and a considerable measure of temporary "cure" was effected by calculated reassurances based on an assumed Freudian psychopathology.

Two subsidiary cases are recorded with resolution of the colitis, though one patient subsequently passed into a psychotic state in which guilt played a prominent part.



ig. 1—Making the skin tunnel: (a) flap outlined; (b) muscle tunnelled; (c) skin tubed; (d) tunnel through muscle skin-grafted.

Making the Tunnels.—The most important feature, fter having enough length, having muscle present in oth flexor and extensor groups, and having a movable erminal scar, is the making of good tunnels. This is done under local anæsthesia so that the best muscle roups may be selected for the tunnel. The operation akes about twenty minutes. Both tunnels and even oth arms may be done in one sitting.

An area of about three finger-breadths or about 5×5 sq. cm. is mapped out about 5 cm. from the end of the stump. Three sides of this square are freed to form a flap with its base either on the medial or on the lateral side (fig. 1*a*). The flap consists of skin and subcutaneous tissue including the deep fascia. This flap is next formed into a tube with the skin surface on the inside, the suturing being by subcuticular catgut so as not to pierce the skin surface (fig. 1*c*).

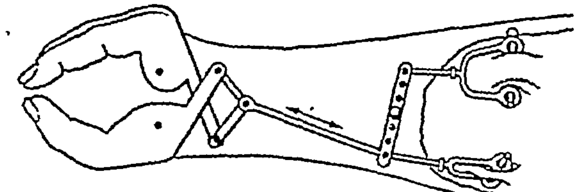


Fig. 2—Forearm mechanism.

The next step is to select the site for the tunnel in the muscle. It must be at right angles to the axis of the limb and in the plane of action of the muscles. On the extensor surface of the forearm it is parallel to the dorsal surface, but on the flexor surface it is at a slight angle with the plane of the radius and ulna, because the main muscle mass bulges more on the ulnar than on the radial side of the forearm. Next, a blunt-pointed muscle dilator is passed through the muscle-fibres along a track about 1·5 cm. long and 0·5–1·0 cm. deep, only a thin layer of muscle-fibres being picked up (fig. 1*b*). The tube of skin is then passed through this tunnel in the muscle and is fixed with three sutures to the skin edge of the side opposite the base of the tube. One suture is taken at each of the four corners of the raw area to close the angles somewhat. A Thiersch skin-graft is cut and sutured in place over the remaining raw area (fig. 1*d*). A soft-paraffin gauze wick is passed through the skin tunnel, and the skin-graft is suitably dressed.

The first dressing is done in ten days. Then the pins, 5–10 mm. in diameter, are inserted. The patient is instructed in care of the skin tunnels with cleansing, alcohol, and powder. Exercises are maintained, and in about three months an artificial limb is fitted.

THE PROSTHESIS

The artificial limbs are of light aluminium covered with leather. There are windows where the pins emerge to be attached to a metal loop at each end (fig. 3). The mechanics of the elbow and hand mechanism are somewhat intricate. The principle of the limb for the forearm is illustrated in fig. 2, and for the upper arm in fig. 4. In the forearm, contraction of the flexor group opens the hand, and contraction of the extensor group closes the hand. In the upper arm, contraction of the biceps closes the hand, and contraction of the triceps opens the hand; a strap from the ipsilateral shoulder pronates the hand, and a spring supinates it again; a strap from the contralateral shoulder flexes the elbow, and gravity extends the elbow. There are locking devices, easily manipulated by buttons on the outside, that lock the elbow in a fixed position, and the forearm in a fixed position of rotation, if desired; and there is one at the wrist that locks the hand grip. It is arranged so that

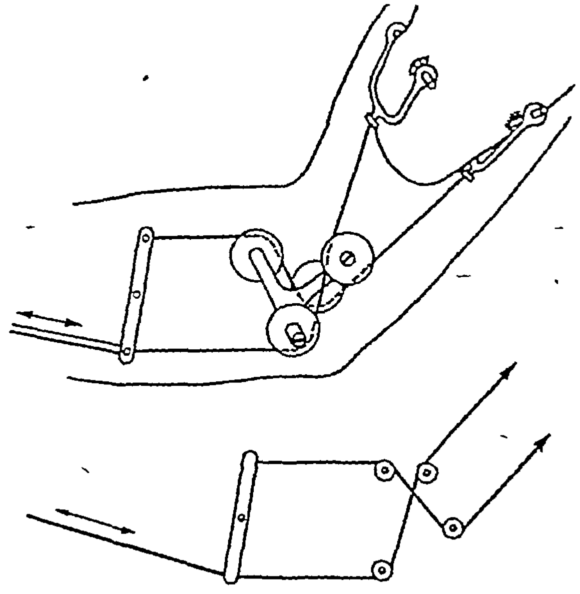


Fig. 4—Upper-arm mechanism.

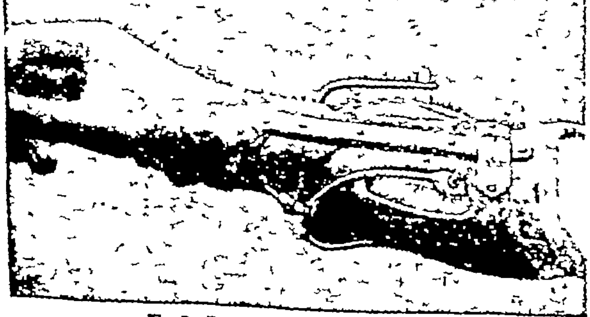


Fig. 3—Right forearm artificial limb.

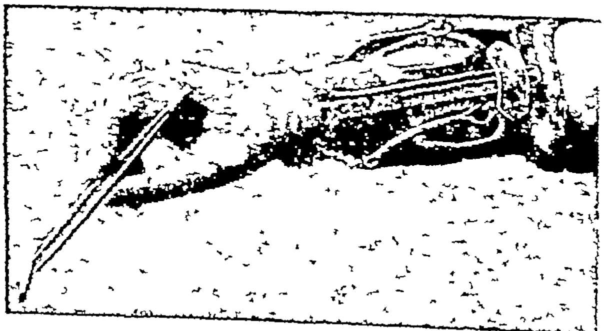


Fig. 5—Patient picking up match with forceps.

the stomach (fig. 2). A fortnight later the test was within normal limits (fig. 3).

DISCUSSION

A minimal amount of folic acid was used—one phial of ten 5 mg. tablets, which was all that could be obtained. Other clinicians in U.S.A., notably Spies et al.[1] and Vilter et al.,[2] have studied the effect of folic acid on the macrocytic anæmias, using doses as high as 100 mg. daily and a total course of over 1000 mg. Such extravagance is still impossible in this country.

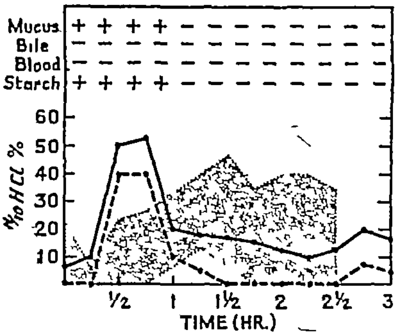


Fig. 2—Test-meal findings on the day after completion of course of folic acid.

Perhaps such large doses are necessary to obtain prompt hæmopoietic response in cases in which macrocytic anæmia has long been untreated and folic acid is a substitute for liver therapy. Spies emphasises the importance of ensuring that no previous treatment is still acting during the experimental period.

This report, however, primarily concerns the nature of the stools and the well-being of the patient. The hæmopoietic response was pronounced but not dramatic, owing to the long previous liver therapy and the consequent absence of very severe macrocytic anæmia at the start. Nevertheless, some credit must be given to the folic acid, since the previously resistant anæmia then started to improve and continued to improve after the resumption of liver injections.

Similarly, the immediate improvement of the stools was most remarkable; and, though there were subsequently a few days when they were too bulky, diarrhœa did not recur, and a fairly constant daily total amount of fæces was passed, which on analysis of the dried stool for fat gave figures compatible with normal (fig. 1). This may have been due in part to the improvement in the anæmia, but there is no doubt that folic acid was the immediate cause of the improvement, and that this continued even after folic acid had been withdrawn.

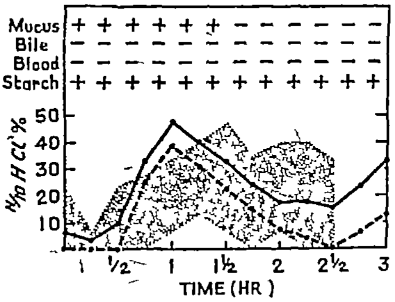


Fig. 3—Test-meal findings a fortnight later than in fig. 2.

Perhaps folic acid may provide the switch by which the vicious circle of these diseases can be reversed, after which further recovery can continue without its aid.

SUMMARY

A case of tropical sprue, which had resisted the usual treatment for two years in India and England, was treated with folic acid, 10 mg. daily by mouth for five days, whereupon there was a very rapid and great improvement, which has been maintained since the folic acid was discontinued. The patient now (Nov 21) weighs 10 st. 7 lb. and is in perfect health.

---

[2] Vilter, C. F., Spies, T. D., Koch, M. B. *Sth. med. J., Alabama,* 1945, 38, 781.

SAUERBRUCH CINEPLASTIC AMPUTATION

R. K. MAGEE
B.A., M.D. Toronto, F.R.C.S., F.R.C.S.(C)
MAJOR R.C.A.M.C.; SURGEON, PETERBOROUGH CLINIC, ONTARIO

THE cineplastic amputation of Sauerbruch was described at the International Conference on Amputations in Ottawa in 1943 by Kassler, who is one of its exponents in America. A recent visit to Sauerbruch's clinic in Berlin enables me to describe the method used there now, including modifications introduced since 1943. Prof. P. Gohrbandt, chief assistant at the clinic, kindly arranged for surgeons, limb-makers, secretarial staff, interpreters, and patients to give their full time to completing this survey. There were some 30 inpatients awaiting some phase of the treatment, and the study included photographs to illustrate the principles of the operation and of the prosthesis used.

SELECTION OF CASES

The cineplastic amputation is applicable only in the upper limb. As is well known, the success of an artificial limb depends primarily on the patient's will to succeed. As a result, the dexterity achieved with the limb is enhanced in bilateral cases, where the patient is forced to use the limb, and it is greatest in the more intelligent patients. Accordingly the cineplastic amputation is chosen more for bilateral cases and with consideration for the patient's intelligence and the type of work he will be doing, though some believe it is the best amputation with adequate screening even in unilateral cases, provided that patients without the necessary intellect or will to succeed are excluded.

The youngest patient in whom this method was used was 8 years old. The shortest stump in the forearm in which it may be used is 7–8 cm. from the anterior elbow crease. In shorter forearm stumps a tilting ring type is used with the same hand mechanism. The best results are obtained in forearm amputations, but upper-arm amputations may give nearly as good ones.

PRINCIPLE

Unlike earlier methods of suturing tendons into loops and covering them with skin, the principle now adopted consists of making skin-lined tunnels through the flexor and extensor groups of either arm or forearm muscles (fig. 1). Through each tunnel is passed an ivory pin, which is connected by a chain to a bar, much as the two traces are used in harnessing a horse to a cart. From the lower end of this bar a metal rod goes to the hand mechanism. The hand mechanism operates like a Cornet's forceps of which one side is the thumb and the other side the index finger and the rest of the hand. Thus, pushing forward on the rod opens the hand, and pulling back on the rod closes the hand and approximates the thumb and index finger with a grip of appreciable power (fig. 2).

METHOD

The sine qua non of this operation is a movable scar at the end of the bones, inasmuch as the degree of up-and-down movement of the pins determines the extent of opening and closing of the hand that will result. Since many amputations were done under war conditions and have fixed scars, reamputation is often the first step. The bones are divided 2–3 cm. shorter than the muscles; and the deep fascia, but not the muscles, is sutured over the ends of the bones to give a free scar. Within 5–10 days active exercises and massage are instituted, and constant practice is insisted on so that the patient learns to pull the terminal scar backwards and forwards.

Medical Societies

ROYAL SOCIETY OF MEDICINE

THE psychiatry section met on Dec. 10, with Prof. AUBREY LEWIS, the president, in the chair, to discuss

Leucotomy as an Instrument of Research

Dr. A. MEYER and Dr. T. MCLARDY showed from observation of 27 brains how great are the unintentional variations in the leucotome's cut. The bilateral lesion through the whole of the white matter, generally aimed at, is rarely attained; the most medial regions of the white matter are seldom involved, and the striate body is often damaged.

Interruption of the thalamo-frontal radiation connecting the dorsomedial nucleus of the thalamus with the prefrontal region is widely considered to constitute the rationale of prefrontal leucotomy. Walker concluded from his study of this projection in monkeys that a dorsoventral axis of the prefrontal lobe corresponds roughly to a lateromedial axis of the dorsomedial nucleus. Dr. Meyer's observation of human brains has confirmed the existence of an organisation similar to but more complex than that described by Walker; the projection of the magnocellular part of the nucleus is limited to the medial half of the orbital cortex, comprising area 12 and part of area 11. Since the magnocellular nucleus is connected with hypothalamic centres, it may be assumed that this orbital projection forms part of a pathway serving autonomic functions—a pathway which may well furnish the substrate for recent physiological findings from which workers have postulated a vagal cortical representation in the orbital region. This pathway might explain some of the autonomic changes which may occur after prefrontal leucotomy.

As regards long association fibres, prefrontal leucotomy should involve the superior frontal, cingulate, subcallosal, uncinate, and inferior fronto-occipital fasciculi. So far, said Dr. Meyer, degeneration has been seen only in the uncinate, the cingulate, and the most medial part of the superior longitudinal fasciculi.

The concepts of localised and holistic mental function are not mutually exclusive; they are complementary. The psychiatrist has long been accustomed to a pluridimensional approach to diagnosis; in other words, the results of cerebral lesions must be evaluated in relation to the individual's constitution, life history, age, and present environment. The contention that the frontal lobes are particularly concerned in the highest mental activities would seem to require qualification in the light of recent work; for instance, the volume of the frontal lobe is not significantly greater in man than in the chimpanzee—in striking contrast to the temporal and parietal lobes which steadily enlarge from monkeys to man. A specific personality change from frontal-lobe lesions has not been generally accepted: further studies of leucotomy should give a decisive answer.

ELECTROENCEPHALOGRAPHIC STUDIES

Mr. G. D. GREVILLE, PH.D., and Dr. S. L. LAST said that in 35 cases operated on by Mr. G. C. Knight, using Freeman and Watts's together with Crombie's technique, it was found that after operation the voltage of the alpha rhythm (8–13 cycles per second) tends to increase, as also does the amount; these changes may be due to better relaxation. On the other hand, the voltage of the fast activity (over 13 cycles per second) tends to decrease, as does its amount.

Delta activity (under 4 cycles per second) was found at one time or another in more than half the cases; it usually appears, if at all, one day after operation, and certainly within the first ten days. Immediately after operation it may occur all over the cortex, but soon it becomes prominent in the frontal areas; there may then be some extension to central areas, but this gradually disappears during the first three weeks. The material shows no correlation between age and the occurrence of delta rhythm; but this rhythm appeared a little more often in those with clinical improvement than in those with none.

Theta rhythm (4–7 cycles per second) is more common than delta and tends to persist much longer.

AUTONOMIC CHANGES

Dr. F. REITMAN reported an investigation of vagus function after leucotomy. Operation, he said, is followed by a slight increase in the total gastric acidity; the peak of total acidity is reached earlier, and the emptying-time is quicker. Moreover the total volume of gastric juice following the intravenous injection of 'Prostigmin' 1 mg. is greater after operation.

MENTAL FUNCTION

Dr. M. B. BRODY said that patients do intelligence tests as well after as before operation. Nor is there evidence of deterioration in abstract thinking, as judged by the Goldstein tests. Goldstein, however, has reported deterioration, basing his conclusion on an analysis of behaviour. It would seem that after leucotomy the capacity is unimpaired but that the patient does not use it except under the stimulus of test conditions. The prefrontal area thus plays no part in mental tests. It may be that the capacity depends on integrated activity of the cortex as a whole or on some area other than the cortex: in Pick's disease, for example, mental changes are correlated with changes in the dorsomedial nucleus of the thalamus. It may be that ideation is intellectualised emotion. What is needed is a standardised approach to the study of all mental changes.

New Inventions

MUSCLE FORCEPS FOR SQUINT OPERATION

THE instrument (fig. 1) is built as an artery forceps and has two catches. It grips the muscle firmly and does not slip. The shanks are bent at an angle of 30° so that the hand controlling the forceps is not in the way of the hand holding the hook. The blades have notches on both edges to guide the needle, and should be applied so that the notches are symmetrically disposed in relation to the muscle.

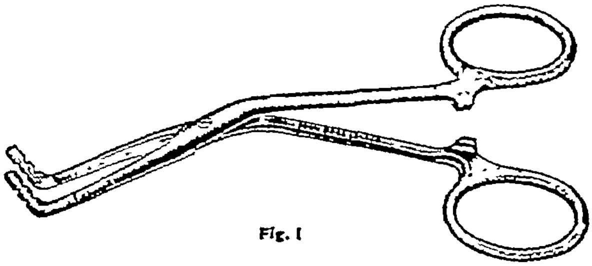


Fig. 1

The shaft of the forceps is grooved 6 mm. from the proximal edge of the blades. This mark, in conjunction with a pointed hook, can be used for measuring or estimating the distance from the line where the forceps grips the muscle.

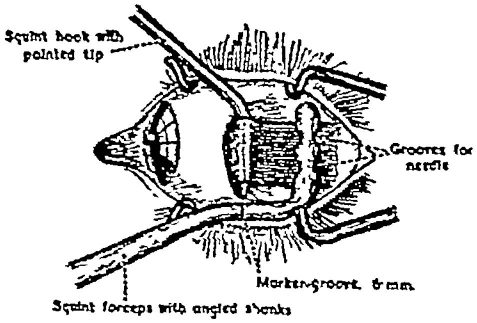

Squint hook with pointed tip
Grooves for needle
Marker-groove, 6 mm.
Squint forceps with angled shanks

Fig. 2

Fig. 2 shows the use of the instrument during operation. Naturally, the hook can be inserted from beneath, and the forceps from above, if preferred. Both the forceps and the hook have been made for me by Down Bros. and Mayer & Phelps Ltd.

M. KLEIN, M.D. Pécs, D.O.M.S.
Associate Surgeon and Biochemist,
Central London Ophthalmic Hospital.

the muscles grasp an object—e.g., a pencil—between the thumb and opposing hand, then by locking the hand mechanism the grip will be maintained without muscle effort (fig. 5). The hand can close further but cannot open.

RESULTS

Patients at Sauerbruch's clinic demonstrated the movements that they had learnt. They could write with normal legibility and could pick up a match with forceps (fig. 5) or with the hand, pick out a cigarette and light it, and attend to their clothes. They showed the strength of the limb by lifting up and carrying a pail of water. Some described the development of a sense of touch whereby they could distinguish, for example, a watch from a pencil in a pocket. One patient with both forearms amputated had been a switchboard operator at the hospital for some years but had been killed by a bomb.

CONCLUSION

The cineplastic amputation as developed by Sauerbruch appears to have the advantage of permitting more dexterous movements under more normal muscle control than prostheses utilising special accessories for special routine tasks. To the intelligent man with a bilateral amputation of the arm or forearm this may offer a wider range of less stereotyped activity, which may open to him wider spheres of enjoyment and employment.

RETINAL MECHANISM OF VISION

F. W. Edridge-Green
C.B.E., M.D. Durh., F.R.C.S.
SPECIAL EXAMINER AND ADVISER ON VISION AND COLOUR VISION TO THE MINISTRY OF TRANSPORT

A SIMPLE experiment shows that the stimulus in vision is photochemical and movable in the retina. If a bright light on a dark ground is looked at for the shortest possible time, with one or both eyes, and then the eyes are closed and covered, a positive after-image of the light will be seen. If the eye or eyes are moved *to the right*, the positive after-image will change its relative position in the field of vision, moving to the right of the negative after-image which is seen clearly defined at the fixation point. The positive after-image is distorted, but not the negative.

When an object is moved in front of the eyes, and the eyes are kept still, multiple objects are seen, owing to the persistence of vision, which is the basis of cinematography. This persistence of vision is due to the positive after-image, as can be shown by numerous experiments. It will be noted that there is no apparent persistence of vision when the eye is moved—not even a trace of a blur. If there were persistence of vision when the eyes are moved it would be difficult to read, because the type would appear confused, as it does when a book is moved in front of the eyes.

The positive after-image which causes persistence of vision can be seen when it is looked for. When the eye is moved to the right, the external rectus, on contracting, besides moving the eye to the right also presses on the back of the eye, *shifting the photochemical fluid* in the interretinal space to the right, so that the image of the *object appears* to the right of the fixation point. This image appears distorted and may even appear broken up. Thus a small chromium clock will appear distorted though clearly recognisable. If a small red square 1 cm. × 1 cm. is viewed at a distance of 2 metres on a white ground, and then is shifted rapidly to the left, it will be followed by several red spots resembling the microscopical appearance of the cones in the retina.

An easy method of seeing the shifting of the positive after-image is as follows. A white flower is placed on the right of a red one and viewed at a distance of 3 metres. If the observer looks first at the red flower and then transfers his gaze immediately to the white one, the white flower will be seen clearly, but the red positive after-image of the red flower will be seen on the right of the white flower.

In the past there has been much discussion about why moving objects are occasionally seen quite clearly momentarily, as if stationary, but the conditions in which this occurs can be defined. When the eyes have been moving and suddenly fixate a moving object, they momentarily see this object quite clearly, as can be seen with a speaker in a cinematographic picture, or a moving cricket or tennis ball.

FUNCTION OF THE INTERRETINAL FLUID

Vision takes place through sensitisation of the fluid in the interretinal space which surrounds the cones. This fluid is sensitised by the visual purple, the rods not being percipient elements but the nerve elements regulating the sensitising of this fluid. The cones are the sole percipient elements, but they are sensitive not directly to light but only to the photochemical changes in the liquid surrounding them. The response to the perception of form corresponds to the cone distribution of the retina. Marshall and I have seen and demonstrated the visual purple in liquid form surrounding the cones in the fovea (Marshall and Edridge-Green 1902). Kühne (1878) found the visual purple in liquid form in the retina of a shark, but he did not recognise the significance of the observation. The remarks of Hartridge (1946), therefore, can only apply to the cones.

I have always classified the defects of colour perception of mankind according to the number of distinct colours seen in a bright spectrum, naming them as heptachromic, hexachromic, pentachromic, tetrachromic, trichromic, dichromic, and totally colour-blind.

The fovea may at one moment be the most sensitive part of the whole retina, and the next moment the least. Various currents in the field of vision, not due to the circulation, are due to the flow of currents of sensitised retinal fluid.

In certain conditions the central portion of the retina becomes insensitive to light while the remaining portions remain sensitive. If a piece of black velvet is attached to a dark door, and a pin in the centre of the velvet is viewed from a distance of 3 metres in a dull light, the velvet *and then the door* will disappear, the wallpaper appearing to meet over the door, with corresponding contraction of the field of vision.

If a piece of black cardboard about 30 cm. × 15 cm. is placed on a persian carpet or wallpaper, and viewed at a distance of 3 metres in a dull light, the pattern of the carpet or wallpaper will appear to invade the black cardboard until the whole card seems to be covered by it. The cardboard appears to have become transparent, *and the carpet appears to be visible through it.*

The influence of one colour on another may be seen if on half of a pale purple ground there is a bright green pattern, and on the other half a bright purple pattern. The ground with the green pattern will appear green, and the ground with the purple pattern purple. Or if one takes two strips of pure green and places two yellow strips adjacent to one green strip, and two violet strips adjacent to the other, the green with the yellow *adjacent will appear yellow-green, and the green adjacent* to the violet will appear blue-green or blue.

None of the above observations is idiosyncratic. Each had been confirmed many times before publication by observers who did not know what they were expected to see.

REFERENCES

Hartridge, H. (1946) *Nature, Lond.* 158, 303.
Kühne, W. (1878) On the Photochemistry of the Retina and on Visual Purple, London, p. 34.
Marshall, C. D., Edridge-Green, F. W. (1902) *Trans. ophthal. Soc. U.K.* p. 300.

HORMONES ORGANON

Physiological Agents
for Precision Therapy

HORMONES

Oestrogens	Gonadotrophins
Androgens	Thyrotrophin
Progestogens	Corticotrophin
Desoxycorticosterone acetate	Whole anterior pituitary extract

LIVER EXTRACT

and

VITAMINS

Also the following

ANTAGONISTIC SUBSTANCES:

Methyl Thiouracil

Dicoumarin

For literature, etc., send card to:

ORGANON LABORATORIES LTD

BRETTENHAM HOUSE, LONDON, W.C.2

TEMPLE BAR 6785

MENFORMON, RAND, LONDON

AGENTS THROUGHOUT THE BRITISH EMPIRE & MOST OVERSEAS TERRITORIES

Pioneers in Hormone Research

Reviews of Books

An Introduction to Clinical Surgery

CHARLES F. M. SAINT, M.D., M.S., F.R.C.S., F.R.A.C.S., professor of surgery, University of Cape Town. Cape Town: for the Postgraduate Press by the *African Bookman*. Pp. 293. *25s.*

Prof. Charles Saint is due to retire after 25 years of surgical teaching at the University of Cape Town. Those who served with his students in the Middle East and Italy, and saw the care of the wounded in South Africa, know of the high standard of his teaching. This book is a fitting epilogue to his labours. Disciplined in the school of Rutherford Morison, Professor Saint believes that the student must not only appreciate nature's methods but must get the habit of orderly examination of the patient; he must learn that diagnosis is not for the sauntering gaze, that "spot" diagnosis is an evil, and that the mechanism of the patient's pain must be analysed. To illustrate these principles he has packed into this book a mass of clinical experience, described in memorable phrases: "A firm narrow tongue with a point like a spearhead usually indicates good health and a good appetite"; "in the small breast there is much less intervening tissue to traverse before dissemination occurs"; "the patient attaches much more importance to the claudication than to the ulcer on his toe, whereas actually the toe condition is far more serious from the angle of preservation of the limb and possibly his life." Two outstanding chapters are on appendicitis and peripheral vascular disease.

The main responsibility of the surgical teacher should be the quickening of all the senses of the student, and among these Professor Saint includes common sense. That quality, above all others, pervades his book.

Milk: Production and Control

(2nd ed.) WM. CLUNIE HARVEY, M.D., D.P.H., M.O.H. for Southgate; HARRY HILL, F.R.San.I., A.M.I.S.E., F.S.I.A., sanitary inspector for Axbridge R.D.C. London: H. K. Lewis. Pp. 512. *37s. 6d.*

THERE have been numerous changes since 1935 in the handling of milk, many of which are described in this book. The chapter on heat treatment, including a description of the new high-temperature short-time process, will be valued by medical officers of health and sanitary inspectors; and, as before, the chapter on milk legislation is a handy compendium. Methods of cleaning rail and road tanks are not considered, though they are of some concern to the dairies in many of our large cities; and the section on bottle-washing is a little disappointing. The recommendation that the final treatment of all bottles should consist in sterilisation by steam is impracticable with the continuous method of processing and bottling. More attention might perhaps have been paid to the design of milk bottles, particularly with respect to the pouring lip; but taken as a whole the book remains a useful guide, and this second edition is welcome.

Les phénomènes d'allergie non spécifique dans la tuberculose et les fièvres typhoïdes

JEAN ALBERT-WEIL. Paris: Librairie Maloine. Pp. 83.

THIS essay on the pathogenesis of infectious diseases, with special reference to tuberculosis and typhoid fever, is largely a review of the published work bearing most nearly on the author's view that non-specific allergy contributes as much to the production of disease as do specific factors. Inspired by a lecture of Prof. R. Leriche, he accepts the view that the various mechanisms of allergy play an important part in the fundamental processes of infectious diseases. Except in overwhelming infections the make-up of the patient—his diathesis—contributes considerably to the severity of the disease; in certain cases there would be little or no illness following infection but for the responses of the body. The anatomical lesion causes satellite phenomena of a vasomotor type which may be of more clinical importance than the anatomical lesion itself. In the production of such a disease as tuberculosis specific allergic reactions play their part; but non-specific allergy and the reactions of a hypersensitive vegetative nervous system are responsible for certain pathological processes such as the hæmorrhagic complications of infectious diseases. The mechanisms of non-specific allergy are not well known, and this book presents them fully and lucidly with special reference to the phenomena of Sanarelli and Shwartzman. In non-specific or hetero-allergy the animal is sensitised to one substance and reacts allergically to others. The sensitising or "preparatory" substance is of the nature of a complete antigen; the second or "provoking" substance is a simpler chemical and includes a wide range of substances such as starch, agar, bacterial preparations, and animal sera. Dr. Albert-Weil's theory is that such a mechanism plays an important part in the onset and evolution of lesions. He follows Friedmann in attributing hetero-allergy to a reaction not of the tissues but of the vegetative nervous system, which, in the course of many infections, acquires a sensitivity to many antigens. The provoking substance may be organisms other than the specific causal agent of the disease; but his emphasis on *Bact. coli* as a common agent in the pathogenesis of disease is reminiscent of a phase of British medicine which passed with the death of a famous surgeon.

Diabetes

A Concise Presentation. HENRY J. JOHN, M.D., F.A.C.P., lieut.-colonel M.C.A.U.S., Cleveland, Ohio. London: H Kimpton. Pp. 300. *17s.*

THIS is a difficult book to review fairly. It aims at helping "the busy practitioner to rationalise and to utilise the current knowledge on diabetes," but it often tackles diabetic problems with too much theoretical and too little practical detail. The English is not very clear, some sentences having no subject and almost no object. The book covers the usual range of diagnostic tolerance tests, insulin, diet, and so on, but its practical dictates are not well arranged or easy to find. Nevertheless there is much of interest to read of Dr. John's long and wide experience of diabetes. He has always been interested in glucose-tolerance tests, and his definition of the normal is that generally accepted. What makes the book fresh and unusual is his constant recourse to the particular and the personal—detailed descriptions of his cases and personal remarks about them. The whole book is interlarded and enlivened by these reminiscences. His personal tastes and interests predominate and make sections on hyperthyroidism and the salivary glands full and absorbing, whereas subjects of such importance as cardiovascular and eye complications are not even listed in the index. It is hardly a practical book, and certainly not a reference book, but it is an interesting expression of the personality and vitality of the author.

First Aid to the Injured

(Supplement.) St. John Ambulance Association. Pp. 32 *6d.*

THE last issue of the "First Aid Textbook" of the St. John Ambulance Association was published in 1937; this short supplement embodies the knowledge gained by the experiences of the late war. There is a good account of shock, emphasising that the patient must go to hospital because he will almost certainly need transfusion. The dangers of overheating are well stressed. For transport of the fractured spine the supine position is advocated: though it is not made clear why there should be any greater risk in leaving him in the prone position, into which he will usually be turned for reduction of the fracture. Good rules are given for the treatment of the incised wound, on the use of local pressure, and on elevation of the limb to cope with venous oozing. Advice on the treatment of burns is to avoid the breaking of blisters, apply only saline or soda bicarbonate solution, meddle as little as possible, and keep the patient warm. The special appendix on the rocking-stretcher method of artificial respiration is also sound: "commence Schafer's method of artificial respiration. Do not take the patient to the rocking stretcher; the stretcher must be brought to the patient." Medical students might profitably study the diagram on the last page showing how to arrange the blankets to keep the patient warm; this method could be used for patients leaving the operatin

THE LANCET

LONDON: SATURDAY, DEC. 21, 1946

Risk or Opportunity ?

THE profession has given the negative answer. Why ? Firstly, because the leaders of the British Medical Association have presented a partial picture f the National Health Service scheme, continually mphasising its risks and imperfections rather than its opportunities. Secondly, because practitioners are ndignant at the Minister's handling of the dispute over insurance capitation fees. Thirdly, because t was widely, if erroneously, felt that proper consultations had never been held. Fourthly, because Mr. BEVAN would not renounce the basic salary, though this was not essential to his project. Fifthly, because Willesden provided a gratuitous example of political interference in medical work. Sixthly, because restrictions, controls, and loss of privileges have bred in the middle classes a mood of irritation in which they gladly canalise their grievances through the answer No. Lastly, because the Act gives the Minister power to create a bad service (Not a conclusive reason, perhaps, for refusing to help him to create a good one.)

When the B.M.A. council met last week its more experienced members must have known that the majority—then thought to be 56–44% but now nearer 54–46—does not justify non-coöperation with the Government of the day. They must have known how resistance at this stage would strike the public, which is tired of sectional bodies that prefer direct action to negotiation. On the other hand, if they decided to continue negotiations they would have the unenviable task of explaining to their constituents why the majority vote was being ignored. If the necessity for a two-thirds or three-quarters majority had been explained before the plebiscite, the rupture of negotiations could have been averted. As it was, a situation has been allowed to develop in which the B.M.A. finds itself standing bravely, on untenable ground, with little over half its forces mustered.

The council's decision has yet to be ratified by the special representative meeting called for the end of January. But the representative body of the association is representative only in the sense that it represents the majority in each division,[1] and, since the distribution of Yes and No is fairly even throughout the country, the large minority will as usual have few spokesmen. We may take it therefore that the B.M.A. has now effectively dissociated itself from the shaping of the National Health Service at its present most critical stage, and that it will discourage doctors from advising the Minister or accepting any kind of appointment such as membership of a regional board. But though the association held 16 out of the 32 places on the Negotiating Committee, there are a number of other constituent bodies which may have different opinions about the proper attitude of the profession at this moment. For example, judging by their attitude so far—which seemed to find no expression in the committee's report sent out with the voting papers—the governing bodies of the English colleges are unlikely to refuse counsel to the Minister on matters within their own sphere. Where he is deprived of the help of official bodies, Mr. BEVAN can turn to unofficial advisers—who will at least have the merit of wanting the Act to succeed—or can evolve regulations within his own office. The one action he cannot possibly be expected to take is to introduce an amending Bill as prescribed by Dr. DAIN.[2]

Though the Minister cannot go back to Parliament and ask it to reverse major legislative decisions, he could conceivably compromise with the B.M.A. by altering the time-table of his scheme. This is the proposal lately made by Sir HENRY BASHFORD,[3] who suggested that the Government should go ahead with their plans for hospital and specialist services but should leave general practice as it is. In so doing they would be following advice given to their predecessors by Lord DAWSON and others who wanted progress by stages: moreover, any good compromise has charms for men of good will, especially at the present season. But the Government's programme of social reform has now gone so far that only the united opposition of the profession could enforce such a capitulation. The Bashford plan would do nothing to remove the economic barrier preventing housewives and children from seeking early aid from their doctor; indeed by providing a free hospital service it might lead patients to short-circuit general practitioners whenever they could. It would do nothing to distribute doctors better, to equip them better, and to encourage their coöperation with each other or with public-health workers, or to employ demobilised doctors satisfactorily. Nor would it provide machinery through which the new benefits of the National Insurance Act and the National Health Service Act could be satisfactorily administered. The compromise, in fact, will not serve.

The Minister announces that the full scheme for a comprehensive medical service goes forward. It remains for him to persuade us that it will preserve those things we rightly value: but in confining its present rôle to destructive criticism the principal medical organisation has made a mistake; and unless the representative body reverses this decision the profession will be split. Even so, however, there need be no more than a sober agreement to differ for the time being. When the scheme is complete enough for judgment there will be a chance for united participation, or united opposition, based on facts rather than emotion; and in either case the profession could regain its effective unity. Meanwhile, with so close a division of opinion on policy, the majority will be wise to refrain from accusations of disloyalty against colleagues who mostly have the same causes at heart. Everyone who understands this conflict will recognise that honest and intelligent people can hold opposite views about it. To some it is natural to emphasise risks, to others opportunity. For our own part we see in the new service a chance of realising great aims. All forms of organisation are alarming and may be dangerous to freedom; but those who concentrate on the dangers of standardisation and regulation forget the strength of the English genius for liberty,

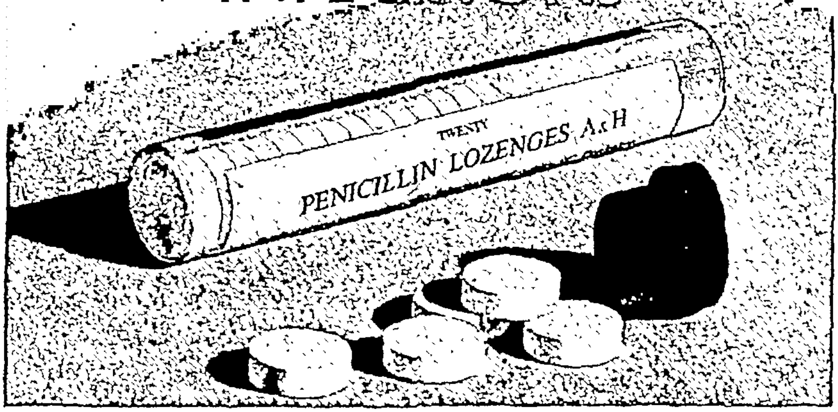
---

1. See *Lancet*, 1944, ii, 84.

2. *Brit. med. J.* Nov. 16, p. 747.

3. *Times*, Nov. 19, p. 5.

RATIONAL THERAPY IN BUCCO-PHARYNGEAL INFECTIONS



The Twenty-Lozenge Pack

Penicillin Lozenges A & H are issued in glass tubes to prevent inactivation of the penicillin by atmospheric moisture.

The number of lozenges contained in the tube (TWENTY) provides the most suitable package to meet the needs of individual treatment prescribed by the physician. Not only does it tend to eliminate waste but it assures the prescriber that the lozenges will not have time to become inactivated by exposure to a moist atmosphere before the prescribed treatment is completed.

Penicillin Lozenges A & H are indicated for the effective local treatment of bucco-pharyngeal infections.

In tubes of 20 Lozenges

PENICILLIN LOZENGES A & H

ALLEN & HANBURYS LTD · LONDON · E · 2
TELEPHONE: BISHOPSGATE 3201 (12 LINES). TELEGRAMS: GREENBURYS, BETH, LONDON

THE LANCET

LONDON: SATURDAY, DEC. 21, 1946

Risk or Opportunity?

THE profession has given the negative answer. Why? Firstly, because the leaders of the British Medical Association have presented a partial picture of the National Health Service scheme, continually mphasising its risks and imperfections rather than its opportunities. Secondly, because practitioners are ndignant at the Minister's handling of the dispute over insurance capitation fees. Thirdly, because t was widely, if erroneously, felt that proper consultations had never been held. Fourthly, because Mr. *BEVAN would not renounce the basic salary*, hough this was not essential to his project. Fifthly, because Willesden provided a gratuitous example of political interference in medical work Sixthly, because restrictions, controls, and loss of privileges have bred in the middle classes a mood of irritation n which they gladly canalise their grievances through the answer No. Lastly, because the Act gives the Minister power to create a bad service (Not a conclusive *reason, perhaps, for* refusing to help him to create a good one.)

When the B.M.A. council met last week its more experienced members must have known that the majority—then thought to be 56–44% but now nearer 54–46—does not justify non-cooperation with the Government of the day. They must have known how resistance at this stage would strike the public, which is tired of sectional bodies that prefer direct action to negotiation On the other hand, if they decided to continue negotiations they would have the unenviable task of explaining to their constituents why the majority vote was being ignored If the necessity for a two-thirds or three-quarters majority had been explained before the plebiscite, the rupture of negotiations could have been averted As it was, a situation has been allowed to develop in which the B.M.A. finds itself standing bravely, on untenable ground, with little over half its forces mustered.

The council's decision has yet to be ratified by the special representative meeting called for the end of January. But the representative body of the association is representative only in the sense that it represents the majority in each division,[1] and, since the distribution of Yes and No is fairly even throughout the country, the large minority will as usual have few spokesmen. We may *take it therefore that the* B.M.A. has now effectively dissociated itself from the shaping of the National Health Service at its present most critical stage, and that it will discourage doctors from advising the Minister or accepting any kind of appointment such as membership of a regional board. But though the association held 16 out of the 32 places on the Negotiating Committee, there are a number of other constituent bodies which may have different opinions about the proper attitude of the profession at this moment For example, judging by their attitude so far—which seemed to find no expression in the committee's report sent out with the voting papers—the governing bodies of the English colleges are unlikely to refuse counsel to the Minister on matters within their own sphere. Where he is deprived of the help of official bodies, Mr. BEVAN can turn to unofficial advisers—who will at least have the merit of wanting the Act to succeed—or can evolve regulations within his own office. The one action he cannot possibly be expected to take is to introduce an amending Bill as prescribed by Dr. DAIN.[2]

Though the Minister cannot go back to Parliament *and ask it to reverse major legislative decisions*, he could conceivably compromise with the B.M.A. by *altering the time-table of his scheme. This is the* proposal lately made by Sir HENRY BASHFORD,[3] who suggested that the Government should go ahead with their plans for hospital and specialist services but should leave general practice as it is. In so doing they would be following advice given to their predecessors by Lord DAWSON and others who wanted progress by stages: moreover, any good compromise has charms for men of good will, especially *at the present season.* But the Government's programme of social reform has now gone so far that only the united *opposition of the profession could* enforce such a capitulation. The Bashford plan would do nothing to remove the economic barrier preventing housewives and children from seeking early aid from their doctor; indeed by providing a free hospital service it might lead patients to short-circuit general practitioners whenever they could. It would do *nothing to* distribute doctors better, to equip them better, and to encourage their coöperation with each other or with *public-health workers*, or to employ demobilised doctors satisfactorily. Nor would it provide machinery through which the new benefits of the National Insurance Act and the National Health Service Act could be satisfactorily administered. The compromise, in fact, will not serve.

The Minister announces that the full scheme for a comprehensive medical service goes forward. It remains for him to persuade us that it will preserve those things we *rightly* value: *but* in confining its present rôle to destructive criticism the principal medical organisation has made a mistake; and unless the representative body reverses this decision the profession will be split. Even so, however, there need be no more than a sober agreement to differ for the time being. When the scheme is complete enough for judgment there will be a chance for united participation, or united opposition, based on facts rather than emotion; *and in either* case the profession could regain its effective unity. Meanwhile, with so close a division of opinion on policy, the *majority* will be wise to refrain from accusations of disloyalty against colleagues who mostly have the same causes at heart. Everyone who understands this conflict will recognise that honest and intelligent people can hold opposite views about it. To some it is natural to emphasise risks, to others opportunity. For our own part we see in the new service a *chance* of realising great aims. All forms of organisation are alarming and may be dangerous to freedom; but those who concentrate on the dangers of standardisation and regulation forget the strength of the English genius for liberty, inequality, and multiformity. They forget, too, the inherent strength of our own calling.

---

[1] See *Lancet*, 1944, ii, 84.

[2] *Brit. med. J.* Nov. 16, p. 747.

[3] *Times*, Nov. 19, p. 5.

In face of opportunity a provisional Yes is better than a final No. We need "the faith of the sail, not of the anchor."

Postoperative Chests

THE chest complications of operations are an evergreen topic among surgeons and anæsthetists, and have been the cause of acrimonious discussions without number. It is now generally accepted, albeit grudgingly, that a postoperative chest complication is more likely to be due to the hand in the abdomen than to ether in the lungs. As Brock [1] says, "to imagine that the simple replacement of inhalation anæsthesia by local or spinal . . . will avoid such a complication shows a child-like faith born of inexperience or insufficient observation." Yet many anæsthetists and surgeons still believe that the particular routine they adopt in abdominal operations confers immunity to chest complications, despite the evidence drawn from painstaking observation and statistical analysis. Dripps and Deeming [2] now take up the battle-stained cudgels once more. They report that in one series of 250 abdominal operations the incidence of postoperative atelectasis was nearly three times as high (11%) after inhalation anæsthesia as after spinal (4·2%). "Since it has been conclusively proved by many investigations that the anæsthetic agent and technique are not major factors in postoperative morbidity," they remark, "it was evident that something was wrong." They were right: something was wrong. Investigation showed that the administration of these anæsthetics was left to nurse anæsthetists and junior interns, while the postoperative care of the patients from the point of view of "chests" was, to put it mildly, haphazard. In a second series of 990 upper abdominal operations the incidence of atelectasis after spinal anæsthesia remained virtually unchanged (5%), while that after inhalation anæsthesia had now fallen to 4·1%. In this second series, however, the anæsthesia and postoperative care were conducted by specialists.

During the last decade fashions have been sweeping anæsthesia, each purporting to be more "modern" than its predecessor. During each fashion wave the toast of the moment invariably possesses the virtue of conferring freedom from "chests." There is no little danger with this background that the once-scotched idea may again take root—that postoperative chests can be banished by curare, 'Pentothal,' local, spinal, or what have you. To believe that any one drug or method, even if labelled "modern," will by itself prevent a postoperative chest condition is to forget the knowledge and experience laboriously gathered by two generations of anæsthetists and surgeons. Two outstanding papers of recent years, for example, one statistical by King [3] and the other clinical by Brock,[1] convincingly show that the factors determining the onset of "chests" are mainly the site of operation, pre-existing respiratory infection, and sepsis, while close on their heels in the postoperative period comes immobility, whether the result of pain, morphine, or instructions from nurses and doctors. Wh active search for means of preventing "chests is not to be deprecated, too little attention is st paid to the treatment which is so important in t first day or two after operation if extensive atelectas is to be avoided. "Freedom of the bed" is t right of every patient who has had an operatio notwithstanding a possible reluctance of the nursi staff to give up the old-established back-rest a their aversion to the natural resting position—t horizontal.

Perhaps we could well dispense with a litt modernity in the anæsthetic room in exchange for little more in the ward. Let us have fewer respir tory depressions, apnœas, inflations, resuscitati injections, and even a little less of that hatred ether which is coupled with a love of anything els Let us encourage the patient to move about in be and to cough, and impress on nurses the presen day concepts of atelectasis. Lastly, let us aim a uniform accuracy in reporting pulmonary as we as other operative complications, whether in writin or discussion, so that new anæsthetic agents an methods can be properly assessed, at any rate wit regard to their effects on the chest, for the sake of thos who depend for guidance on the words of the elect.

Cineplastic and Krukenberg Amputations

THE unused muscle bellies in amputation stumps arm and forearm have long challenged the ingenuit of surgeons; nor has the design of upper-limb prosthese yet advanced far enough to discourage attempts t utilise the power buried in these stumps. Of th mechanical hands that have been devised and adopte in this country and in the United States, those Simpson and Hobbs, and the Norden hand whic contains a free-wheeling device and may be describe as a prosthesis within a prosthesis,[1] all give a grip an a greater range of function than is possible with an single adjustable appliance, but their mechanica function is limited, and they are cosmetically crude The appearance of upper-limb prostheses has no received the attention it deserves. From this point o view the acrylic hand constructed at the Walter Reed Hospital and the 'Vultex' hand described by Clarke,[2] of Baltimore, are probably the best. The magnitude of the problem can be judged from the number of casualties submitted to amputation. As a legacy of the late war, some 15,000 British Servicemen have amputation stumps, about a quarter of these being upper-limb amputations and a little over 5% double amputations, whereas in the first world war there were over 40,000 British soldiers with amputations. This difference roughly corresponds to the ratio between the total casualties in the two wars.

Up to the end of 1945 the Allied medical services had made little use of cineplastic amputations. Few, if any, were done in Britain, but Rank and Henderson [3] practised the method successfully in Australia, and the operation had been done several times at the United States Navy hospitals at Mare Island and Philadelphia. The earliest attempts to harness the

---

1. Brock, R. C. *Guy's Hosp. Rep.* 1936, 86, 191.
2. Dripps, R. D., Deeming, M. van N. *Ann. Surg.* 1946, 124, 94.
3. King, D. S. *Surg. Gynec. Obstet.* 1933, 56, 43.

---

1. Bunnell, S. Quoted in War Office Report on U.S. Plastic Centres, by Major Patrick Clarkson, March, 1946.
2. Clarke, C. D. Facial and Body Prosthesis, St. Louis, 1945.
3. Rank, B. K., Henderson, G. D. *Surg. Gynec. Obstet.* 1946, 83, 373.

muscle power of amputation stumps, by passing skin-lined tubes through them, were made in Italy, but the cineplastic operation owes its full development to Prof. Ferdinand Sauerbruch, who introduced the use of big, well-buried skin-tubes of local tissue. Visitors to the Putti Institute at Bologna will remember the reversed abdominal tube pedicle which was made to provide the skin tunnel in forearm stumps. Since 1918 over 7000 cineplastic amputations have been performed at Sauerbruch's clinic at the Charité Krankenhaus in Berlin, and over 500 in the clinic of Prof. Max Lesche in Munich. Few aspects of German surgery have attracted more attention from Allied surgeons since VE-day, and both parties and individuals have paid many visits to Berlin and Munich to see this work. On another page Major Magee describes the cineplastic amputation as it is done in Berlin, where a local flap of skin, subcutaneous tissue, and deep fascia about 2 in. square is used to form the skin tunnel and the secondary defect is covered, not always completely, by a skin-graft. The operation is done under local anæsthesia. Professor Lesche's skin-flap is larger, perhaps 3 in. by $3^{1}/_{2}$ in.; the muscle tunnel is at least $1^{1}/_{4}$ in. in diameter and lies deep to three-quarters of the diameter of the muscle; the skin and fat tube is rotated through 90° before being passed through the muscle tunnel, so the suture line is proximal and away from the pressure of the peg; and the secondary defect is completely covered by a free graft. Observers have appreciated the advantages of attention to such details.

A properly made skin-tube buried in the forearm muscles or in the triceps should give an excursion of 1–2 cm. to a peg about 7 mm. in diameter lying transversely in the tunnel, and should be capable of exerting a power of 15–20 lb.; when buried in the biceps or in the pectoralis major the excursion of the peg should be 5 cm. or more and the power over 40 lb. This power is used to give grip to an artificial hand. Extension of the digits can be provided by a spring device in the prosthesis or by a skin tunnel through the extensor muscles which give voluntary movement—according to the choice of the surgeon. Cineplastic prostheses are fitted with blocking devices which allow the grip to be maintained without continuous muscular effort. The essential for success in the cineplastic method is prosthetic services of the highest order. Each of these cases is an individual problem, and successful function will depend largely on the skill and experience of the limb-maker. Surgery of this kind, except with close coöperation between surgeon and limb-maker, is useless. When properly made the cineplastic prosthesis has a fairly wide range of function—writing, use of cutlery or tools, and driving. This range is wider than that of any *single* appliance which can be fitted to a standard prosthesis. The advantage of the cineplastic amputation over the adjustable appliances is the great one of convenience; but most observers agree that neither the range nor the quality of function is as good as a well-trained patient can attain with the set of adjustable appliances in standard use in Britain.

In the Krukenberg forearm amputation, a pincers-like grip is provided by splitting the stump through the interosseous membrane between radius and ulna. The value of this amputation for African natives, who either could not obtain or would not use a modern prosthesis, was emphasised by Purce [4] and Squires.[5] Such circumstances remain one of the chief indications for the amputation, but German experience suggests that there are others. At operation, the cleft between radius and ulna is usually deepened to 12 cm., or at least a third of the length of the stump, and is so cut that there is local skin to cover either the ulna or the radius; as a rule, cover for the denuded side is provided by a free graft, but Professor Herlyn at Göttingen uses a belly-arm flap and incorporates an excess of abdominal skin at the depth of the cleft to ensure that there is a fold of flap here, not a suture line. In cutting the cleft, care is taken to preserve the pronator teres, since it is the action of pronation which approximates the two limbs of the pincers. In the cases observed at Göttingen by Fettes[6] these pincers gave a definite function to the limb, independent of prosthesis. Thus the patients could control a fork, perform their personal toilet, and use certain tools. None of the patients was concerned about the appearance of the lobster-claw-like stump. If necessary an ordinary upper-limb prosthesis can be fitted to the stump on occasion. The value of the Krukenberg amputation is limited, but it seems to be worth considering for men who have lost both upper limbs, and particularly for those who are also blind. It is these blind men who have lost both hands who make the greatest demands on surgical and medical ingenuity if their life is to be tolerable. For them a Krukenberg amputation, at least on one side, is worth considering because it can make them independent of a prosthesis and able to perform their own toilet.

In contrast to the end of the first world war, there has this time been remarkably little in any field of surgery for us to learn from Germany. Some aspects of amputation practice are possibly the sole exception. If the cineplastic and Krukenberg amputations developed by the German surgeons are to be given a trial here, it would be helpful if the limb-makers, and indeed some of the patients who have developed the maximum use of their stumps from clinics such as Lesche's or Sauerbruch's, would visit this country to give us the benefit of their experience.

A B C of the Act

The sections of the National Health Service Act to which its opponents object must by now be familiar to everyone. The able and persevering presentation of these objections has perhaps deflected some from studying the measure as a whole. For these and for others who would like to know more about the new service Mr. David Le Vay has written an account [1] which explains how it will affect citizen, patient, doctor, health worker, hospital, and local authority. Success, he says, will depend on two related factors—freedom from bureaucratic control and whole-hearted coöperation by the profession. The author emerges as a somewhat uncritical advocate of the service, but he has not allowed personal opinion to divert him from his principal aim, which is to explain its terms.

---

[4] Purce, T. *Brit. J. Surg.* 1939, 27, 419; 1946, 83, 373.
[5] Squires, B. T. *Ibid*, 1937, 25, 464.
[6] Fettes, D. War Office Report, Nov. 27, 1945.

[1] Your Guide to the National Health Service. By A. David Le Vay, M.S., F.R.C.S. London: Hamish Hamilton. Pp. 78. 3*s*. 6*d*.

Annotations

CHRISTMAS IN THE MEDICAL FAMILY

DAILY bread is a fine thing, but much improved by butter; and if this year we must spread the butter rather thin it should help us to remember that in many countries today, and even in some homes in England, it is spread even thinner. The Royal Medical Benevolent Fund has a special concern with the butterless bread of one group of people at Christmas. Sir Arnold Lawson's letter[1] will have recalled to readers that the Fund tries to give a substantial Christmas present to medical men or their families who find themselves in need, and that last year it was possible to give a cheque of £4 to each recipient. He asks that this year the profession will make the same gift possible by sending the Fund £2000. Last year his appeal was exceeded by more than £100, and this year, they tell us, we all have more to spend and less to spend it on. Most doctors will gladly do a kindness if reminded. This is the reminder.

PARÆSTHESIÆ IN THE LEGS

PERVERTED sensations in the limbs—numbness, tingling, prickings, burnings, and so on—are a common symptom, and their causation in the hand has been clarified by the differentiation of the syndromes of costoclavicular compression and of lateral prolapse of cervical intervertebral disks. Similar symptoms in the legs and feet may be the manifestations of organic neurological diseases such as peripheral neuritis and subacute combined degeneration of the cord, or of deficiency of some factor of the vitamin-B complex, a condition often seen among prisoners-of-war and internees in the Far East[1]; but there are cases where the cause remains obscure. Ekhom[2] in Scandinavia, Allison[3] in Canada, and Martin[4] in London have drawn attention to paræsthesiæ in the feet and legs ("restless legs," or "leg jitters") which wake the sufferers at night and may keep recurring for years without signs of organic neurological or vascular disease developing.

Now Schepers[5] in Johannesburg has approached the problem afresh by studying 100 patients in an institution for chronic diseases who suffered from paræsthesiæ in the legs, and excluding cases of frank organic neurological disease or manifest psychoneurosis. There were five main groups among these cases. The largest group (47%) were suffering from organic diseases of the lower abdominal viscera—ureteritis associated with prostatitis or cervicitis, salpingo-oöphoritis, or chronic colitis. *In these patients there were areas of hyperæsthesia on* the thighs, lower part of the legs, and feet, the distribution to some extent depending on the abdominal condition. The explanation offered for the sensory disorder in these cases is either spread of inflammation to the lumbosacral plexus or involvement of the autonomic nerves and retrograde reflex irritation of spinal cord segments. The second main group (28%) were cases of macrocytic hyperchromic anæmia in which there was either impaired superficial sensation in the distal parts of the legs, thought to be due to degeneration of the termination of the peripheral nerves, or spread of the sensory impairment up the back of the thigh and buttock in the distribution of the sacral dermatomes. In this group Schepers suggests that ischæmia of the spinal cord plays a part in causation, and the paræsthesiæ always disappeared when the anæmia was corrected; it seems possible that they were early cases of subacute combined degeneration. In two groups, one associated with gravitational œdema (9%), often only slight, and the other with peripheral vascular spasm (4%), ischæmia of the nerve-endings was thought to the cause. Finally there were 12 cases of "maske hypothyroidism, in which scattered patches of hyp and hypo-æsthesia on the legs disappeared with adequ substitution therapy. Here the terminal parts of peripheral nerves were thought to be constricted they pierced the deep fascia, either because of increas turgidity in the nerves or because the fascia beca "fluid-logged" and rigid as a result of the endocri defect.

O AND ANTI-O

THE groups of human red blood cells are determin by the presence or absence of two specific antige A and B. Thus the four main blood-groups are A A, B, and O (i.e., zero, neither A nor B). Von Dunge and Hirszfeld[1] postulated that the inheritance of t A and B factors depended on two independent pairs allelic genes, A and a (not A) and B and b (not B But Bernstein[2] demonstrated mathematically that th view was not supported by statistical data, which di however, fit in with a theory assuming three allel genes—A, B, and O (or R), where A and B are domina over O. This theory has now been generally accepte It differs from that of von Dungern and Hirszfeld supposing that group O is determined by a positi antigen. The discovery of sera which will react wi group-O red cells has lent additional weight to Ber stein's hypothesis.

Twenty years ago Landsteiner and Levine[3] foun irregular iso-agglutinins in some rare human sera groups A_1B and A_1, which, though weak and acti only in the cold, would agglutinate red cells of grou A_2 and O. Since then more potent iso-sera have be *described in two persons of group* A_1[4, 5] *and two of* A_1B. In three of these four cases iso-immunisation by tran fusion or pregnancy may have increased the activi of the atypical iso-agglutinin, so that it became acti against the appropriate cells at body temperatu The serum of the latest example with *group* A_1 described this year by Henry, agglutinated not on O and A_2 red cells but also, though less strongly, son red cells of groups A_1, B, and A_2B.

Schiff[8] showed in 1927 that cattle sera sometim contained an agglutinin which would agglutinate huma group-O red cells. Eisler,[9] by immunisation wi Shiga bacilli, produced in goats an antibody which al would agglutinate group-O red cells. Both the natur ox sera and the immune goat sera agglutinate all huma red cells, but those of groups O and A_2 much more strongl than those of groups A_1, B, and A_1B. Furthermore, eve as some individuals of groups A and B secrete in the body fluids—notably the saliva and gastric juice—substances which have great A and B activity as measure by inhibition of anti-A and anti-B sera, so some individuals of group O secrete a substance capable c inhibiting anti-O sera.[10] Morgan and van Heyningen have noted that an even better source than saliva c A, B, and O active substances is the material fro pseudomucinous ovarian cysts. However, where "secretors" of A and B substances usually secrete i their saliva not only A or B but also O active *substanc* cyst fluid from A and B persons has not, except in on

---

[1] *Lancet*, Oct. 12, p. 545. The Fund's address is 1, Balliol House, Manor Fields, London, S.W.15.

---

[1] Cruickshank, E. K. *Lancet*, Sept. 14, p. 369.
[2] Ekhom, K. A. *Acta. med. scand.* 1945, suppl. 158.
[3] Allison, F. G. *Canad. med. Ass. J.* 1943, 48, 36.
[4] Martin, J. P. *Brit. med. J.* 1946, i, 307.
[5] Schepers, G. W. H. *S. Afr. med. J.* 1946, 20, 437.

---

[1] von Dungern, E., Hirszfeld, L. *Z. ImmunForsch.* 1910, 6, 28
[2] Bernstein, F. *Klin. Wschr.* 1924, 3, 1495.
[3] Landsteiner, K., Levine, P. *J. Immunol.* 1926, 12, 441; *Ibi* 1929, 17, 1.
[4] Morzycki, J. *Z. ImmunForsch.* 1935, 84, 80.
[5] Davidsohn, I. *J. Amer. med. Ass.* 1942, 120, 1288.
[6] Wiener, A. S., Oremland, B. H., Hyman, M. A., Samwick, A. A *Amer. J. clin. Path.* 1942, 11, 102.
[7] Henry, N. R. *Med. J. Aust.* 1946, i, 395.
[8] Schiff, F. *Klin. Wschr.* 1927, 6, 303.
[9] Eisler, M. *Z. ImmunForsch.* 1930, 67, 38.
[10] Schiff, F., Sasaki, H. *Klin. Wschr.* 1932, 11, 1426.
[11] Morgan, W. T. J., van Heyningen, R. *Brit. J. exp. Path* 1944, 25, 5.

instance, shown significant O activity. Morgan and Waddell,[12] using purified O active material from ovarian cysts, have immunised rabbits and obtained a serum with anti-O activity stronger than the natural anti-O serum obtained by selection from over 100 cattle sera. The titres against A_2 and O red cells of both this immune serum and of good ox serum were high; some B red cells reacted as strongly as A_2 red cells, and the reaction of A_1 red cells varied.

On the Bernstein theory, it might be expected that all heterozygous A and B red cells (i.e., AO and BO) would be agglutinated by powerful anti-O sera; but Hirszfeld and Amzel,[13] using a powerful immune goat serum as anti-O, could find no evidence of this. And Moureau[14] has reported a family AB x AB with 10 children—4 with AA, 2 with BB, and 4 with AB—in all of whom the red cells reacted with anti-O serum. Hirszfeld and Amzel regard the receptor O as almost ubiquitous in the human species and therefore almost a species factor (cf. Witebski and Okabe[15]). Matta[16] has rejected the theory that anti-O is a species antibody, since some AB, A, and B cells cannot completely absorb from a powerful anti-O serum all its anti-O activity, and anti-human sera do not agglutinate O cells more strongly than red cells of other groups. Wiener and Karowe[17] appear to accept the theory that anti-O is a species antibody, and attempt to explain diagrammatically why this serum reacts with O cells and heterozygous A_1, A_2, and B cells; but they do not explain its reactions with A_1A_1 and A_1B cells, which were found to be positive by Wiener.[18] Wiener explains this by comparing anti-O to anti-Hr′ (anti-c), and the O and A_2 agglutinogens to Hr′ antigens (c), which appear in the rh and Rh″, Rh_0, and Rh_2 genes of the Rh series—in other words, the genes contain a common antigen. The apparent presence of O antigen in Shiga bacilli, hog-gastric mucin, and probably other animal tissues excludes the possibility of its being a species-specific antigen. The bulk of evidence goes to show that it is almost universally present in human tissues but that it varies in quantity. It could be argued that it is a heterophile antigen. Eisler has shown that it is not the Foresman antigen, but it may be of similar type, originally universally present and still practically ubiquitous in human red cells, as described by Hirszfeld and Amzel. These workers describe a descending degree of reaction with anti-O serum, from O to A_5 to A_4 to A_3 to A_2 and to four grades of A_1 (A_m, A_r, A_j, and A_c), and a similar descending degree from O to B_2, B_m, B_r, and B_j: they postulate the presence of B_5, B_4, and B_3 at one end of the scale and B_c at the other. They suppose that in each case, by mutation through these stages, O is converted to A or B; thus, they argue, there is only a quantitative difference between the subgroups of A. Wiener[19] and Boorman et al.,[20] however, claim to have shown that there is a qualitative difference at least between A_2 and A_1, in that persons of group A_2 can have an anti-A_1 iso-agglutinin in the serum, capable of agglutinating in vitro and hæmolysing in vivo red cells of subgroup A_1.

It is possible to fit all the facts into a hypothesis which assumes that the O is a fundamental antigen, that the common A is a separate antigen, and that the A_1 antigen develops by mutation from O. Thus all A_2 and O cells would react strongly with anti-O, and A_1 red cells would react according to the degree of mutation of O to A_1. When mutation was complete, anti-O could appear in the serum of such a blood without infringing Landsteiner's law. A similar postulate would be needed for group B, although as yet no qualitative difference between human B antigens has been proved. Whatever the hypothesis favoured, there is sufficient evidence that the O antigen detected with these many anti-O sera differs from that of Bernstein's hypothesis. This does not disprove that hypothesis; it does, however, necessitate a revision of terminology, unless we revert to the use of R as the third antigen to A and B in Bernstein's hypothesis; but this might lead to confusion since the Rh antigen is sometimes known as R. Before new theories and terminologies are accepted it must be established that all these various anti-O sera have the same specificity.

MORE EXCITING GIVING

THE first proposals for the nationalisation of the hospitals under the new Act seemed to many to endanger much that was of value in the voluntary system. But the chairman at the annual meeting of King Edward's Hospital Fund for London last week, Lord Catto, said that the concessions made by the Minister in the process of transmuting the Bill into an Act have gone a long way to allay misgivings. Indeed he suggested that for the first time in the history of the hospitals it has become possible to give "without the mental reservation that the gift may be swallowed up in routine expenses."

The changes about to take place in the organisation of medicine will give scope to courageous pioneers, and the King's Fund are determined to make the most of their opportunities. Their influence is widening, for the abolition of the distinction between voluntary and municipal hospitals will allow them for the first time to help all the hospitals of London. Among the things on which the Fund propose to continue to spend money, Lord Catto mentioned the improvement of hospital catering, the recruitment of nurses and the provision of preliminary training schools for them, and the provision of special equipment and amenities. The Fund are also interesting themselves in accommodation for convalescents, and have lately appointed a committee which, with the Institute of Hospital Almoners, is surveying the needs and possibilities of these homes.

In proposing the vote of thanks to the chairman, Sir Herbert Eason, F.R.C.S., pointed out that the Fund during its existence had adapted itself to the varying needs of the voluntary hospitals, and he was confident that it would also adapt itself to the needs of the future.

TUBERCULOSIS IN NEWFOUNDLAND

IN July, 1945, the Newfoundland government invited Dr. T. O. Garland and Dr. D'Arcy Hart to investigate tuberculosis on the island. Their report[1] shows a serious state of affairs. About half the population of 320,000 live on the Avalon peninsula (including St. John's, the capital city of 50,000), while the rest live in tiny scattered settlements on the very long coastline. Radiographic surveys of samples indicate an average of about 3·5% of active cases of tuberculosis (adding previously known active cases to those newly discovered), but great variations were found in different places, suggesting local pockets or epidemics. Although the tuberculosis death-rate decreased from 236 per 100,000 in 1926 to 143 in 1943, it is still nearly three times that of Canada or Great Britain; in fact, Newfoundland is now where England and Wales were in 1910. The rate of decline in recent years has been approximately the same in the three countries, with the significant exception that in Newfoundland it started rising in 1932 and reached a peak in 1937, this rise coinciding with the years of severe economic depression. More women than men die of tuberculosis, which may be partly explained by their very hard life; besides housework, and perhaps minding the garden, they help with fishing, preparing baits, and mending nets.

---

[12] Morgan, W. T. J., Waddell, M. B. R. *Ibid*. 1945, 26, 387.
[13] Hirszfeld, L., Amzel, R. *Ann. Inst. Pasteur*, 1940, 65, 251, 386.
[14] Moureau, P. *Sang*. 1935, 9, 484.
[15] Witebski, E., Okabe, K. *Klin. Wschr*. 1927, 6, 1095.
[16] Matta, D. Egyptian University, Faculty of Medicine, Publication no. 11, 1937.
[17] Wiener, A. S., Karowe, H. E. *J. Immunol*. 1944, 49, 51.
[18] Wiener, A. S. *Science*, 1944, 100, 595.
[19] Wiener, A. S. *J. Immunol*. 1941, 41, 181.
[20] Boorman, K. E., Dodd, B. E., Loutit, J. F., Mollison, P. L. *Brit. med. J*. 1946, i, 751.

[1] Tuberculosis in Newfoundland. Department of Public Health and Welfare, St. John's, Newfoundland. 1946. Pp. 58.

The diet of many of the islanders is glaringly deficient in fresh fruit and vegetables, and in milk,[2] and could be improved by such means as home preparation of vitamin C from local berries, and by keeping goats for milk (cows are a rarity, and bovine tuberculosis does not play an important part). Houses are bad only in St. John's, but the general standard of living is low: in 1937 a third of the population was on relief and the allowances are wholly inadequate, sometimes "forcing a tuberculous household into the most abject poverty." It is suggested that special allowances be made to tuberculous patients and their families, and that industries should be obliged to take a proportion of those recovering from the disease. There is at present only one sanatorium for the whole island, and hospitals and dispensaries are needed. Training will be required for the doctors and nurses staffing these institutions, and Dr. Garland and Dr. Hart want to see more mass radiography, using the miniature film, and tuberculin-testing of children to act as a pointer to open cases.

LOUSE-BORNE TYPHUS

Complication and simplification seem to alternate in the classification of the typhus group of fevers. This statement applies equally to tick-borne, mite-borne, and louse-borne typhus.[1] Up to about forty years ago only one form of louse-borne typhus was recognised—that now called epidemic exanthematous typhus, caused by *Rickettsia prowazeki*, and conveyed by *Pediculus humanus*—but about that time Wolhynian fever, caused by *R. wolhynica*, was described as a specific entity in Poland. In the war of 1914–18 a third entity, trench fever or five-day fever, was recognised and attributed to *R. quintana*. In the interval between that war and 1939 very little was heard of trench fever; but a fourth form of louse-borne typhus, in laboratory workers, was described by Mosing,[2] who named the causal organism *R. weigli*. Weigl's prophylactic vaccine against typhus exanthematicus is prepared by injecting suspensions of *R. prowazeki* into lice per rectum and after an interval removing their intestines and grinding them up in formol-saline. For this method very large numbers of lice are needed and these have to be fed on laboratory workers; it was these workers who contracted the disease. A few years later, however, it was considered that *R. quintana* and *R. wolhynica*, the causal organisms of trench fever and wolhynian fever respectively, were identical, and that *R. weigli* was probably the same organism.

An outbreak similar to that described by Mosing took place at Addis Ababa in 1941–42, soon after the occupation by British troops. It involved seven laboratory workers engaged in feeding lice for Weigl's method of making prophylactic vaccine, and is described by Codeleoncini,[3] who details the isolation of a rickettsia from such cases, the laboratory findings, and experimental work on guineapigs and monkeys (*Papio doguerœ*), all of which convince him that trench fever, the disease described by Mosing, and the Ethiopian disease are identical and due to one and the same rickettsia, which is the common louse rickettsia, *R. pediculi*. Codeleoncini further suggests that the disease develops only when enormous numbers of lice are present—e.g., in trench warfare and in laboratory feeding of lice for making Weigl's vaccine—and that probably an endemic focus in Russia acts as a reservoir between outbreaks.

CAUSE OF NUTRITIONAL ŒDEMA

Nutritional œdema is usually thought to be d to hypoproteinæmia, especially a deficiency of serum-albumin, which normally maintains the osmotic pressure of the plasma, thus preventing the escape of fluid from the blood-stream. This view was put forward in 18 by Starling, who did not, however, postulate that hypoproteinæmia was the sole cause of the œdema Bayliss later showed that a second factor was a high venous pressure. When the hydrostatic pressure the venous capillaries is raised fluid filters from plasma through the vessel walls to swell the intercellu fluid of the tissues—e.g., in the œdema of chronic heart-failure.

There is yet a third possible cause of nutritiona œdema. Peters[1] has emphasised the importance of th cell membrane as a physiological boundary separa the cells and intracellular fluid from the intercellu fluid. Consequently it is imaginable that œdema c also be produced by leakage from intracellular to inter cellular fluid. This supposition is supported by Bachet, who found that 17 cases of early œdema among 120 of nutritional œdema had a normal serum-albumin level and estimations of serum-albumin in non-œdematou patients who subsequently developed œdema showed no hypoproteinæmia anticipating the œdema. Further, he found that signs of heart-failure were rare in the early stages of nutritional œdema. These findings militate against the theories that nutritional œdema is caused, in the first instance, by hypoproteinæmia or by high venous pressure though both of these mechanisms come into play in the later stages and increase the existing œdema. Bachet therefore argues that nutritional œdema starts in the cells, and that it is only later that the serum-albumin level falls—in other words, that nutritional œdema is due to an insufficiency of proteins in the diet, leading to a deficiency of albumin in the tissues. On the other hand, the occurrence of œdema with a normal serum-protein may be due to some factor which interferes with the function of the vascular endothelium—vitamin deficiencies, for example—rather than to actual protein lack within the cells. For the present the verdict on Bachet's hypothesis must be "not proven."

Lamy and his co-workers,[3] in a study of 38 prisoners-of-war, have confirmed the lack of correlation between serum-protein levels and œdema and have carried the investigation a step further. They measured the serum-protein levels and the osmotic pressure of the serum in 8 prisoners-of-war suffering from malnutrition, 2 with no œdema, 2 with slight malleolar œdema, and 4 with severe œdema, and found that a lowering of the osmotic pressure of the serum was clearly correlated with an increase in œdema, though the serum-protein level was normal in all cases. They conclude that the serum of the patients with œdema contains an abnormal protein of low osmotic pressure, and that this protein is derived from muscle. They do not, however, believe that the low osmotic pressure alone is responsible for the onset of œdema in malnutrition, and support the view that the main factor is an increased permeability of the capillary walls.

Sir William Collins, K.C.V.O., F.R.C.S., who died on Dec. 11 at the age of 87, will be remembered as the creator of the London Ambulance Service. As chairman of the London County Council, as Member of Parliament, and as ophthalmic surgeon to several London hospitals, he served medicine both inside and outside his profession. He was also British plenipotentiary at conferences on the control of dangerous drugs.

---

[2] See *Lancet*, 1945, i, 760.

[1] See *Lancet*, Oct. 12, p. 531.

[2] Mosing, H. *Med. dośw. spol.* 1936, 21, 218 (abstr. in *Arch. Inst. Pasteur, Tunis*, 1936, 25, 373).

[3] Codeleoncini, E. *Boll. Soc. ital. Med. Igiene trop.* (sez. *Eritrea*), 1946, 6, 129.

[1] Peters, J. P. Body Water. London, 1935 (see also *Lancet* 1940, i, 704).

[2] Bachet, M. Étude des troubles causés par la dénutrition dans un asile d'aliénés, Paris, 1943, and *Bull. méd.* 1946, 59, 1.

[3] Lamy, M., Lamotte, M., Lamotte-Barillon. *Pr. méd.* Dec. 7, 1946, p. 814.

Special Articles

RESPONSIBILITY FOR THE "CHRONIC" SICK

THE HISTORICAL PERSPECTIVE

A. G. L. IVES
M.V.O., M.A. Oxfd

ONE sometimes hears it said that the voluntary hospitals have failed in their duty to the incurable or chronic case, and the inference is drawn that one of the achievements of the National Health Service Act will be to return them to their original wider purposes by bringing all the sick—acute and chronic alike—under a single administration. Since we are on the eve of one of the greatest changes in hospital history in this country, it may be of interest, and possibly of some value in adjustment of perspective, to inquire to what extent this is true. In part at least it represents a modification of the facts of history to suit our present outlook.

FUNCTION OF HOSPITALS

Let us attempt a very brief résumé of the past history of the function of the hospitals. The story falls into three main phases.

The hospitals of pre-Reformation days, of which St. Bartholomew's and St. Thomas's are our only two remaining examples, certainly accepted a very wide interpretation of their duty, in common with most other medieval hospitals. The earliest hospital appeal of which we have record is that which followed the fire that destroyed St. Thomas's in 1215. "Behold at Southwark an ancient hospital built of old to entertain the poor. . . ." "To entertain the poor"—the phrase reflects admirably the wide scope of the word "hospital"—it extended even to the destitute.

After the dissolution of the monasteries and the refoundation in the 16th century of St. Bartholomew's and St. Thomas's this conception was in practice modified though not abandoned. The citizens of London made a careful census of those for whom they wished to provide, as follows: fatherless children 300; children overburdening their parents 350; sick and lame persons 200; aged and infirm 400; poor householders 600; idle vagabonds 200. Christ's Hospital was to take care of the children, while Bridewell took charge of the idle, and Bedlam the insane. St. Bartholomew's and St. Thomas's between them cared for the remainder, curable and incurable alike. The churches, streets, and lanes were daily filled with "sick and infirm poor men lying begging." It was the fact that the refounded St. Bartholomew's could not receive a tenth of them that inspired Bishop Ridley to urge upon Edward VI the propriety of refounding "the late hospital of Thomas Becket in Southwark." In the refounded St. Thomas's there was for many years a "night lodgers' ward" into which the hospitaller admitted such cases as he deemed deserving. The poor were put to "such convenient occupations as they are most apt unto." But in the century and a half between 1552 and 1700 the two hospitals carried between them the whole burden of caring for the sick of London, and the pressure upon their resources was such that the incurable had to give way to the curable. The abstract of orders for St. Thomas's for the year 1700 *specifically records* "*No incurables are to be received.*"

A few years later Thomas Guy recognised the need for provision for those excluded from the two royal hospitals, but he had doubts about the practicability of his purpose. The wording is illuminating, and discloses very plainly the nature of the dilemma: it explains and justifies the action of the royal hospitals. Within a few years of his death the governors republished the words of his will, and pointed out that people had generally understood by it such as "laboured under distempers, loss of limbs, blindness, and other natural and accidental infirmities, and even age itself." If taken in such a sense it would soon have become an almshouse; he had accordingly described the persons for whom his hospital was intended—"to be such as were capable of relief by Physick and Surgery." Guy's thus came into line with the other two hospitals.

The voluntary hospitals of the 18th century followed suit. The Westminster Hospital limited the stay to a month, and excluded incurables. The London Hospital was for "relieving the poor in case of sickness or accident." A similar view was taken at Edinburgh; though the records are not explicit, the implications are clear enough. And so with the others. It is a mistake to suppose that the voluntary hospitals of the 18th century were founded with a wide all-embracing purpose, and that their malign successors have gradually excluded the incurables. The object of the restriction was to prevent abuse of their facilities; otherwise they would have become almshouses rather than hospitals.

UNDER THE POOR-LAW

The provision of inpatient accommodation under the poor-law dates from 1723, when an Act was passed empowering parishes to unite in "unions" for the purpose of building workhouses. In them were usually provided quarters for inmates who fell sick, but the intention was that those who seriously required medical treatment should "if possible" be removed to a hospital. By 1864 the neglect in the workhouses had become a scandal, as the famous investigation by THE LANCET showed—"a mere similacrum of real hospital accommodation."

Three years later the Act of 1867 established the Metropolitan Asylums Board and made provision for poor-law infirmaries absolutely separate from the workhouse. Thirty years later conditions were still such as to earn the vigorous condemnation of Sir Henry Burdett, though the scale of the provision made had been vastly *increased*.

Legislation permitting, but not requiring, local authorities to provide general hospitals besides hospitals for infectious diseases under public-health powers goes back to the Public Health Act of 1878. But as late as 1929 Bradford was the only county borough which *exercised these* powers. Administrative convenience was all on the side of provision by way of the poor-law. The Act of 1929 confirmed the option, giving local authorities in terms the right, though not the duty, to provide hospital accommodation under public-health powers; but by the beginning of 1937 only 36 county *boroughs had* exercised their option, and many still today make this provision under public-assistance rather *than public-health* powers.

In 1928 Sir George Newman, in his annual report, spoke of the "clear direction" given that the process "known for the last twenty years as the break-up of the Poor Law should be put in hand in a practical manner." But the fact is that there is no formal obligation upon anyone to provide for the incurable unless they be also destitute and fall under the poor-law.

UNDER THE NATIONAL HEALTH SERVICE ACT

The new Act changes this; it becomes the responsibility of the Minister to provide "to such extent as he considers necessary to meet reasonable requirements . . . hospital accommodation." "Hospital" is defined as meaning an institution for the reception and treatment of persons suffering from illness, and "illness" in turn includes any injury or *disability* requiring medical treatment or nursing.

This brief survey of hospital history may serve to correct an impression which seems to be gaining ground that the voluntary hospitals have neglected their clear duty in regard to the "incurable" side of hospital work.

To substantiate the contention one has to go back many years before the foundation of the vast majority of the voluntary hospitals in the 18th and 19th centuries, and reinterpret the very word " hospital "—to give it, in fact, a medieval connotation. That is what the present Act really does; and it is all to the good. But to be fully in line with the early meaning of the word it would be necessary to go much further still, and to include within the ambit of the hospital services not only all suffering from illness that require medical or nursing care but also all the poor and necessitous. Maybe one day we shall, and the hospital will become once again a place " to entertain the poor," and care, rather than cure, become the accepted translation of *cura*.

YES OR NO ?

RESULTS OF B.M.A. PLEBISCITE

THE British Medical Association on Nov. 15 sent the following question to 56,671 members of the medical profession: " Do you desire the Negotiating Committee to enter into discussions with the Minister on the regulations authorised by the National Health Service Act ? "

By Monday last 38,872 replies had been received from civilians, of which 17,688 (45·5%) were Yes and 21,184 (54·5%) were No. Of the 34% of Service doctors whose replies had been received by Monday, 56% voted Yes and 44% No.

In view of the special difficulties attending the Service poll, Service voters will be given until Jan. 6 to record their votes. A final report on the plebiscite, embodying civilian and Service figures, will be made soon after that date. Meanwhile the accompanying tables give figures up till Dec. 16.

STATEMENT BY DR. DAIN

On Dec. 12, explaining the decision of the B.M.A. council, Dr. GUY DAIN, the chairman, said that " the medical profession has stated plainly through its Negotiating Committee that the National Health Service Act as passed is in conflict with the principles of the profession." Having received the results of the plebiscite, the council had had to consider whether there was a majority and, if so, whether this was sufficient to justify not entering into discussions with the Minister. Its answer to both questions was in the affirmative. It had decided to call a special meeting of the representative body of the association on Jan. 28 to consider the resu of the plebiscite and to approve the following resolutio

> " That the Negotiating Committee be advised th in view of the results of the plebiscite the Minister informed that because of the divergence between t principles of the profession and the provisions of t National Health Service Act, the committee is unal to enter into discussions with the Minister on t regulations to be made under that Act."

Examination of the results showed that of the docto mainly concerned—i.e., the general practitioners 64% had voted against negotiating. As was to expected, this situation was reversed in the case of m already in whole-time salaried appointments, though t large proportion of those actually in Government servi voting against negotiation was regarded as significa The poll of civilian doctors was just over 80%— extraordinary response comparing more than favourabl for example, with the poll at the last two Gener Elections. The Service poll was inevitably small, account of distance and difficulty of tracing units, on 32% replies being received at the time of speakin Examination of the analysis showed a consistent pictur " in the general practitioner group the young docto

2. SOME IMPORTANT PERCENTAGES

—	Total % voting	% voting " yes "	% voting " no "	% not voting	Of those who vote % voting " yes "	Of those who vote % vot " n
All civilian categories:						
Great Britain ..	81	37	44	19	46	5
England and Wales only	83	38	45	17	46	5
Groups 1 to 4 (Consultant or specialist, general practitioner principals and assistants, whole-time voluntary hospital):						
Great Britain ..	92	37	55	8	41	5
England and Wales only	93	38	55	7	41	5
Groups 2 and 3 only (General practitioner principals and assistants)						
Great Britain ..	88	32	56	12	36	6
England and Wales only	90	32	58	10	36	6

1. CIVILIAN PRACTITIONERS

Group	Description	England and Wales		Scotland		Ireland		Totals		Total replies received
		Yes	No	Yes	No	Yes	No	Yes	No	
1	Consultant or specialist	1905	2130	200	283	23	56	2128	2469	4597
2	General practitioner principal	4736	8835	585	970	148	198	5469	10,003	15,472
3	General practitioner assistant	814	1175	135	189	23	33	972	1397	2369
4	Whole-time voluntary hospital	1821	1335	248	239	41	36	2110	1610	3720
5	Whole-time local-authority general hospital	946	504	94	48	11	12	1051	564	1615
6	Whole-time local-authority special hospital	709	303	95	53	22	6	826	362	1188
7	Whole-time public-health service	1121	659	146	90	21	15	1288	764	2052
8	Whole-time Government service	436	216	85	38	11	4	532	258	790
9	Whole-time teacher	241	109	66	35	4	6	311	150	461
10	Whole-time research	190	65	23	11	1	3	214	79	293
11	Whole-time non-Government post	211	197	18	22	1	5	230	224	454
12	Medically qualified dental surgeon	65	160	13	36	—	2	78	198	276
13	Retired	1131	1753	139	240	15	23	1285	2016	3301
14	Unclassified	992	900	170	172	32	18	1194	1090	2284
	Totals	15,318	18,341	2017	2426	353	417	17,688	21,184	38,872

3. AGE-GROUPS (PERIOD SINCE QUALIFICATION)

Description	0–7 years				8–14 years				15–21 years				22 years and over				No age given			
	England and Wales		Scotland and Ireland		England and Wales		Scotland and Ireland		England and Wales		Scotland and Ireland		England and Wales		Scotland and Ireland		England and Wales		Scotland and Ireland	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Consultant or specialist	71	74	20	11	426	295	55	43	463	511	41	72	917	1218	100	209	28	32	7	4
General practitioner principal ..	327	528	67	112	813	1454	114	180	1192	2261	173	250	2327	4502	373	609	77	90	6	17
General practitioner assistant ..	428	634	103	141	231	314	28	48	75	95	12	10	71	120	12	18	9	12	3	5
Whole-time voluntary hospital ..	1319	1082	198	212	387	184	71	42	49	22	5	4	43	28	9	10	23	10	6	7
Whole-time L.A. general hospital ..	514	351	76	46	239	82	20	9	95	30	3	4	83	33	2	1	15	8	4	—
Whole-time L.A. special hospital ..	234	126	51	32	176	70	26	14	129	38	18	4	163	65	16	7	7	4	6	2
Whole-time public-health service ..	119	51	21	13	237	120	37	23	276	152	44	27	456	327	64	41	33	9	1	1
Whole-time Government service ..	90	37	26	15	94	29	21	9	73	31	14	4	170	116	30	13	9	3	5	1
Whole-time teacher	63	30	19	11	59	30	18	3	52	15	10	12	61	32	21	12	6	2	2	3
Whole-time research	90	25	12	11	48	11	6	1	16	3	2	1	32	25	3	1	4	1	1	—
Whole-time non-Government post ..	29	25	3	4	40	39	7	6	60	54	—	4	76	78	9	12	6	1	—	1
Medically qualified dental surgeon..	6	22	—	3	12	22	5	9	14	34	3	2	28	80	5	24	5	2	—	—
Retired	10	17	6	5	26	25	4	3	42	42	8	14	1027	1625	122	232	26	44	14	9
Unclassified	502	340	127	98	209	172	41	30	98	94	9	16	166	274	23	41	17	20	2	5
Totals	3802	3342	729	714	2997	2847	453	420	2634	3382	342	424	5620	8523	789	1230	265	247	57	55

effectively support the majority against negotiation. There is no question of age overweighting the decision."

"The B.M.A.," Dr. Dain continued, "is a democratic body and in the light of these figures the council has no mandate to negotiate. The position therefore is that the B.M.A. is not empowered to accept any invitation that may be given by the Minister to the medical profession to join him in discussing the regulations to be made under the National Health Service Act. He may have many offers of help, but none from the main body representing the profession.

"It is important to remember that the National Health Service Act is not a Conscription Act and that a decision not to join the service is not disloyalty to the country. Whatever the ultimate outcome the doctors will be loyal to their calling and to their patients to whom, as always, they owe their first duty."

In answer to questions from the press, Dr. Dain stated that in reaching its decision the council had been influenced by the high negative vote among general practitioners and their assistants. Whether the B.M.A.'s withdrawal would mean the end of the Act was for the Minister to decide. The Act could not be carried out with 55% of the profession withholding their services, and even if 100% were in favour they would not be able to work it in its present form. He saw no way out except an amending Act.

Dr. CHARLES HILL, secretary of the B.M.A., explained that the profession would go on doing its work: "there is no strike here; no question of pay or conditions of service arise." As quoted in the *Manchester Guardian* (Dec. 13) he added:

> "We believe in a comprehensive service available to all who need it; we believe in the merging of municipal and voluntary hospital services; we believe in the regionalisation of hospital services."

It would be necessary, he said, for the profession to make its proposals towards these ends.

THE MINISTER'S COMMENT

After the announcement of the result of the plebiscite the following statement was issued by the Ministry of Health:

> "The Minister has learnt that the B.M.A. are placing the results of the plebiscite before a special representative meeting with a recommendation that the profession should refuse to discuss with him the steps to be taken to bring the National Health Service Act into operation. He hopes that before any final decision is taken accepting this recommendation, wiser counsels will have prevailed; and he feels sure that the medical profession will take no steps which would make it difficult for them to take part in the comprehensive health service which the people of this country so ardently desire.
>
> "Meanwhile, the Minister has a clear duty to carry out the instructions of Parliament as expressed in the Act, and he can no longer postpone the consultations which are a necessary preliminary to the setting up of the administrative machinery. He is, therefore, proceeding to consult all the many other interests which will be concerned in the National Health Service. He is also considering what ought to be done—and this is a matter to which he attaches great importance—to give the medical profession the opportunity of assisting to shape, and of playing its part in, the new service."

TRADE-UNION MEMBERSHIP

THE following letter, signed by Dr. Charles Hill as secretary, is being sent by the British Medical Association to all local authorities:

> The Association has considered, with particular reference to medical officers in the local government service, the position arising from the repeal by the Trade Disputes and Trade Unions Act, 1946, of the Trade Disputes and Trade Unions Act, 1927, Section 6 of which made it illegal for any local or other public body to require as a condition of the employment of any person that he should or should not be a member of a trade union.
>
> Some local authorities have passed resolutions imposing on their employees a requirement of membership of a trade union or other organisation. In this connection I am instructed to inform you that the British Medical Association, which represents the great majority of doctors and enjoys a membership of over 54,000 and is the negotiating body for the medical profession, recognised as such by the Ministry of Health and the associations of local authorities, is opposed on principle to a practitioner being required to join any body, British Medical Association or other—this does not of course apply to membership of medical defence societies. The Association prefers that its membership should be voluntary, the strength of the Association remaining an expression of the profession's confidence in its representative body.

I should be glad to hear from you on this matter with regard to appointments under your Authority.

On Dec. 11 the council of the B.M.A. decided that—

> Where an authority imposes upon its officers or candidates for office a requirement of a membership of a particular body or bodies, B.M.A. or other (but excluding medical defence societies), the Association should protest to such authority, and afford financial help to any practitioner who suffers as a result of accepting the advice of the Association. All advertisements for whole-time public health medical officer appointments of such authorities, submitted by such authorities for publication in the *British Medical Journal*, shall be rejected and the profession advised not to make applications for such posts.

DEVELOPMENT OF NEUROSURGERY

REVIEW BY MR. CALVERT

WITH Prof. W. W. D. THOMSON in the chair, the annual address to medical students of the Royal Victoria Hospital, Belfast, at the opening of the winter session, was given by Mr. C. A. CALVERT, F.R.C.S.I., who spoke on the history and development of neurosurgery.

Though neurosurgery is one of the most youthful of the surgical specialties, surgery of the skull was, he said, one of the earliest crafts. In the Edwin Smith papyrus, of about the 16th century B.C., 27 cases of head injury are described, and the occurrence of deafness in fracture of the temporal bone is noted, together with the advice that in closed head injuries decompression should be performed at the point of contusion. Hippocrates emphasised that no head injury was to be considered trifling, since even a scalp wound might prove fatal. His classification of skull fractures was almost modern, and he advised the use of a trephine in certain cases and that, when the instrument becomes hot, it should be cooled from time to time, the greatest care being taken to avoid injury to the dura. His subsequent dressing, a preparation of either wine and honey or of tar, was virtually an antiseptic application.

Under the Romans surgical operations were carried out for many different conditions, and the surgeons were equipped with many well-constructed instruments. Some of Celsus's observations on head injuries included the serious prognostic significance of prolonged unconsciousness and bleeding from the nose and ears. Galen, unfortunately, said that surgery was to be regarded merely as a branch of medicine, and this was interpreted by the Arabs (to whom is due the credit for preserving many of the works of the ancient Greeks) as meaning that surgery is an inferior kind of work. As a result, in medieval times physicians came to regard any method of treatment which involved the shedding of blood as being beneath their dignity.

After Vesalius's publication of his treatise on human anatomy the spirit of investigation once more stirred abroad, and the great French military surgeon of the 16th century, Ambroise Paré, introduced a rational attitude in the treatment of wounds. In 1760 Percival Pott published an important treatise on head injuries and gave an admirable account of extradural abscess. Instead of using the cruciate incision of the ancients, Pott exposed the skull by cutting out a complete circle of scalp, and he divided skull fractures simply into those with, and those without, depression, his practice being to operate on all cases of depressed fracture. But though Pott added considerably to our knowledge of head injuries, and men like himself and Cheselden did much to improve craftsmanship, no new principle was introduced into surgery from the time of Ambroise Paré until the advent of John Hunter towards the close of the 18th century.

During the first half of the 19th century surgical technique had developed to a state that could scarcely be excelled, but anæsthetics were still not available until Morton, in America, introduced ether in 1842 and Simpson, of Edinburgh, discovered chloroform in 1847. Even then the spectre of postoperative sepsis precluded any widening of the application of surgery, and operation on the body cavities was not attempted until 1867, when Lister introduced the principle of the antiseptic treatment of wounds. By this time knowledge of diseases of the nervous system had already been considerably advanced.

In 1862 Broca discovered that the posterior end of third left frontal convolution was the centre for articulate speech in right-handed persons. He was the first to trephine for cerebral abscess, the situation of which could now be defined by his theory of cortical localisation. In the latter half of the 19th century neurologists unravelled the syndromes of neurological disorders and built up, with the experimental physiologists, pathologists, and others, the foundations of modern neurosurgery. The first removal of a cerebral tumour was carried out in 1884 by Mr. Rickman Godlee, but the pathology and life-history of tumours was not fully understood, and the hydrostatic factors which complicated space-occupying lesions within the skull had still to be learnt by bitter experience.

In the last two decades of the 19th century knowledge of cerebral localisation increased immeasurably. Horsley may be said to have established the surgery of the central nervous system on a scientific basis. He standardised the methods of operative approach for brain and spinal-cord tumours, and was one of the first to realise that vision could be preserved, headache relieved, and life prolonged by decompression. Working in association with Gowers, he carried out the first successful removal of a spinal-cord tumour in 1887. One of the fields in which encouraging results were first recorded was in the treatment of intracerebral abscess. Sir William Macewen's classical work on the subject was published in 1893; of 20 cases on which he had operated all except two recovered. These results have not been surpassed, or perhaps even equalled, up to the present day.

In the opening years of the present century Harvey Cushing, in America, gradually built up a school of neurosurgery. There was a steady flow of new ideas from his clinic. The physiology of the pituitary was worked out by Cushing, and the enlargements to which it was subject were clearly defined.

At one time all tumours arising within the brain were lumped together as sarcomas. Neuropathologists demonstrated that these tumours arise from the supporting cells of the brain in the glia, and they renamed them gliomata. Recognition of their varying degree of malignancy and rate of growth helped greatly in directing the neurosurgeon when to stay his hand and when to try and effect a complete removal.

The diagnostic value of X rays was not utilised to the full in neurosurgery until after 1918, when Dandy demonstrated that air could be used as a contrast medium to outline the ventricular system, thus providing a method whereby not only the situation but also the size of most brain tumours could be determined. Another new form of radiological investigation was that of cerebral arteriography. A contribution of signal value was the adoption of the high-frequency current for the coagulation and excision of intracranial tumours by Cushing and Bovie in 1926. Diathermy served a dual purpose: it reduced the incidence of bleeding and paved the way for extirpation of many tumours whose removal previously had to be abandoned because of difficulties of access. Two very recent additions to our operative resources are substances prepared by the fractionation of human blood-plasma and named fibrin-foam and fibrin-film by their originators, Ingraham and Bailey, of Boston. The foam is of immense value as a hæmostatic agent, and the film provides an excellent dural substitute. Also great advances were made in overcoming sepsis by the introduction of the sulphonamides and penicillin. In the 1914–18 war the death-rate from wounds in which the dura had been penetrated was 55–60%, though Cushing, in his final series of selected cases, reduced the mortality to 28·8%. In the war of 1939–45 the death-rate from all forms of penetrating wounds of the brain, transventricular cases included, was about 8·9%.

Finally, Mr. Calvert said, neurosurgeons have had the temerity to invade the territory of the psychiatrist. Though the range of application of frontal leucotomy, originally devised by Moniz and Lima, and precise knowledge of the tracts in the brain to which section should be restricted still await accurate definition, many hundreds of leucotomies have been performed, and the results indicate the undoubted merit of the procedure in carefully selected cases.

Reconstruction

HOSPITALS

REGIONAL SURVEY OF NORTH-EAST

THE last of the hospital surveys,[1] dealing with the north-eastern area, which has now been published, is of the same high quality as earlier volumes in the series. The area includes two counties (Durham and Northumberland) and part of a third (North Riding of Yorkshire), eight county boroughs (Newcastle, Tynemouth, Darlington, Gateshead, South Shields, Sunderland, West Hartlepool, and Middlesbrough), and 81 minor authorities. The population exceeds two and a half million, served by 112 local-authority and 54 voluntary hospitals, with 11,634 and 4490 beds respectively. The survey area is coterminous with the region of influence of the Newcastle school of medicine, which should, in addition, extend to Carlisle and Cumberland, and a small area of Yorkshire around Whitby.

HOSPITAL BEDS

The surveyors follow the usual plan of dealing seriatim with the various kinds of hospital services—acute sick, chronic sick, accident services, ambulances, &c.—and then considering the facilities provided by each hospital, grouped into natural hospital districts; five of these are recommended, based on large towns which are social and business centres, but ignoring local-government boundaries. The surveyors comment on the interest of hospital managing bodies and of local doctors in the future of the hospitals, and their recognition that the services are not at present meeting all needs.

For the acute sick there should be more beds, more consultants (these, as elsewhere, can at present earn a living only in the teaching centre), and more up-to-date buildings; despite housing and school priorities, some new hospital building is urgently necessary. In the meantime, consultants should be trained. The general hospitals in which the acute sick are treated are classified into three main groups:

(1) The *teaching hospital* at Newcastle, the Royal Victoria Infirmary, which, with the municipal general hospital and the special hospitals, should form a centre whose influence and example would be felt throughout the region.

(2) *District* or *main hospitals* of 600–800 beds (some of which would be formed by combining several existing hospitals) which should be fully staffed by consultants, responsible for the treatment of both in- and out-patients.

(3) *Cottage hospitals*, which fulfil a useful purpose within their proper sphere. They are essentially general-practitioner hospitals, and, while they need some out-patient facilities, they should not retain patients needing special investigation and treatment.

The chronic sick, here as elsewhere, receive insufficient provision, both medical and social. Full investigation and any treatment should be available in large general hospitals before their admission to other institutions. Consultants should regularly visit the wards and institutions containing the chronic sick, among whom there is a large field for clinical research.

The accident services in an area of heavy industry such as this are already good in many places—the Victoria Infirmary probably treats more fractures than any other English general hospital—but further expansion of both accommodation and expert staff are needed in some parts. Rehabilitation should be available in every orthopædic department, special rehabilitation centres should be provided for long-stay inpatients, and each hospital district should have its own accident service. The ambulance services should be more closely coördinated, preferably on the basis of hospital districts; each of these should have a central bureau which would be available day and night.

SPECIAL SERVICES

For the orthopædic service the surveyors recommend the integration of an expanded service organised in three sections, for Northumberland, Durham, and the North Riding. The tuberculosis service, with 2146 beds, also requires some expansion, partly because more cases are recognised as needing treatment and partly because of the conditions imposed by modern therapy. Any accommodation which ultimately proves surplus to this particular work will be invaluable as a country open-air hospital. The tuberculosis service should be more closely associated with that of the general hospitals: closer attention, for the sake of both patients and staff, should be given to the kind of accommodation provided for advanced cases; and a better service would result from the grouping of authorities.

The surveyors hold the same opinions on the future provision of infectious-disease accommodation as their colleagues of other regions. The community-value of isolating these diseases is secondary to the advantage the patients can derive from expert treatment in large units. The existing 49 fever hospitals (with 2649 beds) should as a first step be reduced to 17 (with 1973 beds); but the apparent 34% loss of beds would be largely compensated by the increased provision of cubicle blocks, allowing of the easy treatment of different diseases in the same block with a minimal risk of cross-infection. The final concentration should be into 6 or so large hospitals; and in the meantime, infectious-disease units at general hospitals should be developed on an experimental basis. Smallpox, whose infectiousness still demands circumspection, may at present still be allotted to 16 hospitals, some of which are fit only for permanent closure. The use of specially built and isolated blocks inside the curtilage of large fever hospitals merits consideration, and one or two of the best fever hospitals to be disused should be kept in reserve to meet emergencies.

While the surveyors disagree on the desirable total of maternity beds, they are at one in recommending that the 434 beds available for a proportion of the 45,000 annual births should be supplemented by at least a further 200. Many, for normal deliveries, should be in small units, but all should be linked, on the basis of hospital districts, with the principal maternity hospital.

In the section on pædiatric services, the appointment of a professor of child health at Newcastle in 1942 is commended, and his importance in the training of future pædiatricians emphasised.

The North of England Joint Cancer Committee was formed in 1945, and covers not only the greater part of the survey area but also Cumberland and Carlisle. Investigation and follow-up are centred on the Newcastle hospitals; the central bureau is at the Victoria Infirmary, and non-surgical cases are mainly dealt with in the cancer unit at Shotley Bridge Emergency Hospital. Other approved hospitals will come into the scheme as associated hospitals; a cancer unit will be established at Cumberland Infirmary and joint consultation between clinician and radiotherapist to decide appropriate treatment is an accepted principle.

As elsewhere, existing pathological services need augmentation; pathologists, technicians, and laboratories are insufficient for the work which should be done. But in this field, as in many others, the needs of the region have already been considered at the instigation of the North-eastern Hospitals Regional Council. Durham, Newcastle, Gateshead, and Tynemouth have already agreed to establish a joint committee to take over the management of the university and city laboratories, and to coördinate the work with that of the Northumberland county laboratory; the nucleus of an authoritative epidemiological centre will thus be established. There should be association of the laboratories at South Shields and the Hartlepools with that at the Sunderland Royal Infirmary. There is also need for a pathological institute at Middlesbrough, and laboratories at Darlington and Durham.

NURSES

Here, as elsewhere, the demand for nurses exceeds the supply; but even before the war insufficient nurses were appointed for the number of hospital patients. This must be rectified, and the necessary increase in hospital and sanatorium beds will intensify the problem. Encouragement can be drawn from the fact that between 1936 and 1944 the number of nurses entering for the preliminary State examination increased by 75%; but wastage during the training period amounted to over 50%, so that the number qualifying increased by only 34%. The awkward gap between school-leaving age and the age of entry for nursing training may be partly surmounted by the introduction of preliminary courses in secondary and technical schools; 14 such schools have been approved in the north-eastern area. For the rest, the establishment of preliminary training schools and of the State roll of assistant nurses are steps in the right direction.

---

[1] Hospital Survey: the Hospital Services of the North-eastern Area. By Sir Hugh Lett, Bt., C.B.E., D.C.L., F.R.C.S.; and A. E. Quine, M.B., F.R.C.S., D.P.H. H.M. Stationery Office. 1946. Pp.

DISTRICT ORGANISATION

The surveyors recommend the organisation of the hospitals in the region on the basis of five hospital districts.

(1) *Newcastle,* with a population of almost 1¼ million, to include Northumberland, part of Durham, and the associated county boroughs. There is a general need for more beds and a particular need for more medical beds in Newcastle itself even when Durham's services are fully developed. The hospitals should have as their focusing-point a hospital centre in Newcastle, to include the Royal Infirmary and six of the special hospitals. When this becomes possible, a further 350 beds, to bring the total to 1250, will be needed, as well as more consultants, who should also be on the staffs of other hospitals. Other needs in this district are enlargements at Gateshead, a new hospital at Bedlington-Ashington, more maternity units, and more and better accommodation for the chronic sick. The local application of the surveyors' infectious-disease concentration policy is specified in this and the other districts.

(2) The *Sunderland district* has a population of nearly 360,000 and needs more acute beds (to be provided by additions to existing units), more consultants, and more maternity units.

(3) The *Middlesbrough district* also has a population of about 360,000; and a large new general hospital of not less than 800 beds is needed in Middlesbrough itself.

(4) The *Darlington district,* with a population of 170,000, should have the size of its municipal hospital almost doubled.

(5) The *Durham district,* with its 288,000 population, has mainly relied on Newcastle for its hospital services, and is short of indigenous facilities, which should be established round a new hospital at Dryburn and the Durham County Hospital.

In addition to these five districts, the surveyors give some consideration to the Hartlepools, where, at the time that their report was written, local considerations might have necessitated the development of a hospital service for the 120,000 people living in the area. In view of the proposals in the National Health Service Bill, however, the services in this area will probably develop in association with those of either the Sunderland or Middlesbrough district.

This report reflects the coöperation between all hospital services, municipal and voluntary, which has steadily developed in this region. This is further illustrated in the report for 1945 of the North-eastern Hospitals Regional Advisory Council which, under the active chairmanship of Lord Eustace Percy, has outlined development plans which should be of great use for the future. The pathological and accident services, maternity-bed provision, the hospital centre for Newcastle, the requirements of an outpatient polyclinic, and various other matters have been fully explored by special committees and subcommittees of the council.

"... It is easier to build a new hospital at the cost of a million pounds than to make sure that old-fashioned methods of treatment and nursing are not preserved inside those new walls."—Dr. HARLEY WILLIAMS in *Doctors Differ,* London, 1946, p. 99.

In England Now

A Running Commentary by Peripatetic Correspondent

THE psychiatrists have had a go—in fact a good man goes—at Hitler. It is time the neurologists had a chan and here are some data for them which are at any rat more concrete than the speculations on which th psychiatrists have based their diagnoses from a distance.

Mr. H. R. Trevor-Roper, writing about Hitler in th *Daily Telegraph* on Nov. 29, says: "In 1943 the firs symptoms of physical alteration became apparent Hitler's extremities began to tremble, especially the lef arm and the left leg, his left foot dragged upon th ground; and he developed a stoop. The tremor was not as has often been stated, a consequence of the explosio of July 20, 1944, it had already been obvious for som time, and the visible decline of the Fuehrer's health ha even been the subject of an emotional broadcast b Dr. Goebbels in April, 1943. . . . All witnesses of the fina days agree when they describe his emaciated face, hi grey complexion, his stooping body, his shaking hand and foot, his hoarse and quavering voice, and the film of exhaustion that covered his eyes." Now these allowing for the fact that they are the observations o laymen, are a remarkably accurate account of th symptoms of parkinsonism. Moreover, Mr. Trevor-Rope records that Hitler was being given a preparation containing belladonna, of which he took two to four pills with every meal. Mr. Trevor-Roper takes the view that Hitler's symptoms were due to the variety of drugs which he was given, but if Hitler had parkinsonism belladonna was the appropriate remedy. There must still be enough witnesses, perhaps even medical witnesses, to clear up the point.

If indeed Hitler had parkinsonism, was it due to encephalitis lethargica? And was his illness in 1918, when his eyes were affected, not hysterical at all but the initial attack of acute encephalitis which was epidemic at that time? If so, was this disease responsible for his aggressive temperament and all that followed from it, and also for his final downfall? Has the history of Europe in the last twenty-five years been merely a commentary on the activities of a neurotropic virus in one man's brain?

* * *

Wives of G.P.s with a char for two hours a day, a child of four, and a consulting-room in the house will anticipate what I mean when I say that it has been one of those days.

It was 7 P.M. with a gale howling when my husband was called out for the fourth time and 7.15 when the door bell chimed. A man stood on the step with his left hand swathed in a handkerchief. Poor devil, I thought, another injured hand. I was prepared to do my stuff. He glared at me and shouted angrily, "What have you done to your gate? Looks like wet paint. Why don't you put up a notice? And why don't you have something done about the street lights? Doctor's house, isn't it? Ought to be lit up."

"We are having the house painted," I explained mildly. "There was a notice but I suppose the gale has blown it away. The doctor is out on a call, but if you'll come in . . ." &c., &c. I felt fed up, but I warned myself that the man might be a neurotic under stress, his wife might be in labour, his children might be . . . "It's my little boy," he said, "I'd better wait."

I took him into the surgery, got a wad of cotton wool and some turps and handed it to him. I pulled a chair up and offered some magazines, including that morning's issue of *Punch.* "No thanks," he growled, "they're always months old." I felt myself getting hot where a man wears a collar. A crise de nerfs was pending. To my horror I found myself offering him a blank sheet of paper and saying, "In that case will you be good enough to write out another *Wet Paint* notice? I have a lot to do and the doctor has had nothing to eat since . . ." The phone shrilled. I was able to leave the man with considerable dignity.

I am wondering whether Mr. Bevan is going to get many applications for my job when 1948 comes round. In the meantime I'm reading Yellowlees on "The Human Approach" and taking phenobarb. After a few chapters of this excellent handbook for doctors' wives I realise that my caller should have been m xplicit if he wished to enlist my sympathy. Instead of "It's my little boy" he should have said "It's the little boy in me." I might have liked him then. Maybe.

* * *

I wish that some authority would solve my difficulty. Recently in speaking to a lady who was medically qualified I referred to another qualified lady by the word "doctor" prefixed by the word "lady." To my astonishment I was not allowed to proceed until I had listened to an impassioned protest against the use of such a designation. In mentioning this to another lady in the same qualified category but of a succeeding generation I was amazed to find that she eagerly supported the protest. Each lady objected strongly to being called a woman but did not find fault with the term "woman-doctor." For myself the latter term offends the few æsthetic susceptibilities which I retain and I refuse to include it in my vocabulary. But what word can I use? "Female doctor" is unthinkable, and "feminine doctor" might with truth be applied to some of the male gender. A "doctor of the softer sex" might have been accurate years ago but would be a euphemism now. So far as I can see the only solution is to use a suffix instead of a prefix and speak of a "doctoress." I see that the Oxford Dictionary prefers "doctress" but allows the longer form. In spite of everything I think my original term (which in deference to the ladies I have not used in this note) is quite as correct, more polite, and æsthetically inoffensive.

* * *

When Mrs. Jones, a panel patient 5 months pregnant, had a spontaneous rupture of the membranes the other day she started labour practically forthwith. After some cajoling on the telephone, the district midwife, evidently an exponent of the closed shop ("not really my case under 28 weeks"), went into action. She delivered a five months' fœtus (Albert I) which, unforgivably (as you'll see), made a respiratory movement and cried feebly for a moment or so after the cord was cut. Mr. Jones was informed of the fact and telephoned me, "Will you come at once, doctor, the baby's breathing." On my arrival the fœtus was as defunct as the proverbial doornail, and the midwife was engaged in delivering a twin of the same proportions (Albert II), but this one made no respiratory or vocal effort to enter this wicked world.

All this may seem very humdrum and commonplace, but what about the disposal of the dead? Albert I was obviously not entitled to a stillbirth, birth, death, extra coal, milk and egg, corset, or hot-water bottle certificate, but no undertaker could accept him without some such legal document; at the same time the off-hand disposal of his remains into the fire (indelicate and impractical anyway in these days of fuel shortage), the earth at the bottom of the garden, or my bag (a last resort) might be the subject of idle or malicious neighbourly gossip. Legally Albert I had never been a living being; factually he had, for a brief glorious moment, led an independent existence of which his parents were aware.

The coroner's officer was the only man to provide the answer: "Oh, a miscarriage that squeaked?" (How much better, how much more descriptive than technical jargon!) "Well you don't give any certificate, and do what you like with the remains."

The sum total of this little matter is that I have a couple of fœtuses for sale to offset a considerable telephone account (behind the scene backchat with midwife, fellow practitioner, fuel office, and coroner's office) and a large amount of time which might have been charged to Mrs. Jones's account—only as I said she's a panel patient and apparently all this comes within the scope—all for fifteen bob a year, in other words.

* * *

Our V.A.D. clerk in the Medical Division is obviously suffering from "mal du siécle" (20th-century version). Her latest typewritten report on a barium meal reads: "*Stomach J shaped, atomic. . . .*" Staggered by this discovery, I wondered who was in more urgent need of attention, the trooper whose stomach gracefully sagged, or the V.A.D. who had revealed such explosive forces in her subconscious mind.

* * *

"Oh yes, I've met *him*, of course—awfully decent fellow and all that, but frightfully *Third Programme!*"

Letters to the Editor

ETHER ANÆSTHESIA IN 1817?

SIR,—In the *Edinburgh Medical and Surgical Journal* of April, 1847 (vol. 67, p. 564), there is an article entitled "*Facts and Observations on the Inhalation of Sulphuric Ether Vapour as a Narcotic and General Anodyne, with a Description of the Instruments commonly used.*" The article is unsigned and, from the impersonal style of wording, it appears to be of the nature of an editorial commentary on the then recent employment of ether "anæsthesia," although that word is nowhere used by the writer. The greater part is devoted to an account of the work of Jackson and Morton in America, of that of Boote and Liston in London, of a fatal case at Colchester, and of five different patterns of ether inhaler, four of which are illustrated in the accompanying plate, including those used by Squire and Snow.

Apparently the writer does not accept as a new discovery the recent introduction of ether. He writes, "We do not allow that there is, in the administration of this agent to the human system, anything positively new"; and later, "To us it appears to be merely the application in an officinal form of an agent, the anodyne and narcotic effects of which have long been known." The most interesting part of the article, to present-day readers, is the description of a case thirty years previously in which ether had been used for the relief of pain. "In the year 1817," states the writer, "a woman was brought to the Royal Infirmary of this city, by persons who stated that in eating soup, a bone had stuck in the throat and threatened to choke her. She was labouring under great and agonising difficulty of breathing, could not speak, and often pointed to her throat as the seat of all her sufferings." At first the surgeon, whose name is not mentioned, could detect no foreign body, while his assistant "thought that inhalation of the vapour of ether might afford relief." This was used with excellent effect, and next day the surgeon "felt the end of some firm body" and, introducing forceps, he "withdrew a fragment of the superior maxillary bone of a hare." Two days later the patient left the hospital, cured. "The inhalation of the ether, however imperfect, had both relieved the present symptoms of the patient, and had enabled her to undergo more easily than she could otherwise have done the pain of examination for the splinter of bone, and afterwards that accompanying and following extraction."

It is not easy to understand why the writer, in 1847, should feel obliged to go back thirty years in order to find a case to illustrate his remarks, but he proceeds to state that the "narcotic and anodyne effects" of ether inhalation have been "long well known," and he appears to doubt whether "the present mania for etherism previous to operations can do all that is expected from it." He concludes by suggesting that in another twelve months' time the subject may "be considered in its true light and on its actual merits."

It is curious to read this critical contemporary evaluation of what we now regard as a major discovery, and to speculate on what might have happened if that Scottish surgeon of 1817, to whom the writer refers, had pushed his ideas—and his ether—a little further. It would be interesting to know who he was, who thus so nearly discovered the anæsthetic value of ether thirty years before Morton. Or did he actually discover it, while failing to realise its significance?

Edinburgh. DOUGLAS GUTHRIE.

CALCIFEROL FOR TUBERCULOUS ADENITIS

SIR,—In reply to Dr. Bell's inquiry in his letter of Nov. 30, calciferol therapy has been extensively employed at this hospital during the last few months. It was first started in the treatment of lupus vulgaris under the guidance of Dr. G. B. Dowling, and secondly it has been used in a series of cases of tuberculous adenitis. It is as yet too early to give the results in this latter group, but it is hoped to publish a paper on the subject with full pathological investigations in the next few months.

SUZETTE GAUVAIN.

Lord Mayor Treloar Cripples' Hospital.

ERYTHROBLASTOSIS FŒTALIS AND ITS TREATMENT

SIR,—Your editorial (August 17, p. 242) included a comprehensive evaluation of current methods of treating erythroblastosis fœtalis.

The frequent failure of repeated transfusions with Rh-negative blood, and the benefits of the exsanguination-substitution technique are especially important. A number of factors may influence the outcome in these cases. The effect of the stroma of lysed erythrocytes is hypothetical.[1] Toxic manifestations apparently can occur from the administration of red-cell stroma. This was shown by Wiener,[2] who attempted unsuccessfully to use this substance as a desensitising agent in the mother during pregnancy. It is also widely recognised that infants with hæmolytic disease often show listlessness, lack of tone, and inability to take food—symptoms which are frequently associated with toxicity in the newborn.

Consideration should also be given to the effect of the antigen-antibody reaction per se, and the resultant chemical substances which produce an effect similar to anaphylaxis. Inhibition of liver function attendant on improper oxygenation owing to the shock-like state may also be a factor. The effect of overwhelmingly large quantities of bilirubin upon a liver already damaged, with the resultant morphological counterpart of intrahepatic biliary obstruction, has already been stressed.[3] Individually or collectively these influences may well result in liver failure.

The significance of individual reaction to hæmolysis has recently been called to our attention by Rh-positive triplets born to a Rh-negative mother. All three showed varying intensities of hæmolytic disease, although they were all undoubtedly subjected to the same variety and amount of antibody. Similar experiences have been reported by others with regard to twin pregnancies,[4] but with a different interpretation. It was suggested that morphological variations of the placental vessels permitted the return of differing quantities of maternal antibody to each twin. While this theory may apply to the "leakage" of red blood cells, it does not appear likely that anatomical defects are necessary for the return of the antibody molecule through the capillary walls. It appears more probable that the antibody will pass through to each twin in equal concentration and at the same time. Thus the varying degrees of clinical erythroblastosis seen at birth are apt to be affected by differences in susceptibility or individual reaction on the part of the infant.

The concept of a direct action of the antibody upon tissue cells does not appear to be acceptable. This theory would postulate the presence of the antigen in those cells—a condition which is quite rare for the Rh antigen, if it exists at all. Even if present, these antigens should not be expected to behave in an exceptional manner, completely different from that of other isoagglutinogens known to be more frequently present in tissue cells and secretions as the A and B substances. The low incidence of hæmolytic disease due to the isoagglutinins anti-A or anti-B would seem to argue against such a mechanism with regard to the Rhesus antigen.

Whatever mechanism will be eventually proven as the cause of a poor prognosis in many of these infants, it appears likely that the removal of most of the Rh-positive cells and of the circulating antibody shortly after birth prevents the incidence of the more severe pathological and physiological changes. The choice of blood-vessels for the performance of the substitution must depend upon the experience of the operator in the techniques of bleeding. The umbilical vessels should be an excellent route for both the withdrawal and replacement procedures. They can only be used, however, if the decision to perform the substitution is made before birth, and universalised Rh-negative blood is prepared for the replacement.

According to our present knowledge such a course should be followed only when there have been siblings with severe or fatal erythroblastosis. One cannot rely solely upon tests for antibodies in the mother's serum as an accurate indication of impending disease. It is necessary to establish the criteria for therapy by c tions of the newborn infant's clinical and status. The colour of the amniotic fluid and the caseosa, the presence of jaundice, œdema, and megaly, and the response of the baby to stimuli be noted. Blood studies, including the extent of ana the nucleated red-cell count, serum proteins, bl group, and Rh status, should be performed. The hours needed to make these observations do not appre ably affect the safety period so far as the institution treatment is concerned, but do render the use of umbilical vessels impossible.

We have thus far treated 12 infants by the tion technique. The sagittal sinus has been used bleeding in 10 cases and the radial artery in 2. We as yet encountered no complications with the fc route. Of the 12 treated, 9 have recovered. Of babies who died, 2 were treated forty-eight hours longer after birth, and both showed autopsy evidence fully developed kernicterus and liver damage. third was given heparin to facilitate bleeding from radial artery, and at autopsy showed a tentorial lacerati with marked hæmorrhage. Since it has been show that silent intracranial injury is relatively commo it would appear that heparin is a dangerous drug to in the newborn infant.

In conclusion, permit me to say that your clear-c discussion of the problem was most enjoyable, and that should prove of considerable assistance in determinin the paths of further research.

Erythroblastosis Fetalis Clinic,
Jewish Memorial Hospital,
New York.

HARRY WALLERSTEIN
Director.

---

[1] Wallerstein, H. *Science*, 1946 103, 583.
[2] Wiener, A. S. *N.Y. St. J. Med.* 1945, 45 296.
[3] Davidsohn, I. *J. Amer. med. Ass.* 1945, 127, 633
[4] Demy, N. G. *Amer. J. Obstet. Gynec.* 1944, 47, 554.
[5] Potter, E. L., Adair, F. L. Fetal and Neonatal Death, Chicago 1940.

ICTERUS GRAVIS NEONATORUM

SIR,—I was pleased to read Sir Leonard Parsons friendly criticism (Nov. 30) of my article published Nov. 2. The paper invited criticism, and with such big subject I had found it difficult to be concise.

Muir's *Textbook of Pathology* (5th edition) divide jaundice into: (i) hepatogenous, (*a*) obstructive an (*b*) toxic; and (ii) hæmatogenous. The name "tox hepatogenous jaundice" is applied in this textbook conditions arising from damage to the liver parenchym of which acute yellow atrophy and icterus gravis ar cited as outstanding examples. Under the heading hæmatogenous jaundice are included such conditions acholuric jaundice, pernicious anæmia, sickle-cell anæmi and "the type of transient jaundice occurring in newbor children known as icterus neonatorum." Cappell[1] seem to agree that this is essentially a hæmolytic disease, bu further on he writes of the "immature" antibodies an the "mature" (blocking) antibodies as gaining a con centration sufficient to damage the fœtal tissues. "Ce tainly," he concludes, "many infants show severe live damage and the occurrence of cerebral necrosis wi kernicterus is well recognised." There are many othe factors to be considered: the incidence of the diseas with the suggestion that some may inherit the suscepti bility to isoimmunisation; the influence of a hetero specific pregnancy, with the so-called competition of th antigens; the sometimes grave illness of the infant ou of all proportion to the amount of antibody in th maternal serum; and, most significant, the severe illnes of the child with so little evidence of it in the periphera circulation. And so, rightly or wrongly, I took th view that true icterus gravis could not be wholl hæmolytic, but was a toxic condition.

Secondly, Sir Leonard Parsons criticises my opinio that blood-transfusion is satisfactory in erythroblastæmi only. I would inquire as to the average present age o his series of 250 babies, and whether they have bee examined, as mine were, at an average age of 18 month with special attention to possible abnormalities in the central nervous system. I also thought that some babies gravely ill with icterus gravis showed features suggesting the possibility of future kernicterus—deep jaundice, a feeble cephalic cry, extreme hypersensitiveness to light and touch, some suggestion of headraction, and an overall picture of an infant having a ture unlike that of a healthy infant.

---

[1] Cappell, D. F. *Brit. med. J.* Nov. 2, p. 641.

'Finally," Sir Leonard Parsons writes, "Rh antibodies re been found in breast milk, but the evidence that se have any ill effect on the child is, so far, insufficient warrant artificial feeding in preference to breast-ding, although it may be wise to express the breast lk and boil it before giving it to the child." Cappell vises simply heating the expressed milk (how much is t stated), while on the other hand Taylor and Race ommend that the child should be taken off the breast.

I would again stress the importance of homologous od-transfusion; no female in or below child-bearing e should be given whole blood without investigation her Rh group, and all Rh-negative donor panels uld be revised in the light of present knowledge. If is is not done we will in future years reap a rich rvest of anamnestic reactions and perhaps a higher idence of icterus gravis.

Nelson, Lancs. **HENRY THIRD.**

WELFARE OF DEAF CHILDREN

SIR.—As your annotation of Nov. 30 (p. 800) implies, e Education Act offers hope for better training of deaf hool-children, but there is still very little being done for deaf preschool child. It is between the ages of 2 and years that *preferential* consideration is needed because:

1. At this stage the child is keen to learn—is in an ppetitive" phase and more receptive of simple tuition.
2. For the partially deaf child there is enormous value in e early learning of sound language.
3. If the deafness is not recognised by the age of 2 years d training started immediately the child becomes mentally ckward as well as having both hearing and speech defects. his handicap cannot easily be overcome later.

It is not generally recognised that there are so many eaf children in Great Britain. Recent figures by the inistry of Education[1] show that among children under 5 years 1 in every 1000 is deaf and 1 in every 1000 artially deaf: this means that 2 in every 1000 school-ildren need consideration. Since 22% of the present opulation are children up to 15 years of age,[2] it follows at in each community of 120,000 persons there are out 50 deaf or partially deaf children: this is enough call for a separate school with five classes in it. efore school age these 50 children are in need of rgent help.

It is questionable whether it is advisable for very oung children to go to a residential school. The tearing way from home associations at an early life has many isadvantages. If facilities for day schools *and* home uition were made then the child would profit.

It is therefore important to stress:

1. The need for early recognition of deafness by parents and eneral practitioners. Any child not talking or obeying nstructions by the age of 2 years should be suspected of eafness.
2. The need for advisory centres to tell parents and G.P.s hen to send the child for (*a*) recognition of actual deafness, nd treatment if possible; (*b*) grading of the deafness into the ecognised groups of slight, moderate, severe, and total.
3. The need for more teaching centres for (*a*) preschool hildren; (*b*) school-children.
4. The need for more teachers of the deaf. Without these othing can be done to provide for no. 3.

It is hoped that the Medical Research Council sub-ommittee on educational problems of the deaf will soon elease useful and constructive findings both for future xperimental work and for present-day clinical and social mprovements. While awaiting this release other plans an be considered:

Long-term Policy.—(1) Foundation of a centre in London imilar to that in Manchester and several in the U.S.A. with full scope for training teachers, teaching children, and research.

(2) Amalgamation of all the different educational, social, religious, and medical societies dealing with, and interested in, deaf children into one vital force.

Short-term Policy.—(1) Enrolment of teachers for the deaf from demobilised men and women at once.

(2) Arrangement of small "nursery" clinics for preschool children where tuition could be given to the child and the parents. This is explained more fully below.

(3) Arrangement of lectures and meetings for parents.

(4) Provision of speech amplifiers to parents for home use with small children.

(5) Provision of more hearing-aids to individual children (in some even at the age of $4^1/_2$ or 5). It is reasonable to expect that soon the school authorities will allow children in the "moderate" group of partially deaf to go to ordinary schools, with aids which are efficient and strongly made, if preschool tuition has brought the child up to a suitable standard.

(6) Provision of more class amplifiers in schools for the deaf. A "moving up" of some of the moderately deaf would allow more facilities for the remaining more deaf pupils.

(7) Steps to make the hearing public more aware (e.g., by short films, &c.) of the plight of deaf children if neglected, and what can be done for them.

Nursery Clinics.—The preschool child need not, in these days of shortage of teachers for the deaf, be instructed by a fully qualified teacher. A speech therapist with training and experience in teaching lip-reading to infants, or a person with suitable background of the "nanny" type, could, with hearing-aid auxiliaries, take charge of small clinics. The clinics would be attached to ordinary nursery schools or to hospitals and welfare centres. In the clinics the child would be made conscious of the importance of language, as are the children trained by Miss Sylvian Martin at the late Infants Hospital, Vincent Square. Here the preschool child is able to grasp a vocabulary of about 200 words.

Setting up these preschool clinics would cover the time-lag before the educational scheme comes in and increased facilities are made available for this group of children.

So great is the need to "do something" now that hundreds of parents have already banded themselves together to form the Deaf Children's Society, which aims to push forward the urgent claims for better conditions. The society is keen to finance bursaries to the Department of Education of the Deaf, Manchester University, for students intending to become fully qualified teachers, and also to pay for one-year "courses" for the proposed preschool clinic teacher.

Research.—It is a heartening fact that many medical men are becoming more aware of the need for this branch of research; many are conducting research into various pathological and epidemiological aspects, such as deafness caused by intra-uterine infection from the virus of rubella, and the prevention of otitis media in the exanthemata of childhood. Further fields for exploration lie in (1) electronics in audiometry, hearing-aids, and teaching of voice control; (2) electroencephalography in deaf children; (3) all virus diseases as a possible cause of congenital deafness; (4) genetics as applied to deafness; and (5) advance in rational psychology of the deaf child.

ELISABETH EDWARDES
Secretary, Deaf Children's Society.

105, Gower Street,
London, W.C.1.

INVESTIGATION OF MALE INFERTILITY

SIR.—Might one appeal through your columns to pathologists throughout the country to establish a more expert and uniform service for undertaking seminological investigations?

The investigation and treatment of female infertility has advanced greatly within the last few years, but many of the excellent gynæcological advances are made ineffective on account of inadequate investigation and treatment of male infecundity. It is now accepted by authorities that in nearly one-half of the barren marriages some infertility is contributed by the male, and in perhaps one-fifth of all cases the causative factor lies exclusively with the husband. The fact that healthy young males who give no history of a genital lesion frequently produce an azoospermic semen, or one where the proportion of abnormal sperms is excessively high and their viability too short, implies a very serious need not only for adequate diagnosis but for the study of the as yet almost unexplored subject of treatment. If more laboratories would give better service in this work and would agree to make their reports in a more uniform way, it would greatly encourage the clinician in exploring the important matter of therapy.

---

[1] Special Educational Treatment. Ministry of Education Pamphlet, no. 5.

[2] Current Trend of Populations of Great Britain, March, 1942.

For the last eighteen months the Family Planning Association has run a laboratory entirely for the purpose of making seminological analyses and of studying post-coital cervical mucus. The laboratory is now working beyond capacity, and the physician in charge is willing to accept part-time clinical assistants and a certain number of grade I technicians for training. Many laboratories may be glad to send an assistant to acquire this experience and thereby contribute to the possibility of advancing a service of urgent national and individual importance. Correspondence should be addressed to Dr. H. A. Davidson, F.P.A. Laboratory, 33, Wimpole Street, W.1.

ALECK BOURNE
Chairman, Subfertility Committee,
Family Planning Association.

London, S.W.1.

SULPHONAMIDE GRANULOPENIA IN CHILDREN

SIR,—In his letter of Dec. 7 Dr. Suchecki draws attention to the suggestion of Drouet and colleagues that a so-called agranulocytic syndrome possibly embraces both acute leukæmia and true agranulocytosis. He describes the similarity of routine blood-counts in the early stages of both diseases and then states that the true diagnosis may be overlooked in those that are rapidly fatal. He goes on to claim that only "a necropsy or elaborate hæmatological investigations" will reveal the true state of affairs.

It cannot be too often stressed that the information obtained from routine examination of the peripheral blood alone in these cases is misleading. In order to differentiate between true agranulocytosis and acute leukæmia with leucopenia (aleukæmic leukæmia) more definite information must be obtained, and without this information a reliable prognosis cannot be given or rational treatment undertaken.

A careful search for enlarged lymphatic glands, however slight, should be made with a view to biopsy in the obscure case, but the sternal-marrow biopsy should never be omitted since the smear obtained is often of extreme value in diagnosis. The technique of sternal-marrow puncture is very simple and safe, whether performed on adults or children, and this should never be regarded as merely another superfluous clinical investigation of an "elaborate" nature and of academic interest only. Experience is, however, essential if the smears are to be interpreted correctly.

Royal Infirmary, Manchester. FRANK FLETCHER.

VARIATIONS IN THE FEMALE PELVIS

SIR,—Dr. Nicholson and Mr. Sandeman Allen in their article of August 10 state that they have produced evidence to disprove three propositions, of which the first is as follows:

1. "The android pelvis is, as its name implies, a male pelvis; it is caused by some abnormality in sex differentiation, and is associated with male stigmata in the female."

I am puzzled by their statement that "obstetricians who accept the theory hold views on genetics, embryology, and anatomy which would be regarded as unorthodox by the geneticist, the embryologist, and the anatomist." There is considerable evidence that females may have pelves with many features of the type one associates with the male. Elliot Smith and Wood Jones, from their archæological survey of Nubia, mention that in 5 of the bodies found it would have been impossible to fix the sex had not fœtal bones been found in the body cavities. They go on to say that they would otherwise have classified them as males. Furthermore in Prof. Wingate Todd's collection of skeletons of known sex in the Western Reserve University of Cleveland, Caldwell and Moloy found that 32·5% of white women's and 15·7% of black women's pelves were "android." By "android" they mean a pelvis with some or all of the following features:—

Inlet blunt, heart-shaped or wedge-shaped.
Fore-pelvis narrow, and the anterior pubo iliac limbs of the fore-pelvis straight.
Widest transverse close to the sacral promontory.
Posterior iliac portion short.
Sacro-sciatic notch narrow and high arched; thus the segment of the inlet is wide and flat.
Sacrum set forward in the pelvis, decreasing the sagittal measurement.
Pubic rami long and straight edged with a deep true
Bones heavy, angular, and less graceful than in the

They add that the fore-pelvis may be wide, as in android-gynæcoid pelvis, and in this case there may wide subpubic angle to compensate for a male hind-pelvis. They conclude that in the worst the prognosis for vaginal delivery is poor, and indicates cæsarean section; and also that the worst of all are seldom seen outside sterility clinics, and occur in women with amenorrhœa.

The remaining propositions mentioned by Nicholson and Mr. Sandeman Allen were:

2. "The android pelvis and to some extent the anth pelvis are associated with a narrowing of the outlet the pelvis, particularly with contraction of the angle."
3. "The android pelvis is associated with difficulty in labo

"The evidence in rebuttal of these two proposi they say, "is drawn from the radiographical measure ment of 307 women who were eventually delivered the hospital at full term as vertex presentations durin the years 1936–43 inclusive." The series is very smal and one naturally asks how much abnormal materi is likely to be encountered in eight years in a sma country hospital which X rays only about 35 patien yearly from the obstetric point of view. Compare th series of 1000 clinically suspect pelves presented b Méave Kenny (*J. Obstet. Gynæc.* 1944, 51, 277). In the 1000 cases, taken from 10,000 consecutive deliveri she found, using the Caldwell and Moloy classification

Gynæcoid	348	Pithecoid (anthropoid)	[illegible]
Gynæcoid-android ..	110	Platypelloid	[illegible]
Android..	203	Rickety flat	[illegible]
Android-gynæcoid ..	251	Osteomalacic	[illegible]

The 307 cases are stated to include full-term vert presentations only. What happened to abnormal pres tations and to those cases subjected to cæsarean section Also were any patients subjected to surgical inductio of labour? Méave Kenny found that 56% of the suspect cases had android pelves of one type or and reckons that, in normally fertile women, only a 3% of the pelves are likely to be of a pronounced andro type. Thus one might expect to find only about 9 cas in a series of 307 unselected healthy adult English women. If that were so, the exclusion of all abnormalities, such as malpresentations and cases treated by cæsarean section, which at the lowest must total 5% of all cases seen, tends to negative the value of th investigation.

The authors suggest that the posterior sagittal seg ratio, at the brim, is one on which they rely for th identification of the scutiform pelvis. If they identi the android with the scutiform pelvis, their stat appears to be at variance with the findings of Ince a Young in their anthropological survey of 500 pel by X-ray methods (*J. Obstet. Gynæc.* 1940, 47, 130). These authors say that the posterior sagittal segment ratio at the brim is only slightly less in the male than in the female, and that it does not appear to be as important in differentiating android from gynæcoi types as Caldwell and Moloy suggest. At all events one is going to rely on the posterior sagittal inde (percentage ratio of posterior sagittal measurement to that of whole conjugate) why adopt an index of 30 as the upper limit of android or scutiform pelves? This as the authors say, leaves about 10% of their cases in the scutiform class; yet the impression of those seeing large numbers of pelvic X rays is in agreement with Méave Kenny's view—namely, that only 3–5% at most of normal fertile women have android pelves. Had they, for instance, chosen 25 as their sagittal index limit, the "scatter diagram" would show only 4 scutiform pelves instead of 28. I contend, in other words, that by eliminating all abnormalities before they start, and by including as scutiform many pelves which might more properl be called gynæcoid, they "prove" that the scutiform android pelvis is not the fearsome thing that we have n led to believe.

Maeve Kenny found an interference rate of 76·4% android-gynæcoid pelves and one of 82·5% for pure droid pelves, compared with only 12·9% for her 348 næcoid cases. She concluded that the android hindlvis plays a most sinister part in the causation of stocia.

London, W.1. D. G. WILSON CLYNE.

THE ELECTRONIC AND HUMAN BRAIN

SIR,—Many will support, with you, Dr. Walshe's mely plea for more conceptual thinking. It is, as you y, in line with the developments of modern science. ut why limit your exemplifications to the "opposite" hools of Eddington and Bertrand Russell? Why is o mention made of dialectical materialism? Here we ve a philosophy which is, I think, quite satisfying to e scientific mind. It rejects metaphysics, but not nceptual thinking about observed facts. It rejects echanistic materialism, as modern science must reject , but insists that no concepts and entities extraneous om Nature must be introduced in the explanation of tural phenomena. It explains, in general terms, the ws of development and change, and thus helps in the vestigation of particular changes. Finally, whilst reserving a strict respect for facts, it stresses the portance of man in changing the facts, when he acts n them *secundum artem* and not by mere whim or sire.

This is a school of thought sufficiently important, in ritain and abroad, not to be passed over in silence.

London, W.1. E. MONTUSCHI.

CHILD HEALTH

SIR,—Prof. Richard Ellis, in the lecture you reviewed ast week (p. 871), spoke of the work of the late Lord Baden-Powell of Gilwell as the greatest influence for good on the health of the older child.

Gilwell Park is synonymous with camping at its best, and throughout the country other camping grounds, under the auspices of the Boy Scouts' Association, are eaching the elements of hygiene and creating the physique and psychological outlook inalienable to good ealth. The boys have to do everything for themselves, utilising every muscle in their frames, as well as their wits, and the results fully confirm the high opinion of the movement expressed by Professor Ellis. The Boy Scout movement has prepared boys to render signal service to the injured and those in danger of loss of life, and we are not unmindful of those boys with a physical handicap, for whom special tests are devised so that they may join in and enjoy the benefits of scouting.

The more that doctors examine the aims and objects of the movement as concerning the health of the child the more they will understand the need for full ollaboration.

Kew, Surrey. AUSTIN WILLIAMS.

R.N.V.R. OFFICERS' COMMEMORATION FUND

SIR,—During the war no less than 2700 doctors held ommissions in the Royal Naval Volunteer Reserve. They served with great distinction in all classes of ships and in all parts of the world. Many lost their lives. It may therefore interest members of the medical profession to know that the R.N.V.R. Officers' Commemoration Fund has been opened to commemorate in a practical way the part R.N.V.R. officers played in the war, and in particular those who lost their lives. The fund has two objects: (1) to purchase and equip the new premises of the R.N.V.R. Club; and (2) to start an adequate welfare fund to help R.N.V.R. officers and their dependants who may stand in need.

The new club will have a memorial tablet, and relatives of officers who were killed may through this fund have officers' names inscribed on it. This club, started during the war, has grown from nothing to an institution with 0,000 members, and it provides good and cheap meals, accommodation, and amenities, particularly for junior officers. But it must leave its war-time premises, and without help it cannot get into new premises. The administration of the welfare fund is closely integrated with that of King George's Fund for Sailors.

We sincerely hope that many members of the medical profession, so many of whom served in the R.N.V.R., will give their support. The money is urgently needed. R.N.V.R. officers themselves have generously supported the fund, but most of them are young, and it is hoped that the outstanding part that they played in the war (when they formed 80% of the officer strength of the Navy) will commend this appeal favourably to their fellow-countrymen.

Cheques should be sent to Commodore Earl Howe, R.N.V.R. Club, 52, Pall Mall, London, S.W.1.

W. W. ASTOR
Chairman.

London, S.W.1.

Medicine and the Law

Death after Gold Salt

AT an inquest in Manchester recently evidence was given that a 47-year-old woman had died from cerebral hæmorrhage following injections of gold. In 1942 the patient, who had rheumatoid arthritis, had received this therapy in hospital. The condition had improved, but a year later relapsed; she attended hospital for further injections as an outpatient; but since she was unable to make the journey the treatment was continued by her own doctor. In January, 1945, she was again admitted to hospital, where the white-cell count in the blood was found to be below normal: the last two counts before discharge were just within normal limits.

Gold treatment was resumed by the patient's doctor in September, 1945, and the first sign of intolerance appeared after the seventh injection. Even after the eighth injection, which resulted in a bruise on the arm, the patient felt quite well; but subsequent symptoms caused the doctor to discontinue treatment and refer the patient to hospital. A verdict of death by misadventure was recorded by the city coroner, who added that even if a general practitioner himself had no facilities for a blood-count this could be obtained at a hospital

Public Health

Tuberculosis Allowances

THE Ministry of Health has produced a circular (no. 221 46) giving local authorities guidance over the effect of family allowances and the recent increase in the rate of old-age pensions on poor-law relief, tuberculosis allowances, financial assistance under the Blind Persons Act, and contributions towards the cost of hospital treatment and of maternity and child-welfare services.

The purpose of the Family Allowance Act, the Ministry says, is to supplement a man's wages, which otherwise take no account of the size of his family. The allowances payable to the tuberculous under memorandum 266 T already vary according to the size of the family, children's allowances being paid at the rates published in our issue of Dec. 7 (p. 852). If ordinary family allowances were paid in supplement to them, double provision would be made for dependent children, and it is a cardinal principle of the comprehensive insurance plan and health service now being created that double allowances of this kind should be avoided.

A DEPUTATION TO THE MINISTRY

The future of tuberculosis allowances was discussed by a deputation from the Joint Tuberculosis Council and other bodies which waited on the Ministry of Health on Nov. 15. Introduced by Dr. C. K. Cullen, the deputation was received by Sir Arthur Rucker, with Sir Wilson Jameson in the chair. Representatives of the Ministry of National Insurance, the Assistance Board, the Department of Health for Scotland, and other officers of the Ministry of Health were also present.

The Ministry, it was explained, fully accepted the view that tuberculosis calls for special provision; but this would have to be made within the general pattern of the new social legislation. The National Insurance Act would provide benefits in various adversities. For those who needed something more, this would be forthcoming under a National Assistance Bill (now in preparation) which was to sweep away the poor-law and give effect to a new concept of Government assistance. Tuberculosis patients would be basically provided for in this way; but, by virtue of their special needs, the Assistance Board would, it was hoped, be empowered in the new Bill to make payments to needful persons under treatment for pulmonary tuberculosis on a scale higher than the normal scale of assistance applicable to the community as a whole. It was intended that the tuberculosis officer and the dispensary organisation should be associated with the administration of this assistance; and the grant of the special rate of assistance would be conditional on the patient undertaking approved treatment. The discrimination against so-called chronic cases of pulmonary tuberculosis under the present scheme would disappear.

The higher level of assistance would, however, be limited to cases of pulmonary type. In the Ministry's view, persons suffering from non-pulmonary tuberculosis were in a rather different category: it was not necessary to induce them to give up work, while still capable of it, in order to undertake treatment and to lessen the risk of spreading infection. The non-pulmonary patient would be able to receive, besides insurance benefit, supplementary allowances from the Assistance Board, and help from the care committee; and representations to the Assistance Board regarding any individual case would always receive sympathetic consideration.

The deputation sought to urge that the position of the susceptible family of a tuberculous patient was the same whether the case was pulmonary or non-pulmonary. But the Ministry held that, important as this consideration was, it was not of overriding cogency, and to attempt at this stage to extend the special provision to non-pulmonary patients might involve the risk of failing to obtain it for pulmonary patients, for whom a much stronger case could be made out.

It was explained that care and aftercare work for the sick, including the tuberculous, would be the responsibility, under the National Health Service Act, of local health authorities. They would be precluded from giving monetary assistance, but if a voluntary body participated in such work there would be nothing to prevent it using its funds as it wished.

The Ministry took note of criticism regarding the deduction of family allowances from payments under the present tuberculosis scheme, and the alleged inadequacy of the general scale-rates under this scheme.

Infantile Gastro-enteritis

An outbreak of gastro-enteritis in the maternity nurseries, affecting 36 newborn babies, led to the closure of the maternity department of the City General Hospital, Leicester, on Dec. 11. An infant died of gastro-enteritis in the nurseries on Sept. 6, and up to Nov. 17 there were 7 isolated cases, 3 in one nursery and 4 in another, 5 of them proving fatal. Between Nov. 26 and Dec. 1 there were 6 further cases. On Dec. 4 and the succeeding few days there was an explosive outburst, involving 25 further babies, the infection having spread to another emergency nursery. Among the total of 38 cases since Sept. 6 there have been 15 deaths. The diarrhœa or vomiting has developed between the third and sixteenth days, the average day being about the fifth. Some children have had pyrexia and others none. Most of the children who have died have survived until the second week. In treatment, penicillin, sulphaguanidine, and sulphathalidine have been used, but in the severe cases these drugs did not alter the course of the illness. No pathogenic bacteria have been discovered in the stools and the supposition is that the infection is due to an unidentified virus. During the same period some mothers developed mild diarrhœa, and no pathogenic organisms were isolated from their stools.

Similar outbreaks have occurred in St. Joseph's Hospital and Sharoe Green Hospital, Preston, and Cowley Road Hospital, Oxford, at which the maternity wards have been closed.

Infectious Disease in England and W

WEEK ENDED DEC. 7

Notifications.—Smallpox, 0; scarlet fever, whooping-cough, 1783; diphtheria, 313; 6; typhoid, 7; measles (excluding rubella), pneumonia (primary or influenzal), 677; fever, 40; poliomyelitis, 14; polioencephalitis, encephalitis lethargica, 1; dysentery, 76; pyrexia, 128; ophthalmia neonatorum, 60. No of cholera, plague, or typhus was notified during week.

Deaths.—In 126 great towns there were no from scarlet fever or enteric fever, 4 (0) from diphth 3 (0) from measles, 6 (1) from whooping-cough, 6 from diarrhœa and enteritis under two years, and 2 from influenza. The figures in parentheses are thos London itself.

The number of stillbirths notified during the week 264 (corresponding to a rate of 27 per thousand births), including 24 in London.

Parliament

FROM THE PRESS GALLERY

Scotland's Turn

MOVING the second reading of the Scottish Health Service Bill on Dec. 10, Mr. J. WESTWOOD p out that it differed from the English Bill in some as was but fitting, for Scotland had her own legal traditions, and system of local government. M the geographical distribution of her population different.

THE HEALTH CENTRES

In the general-practitioner service, the only concerned health centres. Local conditions varied and, as the country was not an unmanageable unit had thought it best that the early steps in health development should be undertaken directly by Secretary of State. In that way the lessons of the e years could best be learned and generally applied. Scottish local authorities had made no serious objec to this course, and the medical profession had prefe that it should be so. The Bill allowed these to be gated to local authorities, but Mr. Westwood said he not intend to exercise that power in the early experimental years of the service.

In Scotland, as in England, although payment capitation fees would represent the larger part of doctor's remuneration, there would also be an elemen basic salary. That doctors in Scotland should look u this fearfully surprised Mr. Westwood, for basic sala by another name had for the last thirty years been essential feature of the Highlands and Islands Med Service, to which so many tributes had been paid doctors themselves. As in England, sale and purch of medical practices coming within the new ser would be prohibited, and Scottish doctors would sh in the £66 million provided by the Government compensation.

The Committee on Scottish Health Services, wh reported in 1936, had expressed the view that hospi administration should be one service and should organised on regional lines. But while everyone accept the need for a regional hospital system, it was not equa appreciated that it was not possible so long as there w two different forms of hospital administration and own ship. In Scotland there were 250 hospitals belongi to 55 local authorities, and about another 220 volunta hospitals, practically every one of which had a separ governing body. With such a multiplicity of authorit there would be overlapping, unnecessary competiti and, worst of all, gaps in the hospital service. As far he could judge from his discussions, these propos were generally acceptable to those in Scotland who h to work in hospitals, and even to some of the loc authority and voluntary-hospital people, whose respo sibilities were being taken away. The maximum indepe dence would be left with the boards of manageme and he intended so far as he could to leave the f regional boards to get on with their job.

OTHER DIFFERENCES

Three features of the hospital proposals, he continued, re peculiar to Scotland. The English Act put the ponsibility for the ambulance service on the local alth authorities, but the Scottish Bill put it on the cretary of State. This was the right thing to do in otland where the local health authorities were smaller area and population.

The next difference concerned the teaching hospitals. om an early stage of the Government's discussions he d been clear that the English arrangement was unsuitable for Scotland. Although the number of hospital ds in Scotland was only about a tenth of the total for e United Kingdom, Scotland was training about a ird of the medical students—a remarkable achievement. Therefore, if the teaching hospitals were taken t of the regional ambit, the core of the Scottish hospital rvice would have gone. He had therefore tried to ame an alternative scheme with the same general aim f safeguarding the position of medical education. He ought that the universities would accept generally at the Bill would enable them to discharge their sponsibilities to their own satisfaction. The Bill laid clear duty on the responsible Minister, and through m on the regional boards and boards of management, o make available all the necessary facilities for clinical aching and research. When the regional board drew p its scheme for the constitution of boards of managements for hospitals it must consult the university to stablish in which hospitals teaching was to be carried on, and on the boards of these hospitals the university must be represented. There would be a medical education committee in each region to advise the board on all matters relating to the hospital services which affected medical education.

The Bill also provided that boards of management, whether of teaching or non-teaching hospitals, would in the first place retain the endowments of their hospital. In the new conditions, when many endowments would not be needed for their original purpose, some review and reallocation was necessary.

Turning to the local health authorities, Mr. Westwood said that their most important function in the future was e social side of health care. This was linked with their broad duties in connexion with the control of infectious diseases. But they had yet another part to play in the new service. They represented the consumers, and for this reason they nominated a third of the members of the executive councils responsible for the general-practitioner services. They would also be consulted in the appointment of regional boards and boards of management. In framing the regulations under the Bill it would be the earnest desire of the Government to have full and free discussions with all the interests concerned, including the organisations of professional men and women on whose good will and coöperation the success of the health service depended.

THE DEBATE

On behalf of the Opposition Mr. J. S. C. Reid moved an amendment calling for the rejection of the Bill. It put, he declared, too much power in the hands of the Minister and left too little scope for initiative and sponsibility on the part of those who were to run the service. Almost all the objectionable provisions which injured the patient by undermining the independence of the medical profession centred on the control of the distribution of doctors, yet the average number of people per general practitioner in Scotalnd was 2000, and only 3 areas could be held to be underdoctored. He was amazed that the teaching hospitals had been treated so much less favourably than in the English Bill and for such flimsy reasons. In England the teaching hospitals through their board of governors were in direct contact with the Minister and with the universities, and kept their endowments. In Scotland in future they would only have boards of management and become mere units in a large scheme, while all their endowments were subject to reallocation.

Sir John Graham Kerr dubbed the Bill the product of diligent artificers working in the murky recesses of a Whitehall office. At present the finest material was coming into the science of medicine. It was the leaders of the profession who were training it. But they did that work because they realised that it would give them an opportunity to inspire their students, and that they would be paid back, indirectly, by forming a great clientele of practitioners who would come back to consult them later on. The type of man who went into a university, or other school of medicine, and later into the profession, was not the sort of person who was interested in a salaried service in which promotion went merely by seniority. If the Bill were passed into law it would be one of the greatest disasters to the health of the people.

Colonel Walter Elliot held that the Bill would be a better one if it followed Scottish traditions instead of trailing at the heels of the English Bill, or indeed of its Welsh instigator. Why had the Hetherington report been thrown overboard and this new parentless institution brought in? In carrying out the Highlands and Islands Service it had not been found necessary to nationalise a single hospital.

In summing up, Mr. G. Buchanan, joint Under-Secretary of State, said they had sought to avoid the difficulty of defining a teaching hospital; and to leave out of this new experiment 230 hospitals—almost half the total—would make a sham of the whole scheme. They had been criticised for not giving enough power to local government. But nowadays it was said that there must be some form of workers' control. And here the workers were the doctors. They must be given some rights and on the whole they did not want the local-authority set-up.

Petition against Vivisection

In the House of Commons on Dec. 12 Mr. Peter Freeman presented a humble petition protesting against the practice of vivisection on live animals with or without anæsthetics. The petition, signed by 1972 petitioners, declared vivisection to be morally unjustifiable, scientifically useless, dangerous, and demoralising to the community, and earnestly prayed that the House would pass a Bill withdrawing the sanction of the law from its practice.

QUESTION TIME

Psychiatrists on Selection Boards

Mr. Geoffrey Cooper asked the Secretary of State for War on what grounds a decision had been made to remove qualified psychologists and psychiatrists from officer selection boards, in view of the fact that these experts devised the successful techniques now in use.—Mr. F. J. Bellenger replied: The function of the Service psychiatrist is to advise the executive authorities on matters of mental health and adjustment. It is open to the presidents of officer selection boards to consult the Service psychiatrists, or specialists in other branches of the medical profession, if they find reason to do so. Psychiatrists and psychologists are both consulted in the formulation of the technique adopted by the boards.

Mr. Cooper: Have psychologists and psychiatrists been dropped? The answer does not make that point clear.—Mr. Bellenger: They have not been dropped, but they are not now necessarily members of these selection boards. —Mr. Cooper: Does the Minister know that the presence of psychologists and psychiatrists on these boards during the war won the confidence of the serving men, and increased the number of other ranks who applied for commissions? —Mr. Bellenger: As long as the services of psychiatrists are made available, if necessary, that is all, I think, my hon. friend can ask for. I may tell him that there was a good deal of objection to these psychiatrists among the men.

Brigadier A. H. Head: Is the Minister aware that all other ranks did not share the view of the hon. member, and that some of them referred to the psychiatrists as "trick cyclists"?—Mr. Cooper: Was that on the part of senior officers or other ranks?—Mr. Bellenger: I am well aware of that, but I think we ought to get this question in its correct perspective. Psychiatrists were of great value in many cases.

Release of R.A.M.C. Officers Serving in India

Major E. A. H. Legge-Bourke asked the Secretary of State for War if he would state, by age and service groups, the number of R.A.M.C. officers now serving in the India Command whose release had been compulsorily deferred distinguishing specialist and general duties officers.—Mr. Bellenger replied: Up to Nov. 15 there has been no case

The Ministry, it was explained, fully accepted the view that tuberculosis calls for special provision; but this would have to be made within the general pattern of the new social legislation. The National Insurance Act would provide benefits in various adversities. For those who needed something more, this would be forthcoming under a National Assistance Bill (now in preparation) which was to sweep away the poor-law and give effect to a new concept of Government assistance. Tuberculosis patients would be basically provided for in this way; but, by virtue of their special needs, the Assistance Board would, it was hoped, be empowered in the new Bill to make payments to needful persons under treatment for pulmonary tuberculosis on a scale higher than the normal scale of assistance applicable to the community as a whole. It was intended that the tuberculosis officer and the dispensary organisation should be associated with the administration of this assistance; and the grant of the special rate of assistance would be conditional on the patient undertaking approved treatment. The discrimination against so-called chronic cases of pulmonary tuberculosis under the present scheme would disappear.

The higher level of assistance would, however, be limited to cases of pulmonary type. In the Ministry's view, persons suffering from non-pulmonary tuberculosis were in a rather different category: it was not necessary to induce them to give up work, while still capable of it, in order to undertake treatment and to lessen the risk of spreading infection. The non-pulmonary patient would be able to receive, besides insurance benefit, supplementary allowances from the Assistance Board, and help from the care committee; and representations to the Assistance Board regarding any individual case would always receive sympathetic consideration.

The deputation sought to urge that the position of the susceptible family of a tuberculous patient was the same whether the case was pulmonary or non-pulmonary. But the Ministry held that, important as this consideration was, it was not of overriding cogency, and to attempt at this stage to extend the special provision to non-pulmonary patients might involve the risk of failing to obtain it for pulmonary patients, for whom a much stronger case could be made out.

It was explained that care and aftercare work for the sick, including the tuberculous, would be the responsibility, under the National Health Service Act, of local health authorities. They would be precluded from giving monetary assistance, but if a voluntary body participated in such work there would be nothing to prevent it using its funds as it wished.

The Ministry took note of criticism regarding the deduction of family allowances from payments under the present tuberculosis scheme, and the alleged inadequacy of the general scale-rates under this scheme.

Infantile Gastro-enteritis

An outbreak of gastro-enteritis in the maternity nurseries, affecting 36 newborn babies, led to the closure of the maternity department of the City General Hospital, Leicester, on Dec. 11. An infant died of gastro-enteritis in the nurseries on Sept. 6, and up to Nov. 17 there were 7 isolated cases, 3 in one nursery and 4 in another, 5 of them proving fatal. Between Nov. 26 and Dec. 1 there were 6 further cases. On Dec. 4 and the succeeding few days there was an explosive outburst, involving 25 further babies, the infection having spread to another emergency nursery. Among the total of 38 cases since Sept. 6 there have been 15 deaths. The diarrhœa or vomiting has developed between the third and sixteenth days, the average day being about the fifth. Some children have had pyrexia and others none. Most of the children who have died have survived until the second week. In treatment, penicillin, sulphaguanidine, and sulphathalidine have been used, but in the severe cases these drugs did not alter the course of the illness. No pathogenic bacteria have been discovered in the stools and the supposition is that the infection is due to an unidentified virus. During the same period some mothers developed mild diarrhœa, and no pathogenic organisms were isolated from their stools.

Similar outbreaks have occurred in St. Joseph's Hospital and Sharoe Green Hospital, Preston, and Cowley Road Hospital, Oxford, at which the maternity wards have been closed.

Infectious Disease in England and

WEEK ENDED DEC. 7

Notifications.—Smallpox, 0; scarlet fever, whooping-cough, 1783; diphtheria, 813; para 6; typhoid, 7; measles (excluding rubella), *pneumonia (primary or influenzal), 877;* fever, 40; poliomyelitis, 14; polioencephalitis encephalitis lethargica, 1; dysentery, 76; p pyrexia, 128; ophthalmia neonatorum, 60. No of cholera, plague, or typhus was notified during week.

Deaths.—In 126 great towns there were no from scarlet fever or enteric fever, 4 (0) from diph 3 (0) from measles, 6 (1) from whooping-cough, 69 from diarrhœa and enteritis under two years, and 21 from influenza. The figures in parentheses are those London itself.

The number of stillbirths notified during the week 264 (corresponding to a rate of 27 per thousand births), including 24 in London.

Parliament

FROM THE PRESS GALLERY

Scotland's Turn

MOVING the second reading of the Scottish Na Health Service Bill on Dec. 10, Mr. J. WESTWOOD poi out that it differed from the English Bill in some as was but fitting, for Scotland had her own legal sy traditions, and system of local government. M the *geographical distribution of her population* different.

THE HEALTH CENTRES

In the general-practitioner service, the only concerned health centres. Local conditions varied and, as the country was not an unmanageable unit, had *thought it best that the early steps in health* development should be undertaken directly by Secretary of State. In that way the lessons of the years could best be learned and generally applied. Scottish local authorities had made no serious to this course, and the medical profession had preferred that it should be so. The Bill allowed these to be dele gated to local authorities, but Mr. Westwood said he did not intend to exercise that power in the early and experimental years of the service.

In Scotland, as in England, although payment by capitation fees would represent the larger part of the doctor's remuneration, there would also be an element of basic salary. That doctors in Scotland should look upon this fearfully surprised Mr. Westwood, for basic salaries by another name had for the last thirty years been an essential feature of the Highlands and Islands Medical Service, to which so many tributes had been paid by doctors themselves. As in England, sale and purchase of medical practices coming within the new service would be prohibited, and Scottish doctors would share in the £66 million provided by the Government as compensation.

The Committee on Scottish Health Services, which reported in 1936, had expressed the view that hospital administration should be one service and should be organised on regional lines. But while everyone accepted the need for a regional hospital system, it was not equally appreciated that it was not possible so long as there were two different forms of hospital administration and ownership. In Scotland there were 250 hospitals belonging to 55 local authorities, and about another 220 voluntary hospitals, practically every one of which had a separate governing body. With such a multiplicity of authorities there would be overlapping, unnecessary competition and, worst of all, gaps in the hospital service. As far as he could judge from his discussions, these proposals were generally acceptable to those in Scotland who had to work in hospitals, and even to some of the local-authority and voluntary-hospital people, whose responsibilities were being taken away. The maximum independence would be left with the boards of management and he intended so far as he could to leave the five regional boards to get on with their job.

OTHER DIFFERENCES

hree features of the hospital proposals, he continued, e peculiar to Scotland. The English Act put the ponsibility for the ambulance service on the local lth authorities, but the Scottish Bill put it on the retary of State. This was the right thing to do in tland where the local health authorities were smaller area and population.

he next difference concerned the teaching hospitals. m an early stage of the Government's discussions he l been clear that the English arrangement was unsuit- le for Scotland. Although the number of hospital ds in Scotland was only about a tenth of the total for e United Kingdom, Scotland was training about a rd of the medical students—a remarkable achieve- nt. Therefore, if the teaching hospitals were taken t of the regional ambit, the core of the Scottish hospital vice would have gone. He had therefore tried to me an alternative scheme with the same general aim safeguarding the position of medical education. He ought that the universities would accept generally t the Bill would enable them to discharge their ponsibilities to their own satisfaction. The Bill laid lear duty on the responsible Minister, and through n on the regional boards and boards of management, make available all the necessary facilities for clinical ching and research. When the regional board drew its scheme for the constitution of boards of manage- ents for hospitals it must consult the university to tablish in which hospitals teaching was to be carried , and on the boards of these hospitals the university ust be represented. There would be a medical educa- on committee in each region to advise the board on all atters relating to the hospital services which affected edical education.

The Bill also provided that boards of management, hether of teaching or non-teaching hospitals, would in e first place retain the endowments of their hospital. the new conditions, when many endowments would ot be needed for their original purpose, some review d reallocation was necessary.

Turning to the local health authorities, Mr. Westwood id that their most important function in the future was social side of health care. This was linked with eir broad duties in connexion with the control of fectious diseases. But they had yet another part to lay in the new service. They represented the con- mers, and for this reason they nominated a third of the embers of the executive councils responsible for the eneral-practitioner services. They would also be con- ulted in the appointment of regional boards and boards f management. In framing the regulations under the Bill it would be the earnest desire of the Government to ave full and free discussions with all the interests con- erned, including the organisations of professional men nd women on whose good will and coöperation the uccess of the health service depended.

THE DEBATE

On behalf of the Opposition Mr. J. S. C. **REID** moved n amendment calling for the rejection of the Bill. t put, he declared, too much power in the hands of the inister and left too little scope for initiative and esponsibility on the part of those who were to run the ervice. Almost all the objectionable provisions which njured the patient by undermining the independence of he medical profession centred on the control of the istribution of doctors, yet the average number of people er general practitioner in Scotalnd was 2000, and only 3 areas could be held to be underdoctored. He was mazed that the teaching hospitals had been treated so much less favourably than in the English Bill and for such flimsy reasons. In England the teaching hospitals through their board of governors were in direct contact with the Minister and with the universities, and kept their endowments. In Scotland in future they would only have boards of management and become mere units in a large scheme, while all their endowments were subject o reallocation.

Sir **JOHN GRAHAM KERR** dubbed the Bill the product of diligent artificers working in the murky recesses of a Whitehall office. At present the finest material was coming into the science of medicine. It was the leaders of the profession who were training it. But they did that work because they realised that it would give them an opportunity to inspire their students, and that they would be paid back, indirectly, by forming a great clientele of practitioners who would come back to consult them later on. The type of man who went into a university, or other school of medicine, and later into the profession, was not the sort of person who was interested in a salaried service in which promotion went merely by seniority. If the Bill were passed into law it would be one of the greatest disasters to the health of the people.

Colonel **WALTER ELLIOT** held that the Bill would be a better one if it followed Scottish traditions instead of trailing at the heels of the English Bill, or indeed of its Welsh instigator. Why had the Hetherington report been thrown overboard and this new parentless institution brought in? In carrying out the Highlands and Islands Service it had not been found necessary to nationalise a single hospital.

In summing up, Mr. G. **BUCHANAN**, joint Under-Secretary of State, said they had sought to avoid the difficulty of defining a teaching hospital; and to leave out of this new experiment 230 hospitals—almost half the total—would make a sham of the whole scheme. They had been criticised for not giving enough power to local government. But nowadays it was said that there must be some form of workers' control. And here the workers were the doctors. They must be given some rights and on the whole they did not want the local-authority set-up.

Petition against Vivisection

In the House of Commons on Dec. 12 Mr. **PETER FREEMAN** presented a humble petition protesting against the practice of vivisection on live animals with or without anæsthetics. The petition, signed by 1972 petitioners, declared vivisection to be morally unjustifiable, scientifically useless, dangerous, and demoralising to the community, and earnestly prayed that the House would pass a Bill withdrawing the sanction of the law from its practice.

QUESTION TIME

Psychiatrists on Selection Boards

Mr. **GEOFFREY COOPER** asked the Secretary of State for War on what grounds a decision had been made to remove qualified psychologists and psychiatrists from officer selection boards, in view of the fact that these experts devised the successful techniques now in use.—Mr. F. J. **BELLENGER** replied: The function of the Service psychiatrist is to advise the executive authorities on matters of mental health and adjustment. It is open to the presidents of officer selection boards to consult the Service psychiatrists, or specialists in other branches of the medical profession, if they find reason to do so. Psychiatrists and psychologists are both consulted in the formulation of the technique adopted by the boards.

Mr. **COOPER**: Have psychologists and psychiatrists been dropped? The answer does not make that point clear.—Mr. **BELLENGER**: They have not been dropped, but they are not now necessarily members of these selection boards. —Mr **COOPER** Does the Minister know that the presence of psychologists and psychiatrists on these boards during the war won the confidence of the serving men, and increased the number of other ranks who applied for commissions? —Mr. **BELLENGER**: As long as the services of psychiatrists are made available, if necessary, that is all, I think, my hon. friend can ask for. I may tell him that there was a good deal of objection to these psychiatrists among the men.

Brigadier A. H. **HEAD**: Is the Minister aware that all other ranks did not share the view of the hon. member, and that some of them referred to the psychiatrists as "trick cyclists"?—Mr. **COOPER**: Was that on the part of senior officers or other ranks?—Mr. **BELLENGER**: I am well aware of that, but I think we ought to get this question in its correct perspective. Psychiatrists were of great value in many cases.

Release of R.A.M.C. Officers Serving in India

Major E. A. H. **LEGGE-BOURKE** asked the Secretary of State for War if he would state, by age and service groups, the number of R.A.M.C. officers now serving in the India Command whose release had been compulsorily deferred distinguishing specialist and general duties officers.—Mr. **BELLENGER** replied: Up to Nov. 15 there has been no case of compulsory deferment of either a specialist or a general-duty R.A.M.C. officer during the last three months.

Supersonic Sound and Health of Workers

Mr. C. W. DUMPLETON asked the Lord President of the Council whether research was proceeding into the possible effects of supersonic sound upon the health of workers in the manufacture of turbo-jet aero-engines.—Mr. HERBERT MORRISON replied : The Medical Research Council are making preliminary inquiries on the subject, and when these are completed consideration will be given to the question of a programme of research.

Board of Control

Mr. R. SARGOOD asked the Minister of Health what was the annual cost to the National Exchequer of the Board of Control of Mental Hospitals and Institutions.—Mr. A. BEVAN replied : *The net cost of the board for 1945–46 was £237,000, of which £58,000 was in respect of the board's office, the remainder being the cost of grants for ex-Service mental patients and the cost of the State institutions for mental defectives of dangerous propensities.*

Social Surveys

In the course of a reply, Mr. GLENVIL HALL stated that the staff of Social Survey were engaged on an illness survey *(for the Ministry of Health), a survey of the incidence of deafness in the country (for the Medical Research Council),* and one on the employment of miners with pneumoconiosis (for the M.R.C. and the Ministry of Fuel and Power).

Preparation of Sera

Mr. PETER FREEMAN asked the Home Secretary whether a licence was required where experiments on living animals were claimed to be used for veterinary purposes ; whether he was aware of the unsatisfactory condition of many horses and other animals used for the preparation of sera for such conditions ; whether such institutions were visited by his officers or the police ; and whether he had any record of the number of such institutions.—Mr. CHUTER EDE replied : I am advised that a licence under the Act of 1876 is required for experiments made to discover or test sera to be used for veterinary purposes, but not for procedures undertaken *merely for the production of such sera. Places used solely* for this purpose are neither visited by my inspectors nor registered by my department. The police do not visit them as a matter of routine.

Mass Radiography

Replying to a question, Mr BEVAN stated that nineteen mass radiography units were operating in England and Wales. Up to June 30 approximately 1,111,000 persons were examined, of whom 4200 were diagnosed as suffering from active tuberculous conditions.

Obituary

ANTHONY RICHARD NELIGAN

M.D. LOND., D.T.M. & H.

Dr. A. R. Neligan, who died on Dec. 8 in Birmingham at the age of 68, had been carrying on his consulting work in Droitwich till two days before his death.

Born in Tralee, co. Kerry, the son of Dr. J. W. Neligan, he studied medicine at Barts, where he carried off the Brackenbury scholarship, the Matthews Duncan gold medal, and the Skynner and Burrows prizes. In 1903 he graduated M.B., and he took his M.D. three years later. After holding house-appointments at Barts, he was appointed in 1906 physician to the British legation at Teheran, and the next twenty years he spent in Persia. As British representative on the Persian Sanitary Council he did much to improve the public health of the country. And in a balanced and comprehensive survey of the Persian health services, published in our columns in 1926, he was able to describe the introduction of a public vaccination service, the establishment of a Pasteur institute, and some progress in sanitation.

After leaving Teheran in 1926 he spent over a year visiting rheumatic hospitals, clinics, and spas in Europe and America, and on his return to England he was appointed superintendent of the Red Cross Clinic for Rheumatism, in London. In 1931 he finally settled in Droitwich, where he was appointed physician to the Royal Brine Baths Clinic. A member of the International Society of Medical Hydrology, the International against Rheumatism, and the Royal Society of Dr. Neligan made valuable contributions to cussions on fibrositis and arthritis. He had training for his own specialty, but over and he had a wide background of knowledge, and he all his life a student, reading widely and keeping abreast of advances not only in his own de also in general medicine.

Dr. Neligan leaves a widow, a daughter, and who is also a doctor.

ROBERT LEE MOORE

L.R.C.P.E.

Dr. R. L. Moore died on Nov. 30, at Bangor, co. where he had carried on an extensive practice fo fifty years. Born in Belfast, he was educated the Royal Academical Institution and at the L Institute. In 1890 he took the Scottish Conjoint tion. Closely associated with the Bangor Hospital its beginning as a small cottage hospital, he was governor of the present institution. He was justice of the peace. His fund of stories about old personalities and events was inexhaustible, and h an authority on co. Down folk-lore and dialect. A me of the Royal Ulster Yacht Club and the Bangor club, Dr. Moore was a noted athlete and ass football player in his youth. His wife survives him three daughters and two sons, one of whom, Dr. B. Moore, is clinical pathologist to the Mater [illegible] A third son died in Java while a prisoner-of-war.

Births, Marriages, and Deaths

BIRTHS

BETTS.—On Oct. 28, the wife of Dr. J. W. Betts—a daughter.

BLANSHARD.—On Dec. 11, in London, the wife of Dr. Paul —a daughter.

CLARKE.—On Dec. 11, the wife of Dr. J. G. R. Clarke—a da

COOPER.—On Nov. 18, at Newcastle, the wife of Captain J. R. R.A.M.C., of Darlington—a daughter.

CUTHBERT.—On Dec. 10, in London, the wife of Dr. J. B. C —a son.

DAVIES.—On Dec. 8, in London, the wife of Dr. J. V. S. A. —a son.

DEMPSEY.—On Dec. 10, in London, the wife of Major Dempsey, R.A.M.C.—a son.

DENNISON.—On Dec. 8, at East Grinstead, the wife of Dr. Dennison—a daughter.

DRURY-WHITE.—On Sept. 20, at Maymo, Burma, Dr. Jean White, wife of Mr. Roger de Coverley—a daughter.

GORDON-WILSON.—On Dec. 6, at Guildford, the wife of Dr. Cl Gordon-Wilson—twin daughters.

HALLETT.—On Dec. 11, at Guildford, the wife of Mr. G. S Hallett, F.R.C.S.—a son.

HOLLINS.—On Dec. 9, at Dorchester, the wife of Dr. C. H —a daughter.

HOPKINS.—On Dec. 3, at Ismailia, Egypt, the wife of Philip Hopkins, R.A.M.C.—a daughter.

HOUGHTON.—On Dec. 7, at Leamington Spa, the wife of Dr. Houghton—a son.

IRVINE.—On Dec. 10, at Hove, the wife of Dr. L. C. D. —a daughter.

JACOBS.—On Dec. 9, in London, the wife of Dr. J. J. M. —a son.

MORRISON.—On Dec. 7, at Singapore, the wife of Dr. Hugh —a son.

OWEN.—On Dec. 8, in London, the wife of Dr. M. W. L. —a daughter.

PATON.—On Dec. 8, at Leicester, the wife of Dr. H. O. P —a son.

RIVETT.—On Dec. 8, at Leeds, the wife of Dr. P. A. H. R —a daughter.

ROLFE.—On Dec. 9, at Hampstead, the wife of Dr. D. A. R —a daughter.

SHAW.—On Dec. 8, in London, the wife of Surgeon-Lieutenant J Shaw, R.N.V.R.—a son.

MARRIAGES

HAMLYN—PRATT.—On Dec. 7, at Aldershot, Edward Ham M.B., captain R.A.M.C., to Enid Pratt

HERDMAN—PEARCE.—On Dec. 10, at Harrow-on-the-Hill, J Phipps Herdman, B.M., to Sheila Kathleen Pearce.

REDDINGTON—GOODALL.—On Dec. 7, in London, North Reddington, F.R.C.S., to Kathleen Mary Goodall.

RUFFMAN—CUMBERLEGE.—On Dec. 5, at Newcastle-on-T Alan Ruffman, M.B., to Yvonne Rhoda Cumberlege.

DEATHS

COLLINS.—On Dec. 12, in London, Sir William Job Collins, K.C. M.D., M.S., B.SC. Lond., F.R.C.S., aged 87.

HERON.—On Dec. 7, David Heron, F.R.C.S.I.

MCTURK.—On Dec. 8, at Newton Stewart, James McTurk, L.R.C.

MILNER.—On Dec. 8, at Torquay, Vincent Milner, M.B. Edin

NELIGAN.—On Dec. 8, at Birmingham, Anthony Richard Nelig M.D. Lond., D.T.M.& H., of Droitwich.

WHITTINGDALE.—On Dec. 11, John Flasby Lawrance Whittingd O.B.E., M.B. Camb.

Notes and News

APPEAL TO WOMEN SPECIALISTS

HE Central Medical War Committee is experiencing ulty in securing enough men to meet the requirements e Services and accelerate the release of specialist officers, e demobilisation is lagging far behind that of medical ers generally. At the suggestion of the Minister of Health committee is now appealing for women volunteers, not e the age of 40, qualified in the specialties of gynæcology, thetics, pathology, or radiology, to serve in the Army .A.F. There is at present a special need for gynæcologists ork among the families of Servicemen overseas, particu- y in the B.A.O.R. The period of service for recruits g the Forces in 1947 will be two years, but volunteer ialists above the age of 30 may, if they wish, serve for onths only. Offers should be addressed to the secretary e committee at B.M.A. House, Tavistock Square, W.C.1, in Scotland, to the secretary of the Scottish Central Medical r Committee at 7, Drumsheugh Gardens, Edinburgh.

GAZELLE BOY

VER since Peter the Wild Boy was found walking on all s, climbing trees, and feeding on grass and moss near celin in 1725 and brought to England to be a protégé of rge I and to be exhibited to the nobility as an example one nurtured by a wild beast (in his case a she-bear was the ost popular postulated foster-mother), tales have cropped up intervals about wolf boys, mainly from India, particularly cknow, where a gullible British resident at the Indian urt had many such boys produced for his inspection. Most them were idiots, but at least one had been brought up as impostor.[1] In 1903 a "baboon boy" was captured in uth Africa[2]; but he was described as "remarkably telligent," and so there may be some truth in the suggestion at he had been fostered by a baboon, which, after all, is a imate. But the latest story of the "gazelle boy" from aq, who, from constant practice in running with the herd, as credited with a speed of 40 m.p.h., turns out to be a mplete hoax. When his photograph was published in the ily press some thought they could detect a lighter shade the boy's arm, suggesting that he had worn a shirt. t it appears that the tale was based on the escape and apture of a mentally deficient boy from an asylum in ria.

TWO NEW BRITISH JOURNALS

THE Nutrition Society is to sponsor a new quarterly, the British Journal of Nutrition, and it is hoped that the first number will appear within the next six months. Papers may now be submitted to the chairman of the editorial board, Dr. S. K. Kon, National Institute for Research in Dairying, hinfield, near Reading, Berks. The need for a journal of his kind has been apparent for a long time, and there will be o lack of excellent material.

The newly founded Society for General Microbiology, f which Sir Alexander Fleming, F.R.S., is president, will ue the first number of its new *Journal of General Microbiology* in January. The society was founded for the study of acteria, micro-fungi, microscopic algæ, protozoa, and viruses, cluding their structure, development, physiology, nutrition, enetics, cytology, ecology, antibiotic activity, and reaction chemotherapeutic agents. The journal will consist of three mbers in the year and it is hoped to increase that number er. The annual subscription is 50*s*. Papers for publication hould be sent to Dr. A. A. Miles, National Institute for Medical Research, Hampstead, London, N.W.3.

Both journals will be published by the Cambridge University Press, Bentley House, 200, Euston Road, London, N.W.1, o whom all non-editorial correspondence should be addressed.

DISINFESTATION OF AIRCRAFT

THE growth of air travel has added greatly to the difficulties of quarantine precautions. It is important, for example, to prevent mosquitoes infected with the yellow-fever virus from reaching areas, such as India, to which the disease has not yet spread despite the existence there of suitable vectors. Aircraft are now disinfested as a routine almost everywhere he tropics. The method consists in releasing a mist of concentrated insecticide, which permeates the air-space inside the aeroplane without harm to the passengers. Garnham, in East Africa,[1] has shown that, given an exposure of at least fifteen minutes, a number of pyrethrum or D.D.T. preparations are effective; a simple paraffin extract of Kenya pyrethrum (1 lb. to the gallon) is efficient, but, like all pyrethrum preparations, it must be used fresh.

One snag is that mosquitoes may retire into out-of-the-way places, such as the hollow interiors of the wings or behind panelling; but these places can be disinfested by increasing the dose or by directing the sprayer into the blind spaces. Perhaps a more serious risk, to which Garnham draws attention, lies in the incapacity of these mists to penetrate fabrics, so that mosquitoes settling inside coat-sleeves are protected. Moreover, removal and shaking of the coat is not enough, for tests have shown that mosquitoes hidden there resist quite rough handling.

SPANISH INTO ENGLISH

IN a pocket dictionary,[1] appropriately dedicated to Dr. Josep Trueta, Mr. Maurice McElligott, F.R.C.S.I., has provided a convenient tool for doctors who wish to read articles in the original Spanish. Yet it is to be doubted whether those who make this attempt are unduly confounded by the medical terms, many of which are nearly identical with their English equivalents: "ectropión," "metabolismo," and "septicemia" are examples taken at random, though there are several on every page of the book. In a second edition he might omit some of these samples of the lingua franca of medicine in favour of terms and expressions likely to puzzle, even though they have no medical bearing in other contexts. In arrangement and typography the book is thoroughly attractive, and the author's assurance of its accuracy appears in the preface.

BATTLE SCHOOL FOR FIRST-AIDERS

PLAINLY it is impossible to teach first-aid workers the theory behind all they learn. This being so, instruction tends to take the form of rigid dogma, teachers and pupils counting themselves content if the catechism is accurately remembered; and the same is true of the usual formal exercises. Top marks in a test under these conditions is no guarantee of even a passable showing in the rough and tumble of reality. This consideration prompted the founding of the Casualties Union, which is dedicated to realism in training. The union teaches the first-aider to use his intelligence as well as his memory; the training he is offered is based on war-time experience that he can no more identify and treat injuries by the 1, 2, 3 in the little book than can the doctor recognise and relieve the condition of his patients by recall of the classical description in the textbook. The union has been at pains to train actors in the rôle of "casualties," and to make them look the part; the autumn number of the union's journal, for example, contains articles on the faking of flesh wounds and a formula for washable blood. It only remains for the casualty to be found in a realistic environment—on the road, pinned under a beam, or in a smoke-filled room—and the stage is set for a first-class exercise. The aims of the union, whose branches are multiplying in the home counties, will be applauded by all who are interested in better first-aid. The hon. secretary's address is The Bend, Send, Surrey.

University of Cambridge

An election to the Pinsent-Darwin studentship in mental pathology will be made next March. The studentship has an annual value of not less than £225 and is tenable for three years. Applications should be submitted, before Feb. 28, to the secretary, Pinsent-Darwin Studentship, Psychological Laboratory, Cambridge.

University of Sheffield

Dr. Quentin Gibson has been appointed lecturer in physiology in the university.

Royal College of Physicians

Prof. F. C. Bartlett, F.R.S., will deliver the Oliver-Sharpey lectures at 5 P.M. on Tuesday, Jan. 21, and Thursday, Jan. 23. His subject will be the Measurement of Human Skill.

---

[1] See *Lancet*, 1927, i, 984, 1195.
[2] *Ibid.* 1940, i, 863.

[1] Garnham, P. C. C. *E. Afr. med. J.* 1946, 23, 272.

[1] Spanish-English Medical Dictionary. London: H. K. Lewis. Pp. 250. 12*s*. 6*d*.

University of Edinburgh

On Dec. 13 the following degrees were conferred :

M.D.—M. W. Archdall, *L. F. Brown, *E. M. Donaldson, *Jack Greenstein, *A. F. Lang, Tormod Macleod, *I. R. Milne, R. W. G. Ransome-Wallis, †G. D. F. Steele.

M.D. of the Polish School.—A. J. Baranski, J. F. Majeranowski.

M.B., Ch.B.—H. I. O. Armstrong, G. H. Blair, John Calder, G. R. Duffes, J. T. Y. Forrest, Mary G. Forsyth, G. R. C. D. Gibson, A. C. Jacob, Muriel G. James, D. L. Kirk, W. H. Lloyd, J. M. Loughran, N. C. Low, Alexander MacLennan, Jean C. I. Melville, Catherine S. Paterson, J. P. Payne, J. C. Phemister, Kenneth Robertson, C. M. C. Smelt, Anne M. Stewart, I. C. Wilson, J. H. Young.

M.B., Ch.B. of the Polish School.—Bohdan Adamski, Stefan Dyakowski, Mojzesz Gonszor, Adam Jarosz, Antoni Kepinski, Jerzy Klimczynski, Tadeusz Klosowski, J. K. Koziol, J. G. Lipski, Wladyslaw Mitus, Zbigniew Prokopowicz, Anna M. Sokolowska, Mieczyslaw Szamocki, Zdzislaw Teleszynski, Józef Wilczynski, Hanna H. Wozniak, Stefan Wozniak, Witold Zaleski, Wladyslaw Zarski.

* Commended. † Highly commended.

Royal College of Surgeons of England

At an ordinary meeting of the council on Dec. 12, with Sir Alfred Webb-Johnson, the president, in the chair, Mr. R. M. Handfield-Jones, St. Mary's Hospital, was admitted as a member of the court of examiners. Prof. Ian Aird, F.R.C.S.E., British Postgraduate Medical School, was admitted ad eundem to the fellowship.

The Hallett prize was presented to Mr. R. P. Melville (Sydney). Mr. J. G. Turner and Prof. Evelyn Sprawson were elected Charles Tomes lecturers for 1947. Mr. P. H. Mitchiner was appointed editor of the forthcoming college publication.

A gift of 50,000 francs towards the restoration fund was received from the Association française de Chirurgie.

A diploma of membership was granted to E. N. Rees.

Diplomas of fellowship were granted to the following candidates :

A. G. Tresidder, John Penry, D. B. Cater, Thomas Denness, W. G. France, J. A. R. Johnson, C. M. Dransfield, M. A. Margo, J. W. M. Leslie, J. A. Rhind, W. D. Doey, K. H. Taylor, J. A. S. Green, C. A. Jackson, R. G. Robinson, D. H. Thompson, T. H. Cullen, J. S. McConnachie, K. W. Martin, A. J. Walker, F. H. D. Hutter, G. K. Rose, G. E. Stein, L. R. S. Taylor, C E. Drew, H. H. G. Eastcott, Arsen Klidjian, P. C. Watson, T. L. Kennedy, H. W. A. Baron, Ambrose Jolleys, C. O. Fung-Kee-Fung, A. M. Wood, L. L. Bromley, I. A. Alexander, A. H. M. H. Ashoor, C. H. Bartlett, S. K. Burcher, Mortimer Burdman, H. A. Daniels, J. B. Dowe, H. B. Hattam, L. H. Hiranandani, E. S. R. Hughes, Hassan Ibrahim, D. S. Iyer, D. R. Leslie, John Loewenthal, S. D. Loxton, A. B. McCarten, R. J. Manekshe, Raphael Marcus, K. W. Priddis, J. G. Pyper, R. F. Read, W. S. Rees, D. B. Robertson, D. R. Ryder, V. S. Sheth, F. N Street, J. M. Tyler, S. A. Vincent, Muriel C. Waterfall, T. E. Wilson.

Diplomas in anæsthetics were granted jointly with the Royal College of Physicians to the following candidates :

E. F. Adams, S. N. Albert, G. S. Ambardekar, J. D. M. Barton, W. L. Bilsland, R. P. Bliss, N. H. Bloom, R. A. Bowen, D. M. Brown, C. A. Cheatle, H. C. Churchill-Davidson, R. E. W. B. Comerford, R. L. Coulter, J. I. Davies, W. W. Deane, A. G. Doughty, G. L. Evans, Henry Fairlie, D. J. H. Goodhew, Helen E. Gordon, R. W. G. Grindlay, J. R. Hamerton, Godfrey Herington, M. H. W. Holloway, Gordan Houseman, M. S. Howe, J. McN. Inglis, R. G. G. Jones, W. A. Jones, F. M. Lancaster, R. A. Lattey, J. D. Loughrey, T. H. McCall, I. M. McCully, A. I. MacKenzie, Leonard Mather, Julia M. Middleton, Michael Nash, James North, J. R. Odell, H. F. Patrick, A. W. Raffan, G. A. Rawlins, D. F. Rees, G. J. Rees, T. B. L. Roberts, Eleanor H. Russell, L. T. Scott, J. J. Slowe, James Straton, E. I. Tate, W. N. Vellacott, G. L Way, J. H. Willis, F. G. Wood-Smith, D. S. Young.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Dec. 5 Dr. D. M. Lyon was re-elected president. Dr. W. D. D. Small, Dr. L. S. P. Davidson, Dr. J. D. S. Cameron, Dr. H. L. Wallace, Dr. I. G. W. Hill, and Dr. D. K. Henderson were elected to form the council for the ensuing year. Dr. W. D. D. Small was nominated vice-president.

Ophthalmological Society of the United Kingdom

The society's annual congress will be held in Glasgow from March 27 to 29. Rhinology in Relation to Ophthalmology is among the subjects for discussion. The hon. secretary for the congress is Mr. E. F. King, 79, Harley Street, London, W.1.

Cancer Instruction in the United States

A committee of 24 doctors, representing 14 medical schools, has been formed, under the chairmanship of Prof. Frank E. Adair, to advise the National Advisory Cancer Council on the place of cancer in the medical curriculum. The aim is to make courses on the subject more comprehensive and better integrated.

University College Hospital Medical School

The centenary of the first public administration of Europe is to be commemorated in a lecture by Dr. Dawkins on Saturday, Dec. 21, at 4.45 P.M.

British Institute of Radiology

A series of six lectures on the Applications of Physics in Medicine will be given by Prof. W. V. May at the institute at 5 P.M. on successive Wednesdays, Jan. 1.

Prospects for Reablement

Opening a new rehabilitation and occupational centre at Bromley Hospital on Dec. 14, Sir Wilson chief medical officer of the Ministry of Health, said is a need for still more centres, whose staff should inclu almoner or social worker, to coöperate with the Minis Labour's disablement resettlement officer and the empl the general practitioner, *too, must be kept informe* future medical students may receive fuller instructi physiotherapy and reablement. The idea of g practitioner hospitals, linked to larger institutions, h concluded, now been accepted.

Maudsley Hospital Postgraduate Medical School

A course, in two parts, for the diploma in psychol medicine, will be given at the school in the New Year. first part, in January and February, will be concerne the anatomy and physiology of the *nervous* system, e encephalography, biochemistry in relation to the n system, physiological psychology, psychology, and m psychology. The second part, from March to June include lectures on psychiatry, psychopathology, and p therapy, and related biochemical, pathological, genetic, legal, and social questions. Six months' instruction in psychiatry is included, and there w twenty clinical demonstrations in neurology. Applicati enrolment should be made to the dean, 107, Denmarl London, S.E.5.

Call for Blood-donors

Over 12,000 new donors joined the blood-transfusion in the three months up to Oct. 1 ; but nearly 150,000 volunteers are needed. *It is estimated that* 400,000 donations will be *required in* 1947.

Return to *Practice*

The Central Medical War Committee announces th *following have resumed civilian practice :*

Dr. BYRON EVANS, 59, Cathedral Road, Cardiff (Cardiff 938
Dr. F. BASIL KIERNANDER, 78, Wimpole Street, W.1 (W 8874), and 7, Henley Avenue, Iffley, Oxford (Oxford 721

The headquarters and London regional offices c Central Council of Physical Recreation are now at 6, B Square, W.C.2.

Appointments

CASSON, F. R. C., M.B. Lond., D.P.M. : clinical assistant, depa of psychological medicine, National Hospital for N Diseases, Queen Square.

GORDON, ISRAEL, M.D. Edin., M.R.C.P., D.P.H. : deputy Ilford.

GREEN, S. I., M.B. Lond., F.R.C.S. : surgical registrar, King's Hospital, London.

MCKENZIE, PETER, M.B. Glasg., D.P.H. : deputy physician-intendent, City of Glasgow Fever Hospital.

ROBINSON, W. L., M.B. Belf. : resident surgeon, St. Vincent, ward Islands, Colonial Service.

ROSS, G. L. M., M.B Aberd., F.R.C S. : medical officer, Gil Colonial Service.

STENT, LOIS, M.D. Manc., D.BACT. : pathologist, With Hospital.

STRANG, R. A., M.B. Glasg., D.P.H. : deputy M.O.H., Harrow

Purley and District War Memorial Hospital :

GREIG, D. L., M.R.C.S., D.M.R.E. : radiologist.
WARREN, C. P., M.B. Lond., D.C.P. : pathologist.

Royal Infirmary, Sunderland :

COWAN, I. C., B.SC., M.B. Aberd. : M O. i/c of physical medi
KNOWLES, E. W., M.CH. ORTH. Lpool, F.R.C S. : assistant pædic surgeon.
LEVY, H. B. M., M.C., M.S. Durh. F.R.C.S I. : surgeon.
LOWDEN, T. G., B.M. Oxfd, F.R.C.S. : assistant surgeon.
ROSS, J. M. H., M.B. Edin , F.R.C.S.E. : assistant surgeon.
SANFORD, D. A., M.B. Lond., F.R.C.S , M R.C.P. : surgeon.
WEIR, J. A., M.B. Glasg., F.R.C.S.E. : assistant surgeon.

Examining Factory Surgeons :

DAVID, G. E., M.R.C.S. : Ystalyfera, Glam.
DEWHURST, M. S., M.B. Camb. : Havant, Hants.
MCCALLUM, STEWART, L.R.C.P.E. : Leek, Staffs.

PALINDROMIC RHEUMATISM[*]

F. PARKES WEBER
M.D. Camb., F.R.C P.

PALINDROMIC rheumatism is a convenient term for some clinical syndromes of uncertain causation and for component parts of more complicated "compound" syndromes.

Hench and Rosenberg (1944) described thirty-four cases of a "new" recurrent disease of joints and adjacent tissues: multiple afebrile attacks of acute arthritis and periarthritis. In some cases there were also recurring para-arthritic swellings of soft tissues in the neighbourhood, including in a few patients small temporary intracutaneous or subcutaneous nodules. The attacks developed suddenly, generally lasting only a few hours or days, but recurring repeatedly at short or long *irregularly* spaced intervals. They were manifested by pain, swelling, redness, and disability of one (sometimes more than one) small or large joint. Little or no constitutional reaction or abnormality was revealed by laboratory tests; and no significant functional, pathological, or radiographic evidence of disease was found even after scores of attacks, in spite of the transitory presence (in some cases at least) of an acute or subacute inflammatory polymorph exudate in the articular tissues and cavity.

The incidence was about equal in the two sexes. The patients on admission were aged 21–73 (average 42). The age at onset of the disease was 13–68 (average 34·9). The recurrence notably changed its frequency in four patients. The intervals between attacks differed materially in different cases and from time to time in the same case. As already mentioned, usually only one joint was involved in an attack. Almost any joint in the body was liable to be affected. Finger-joints (notably proximal interphalangeal joints) were especially frequently involved, and then, in order of frequency, came wrists, shoulders, knees, toes, and elbows. Tendon sheaths were also occasionally affected by sudden similar attacks.

TERMINOLOGY

Hench and Rosenberg (1944), who introduced the name "palindromic rheumatism," point out that "palindromic" is simply Greek for "recurrent," and they prefer the relatively vague and non-committal word[†] "rheumatism" (as in frequent medical and popular use) to the more exact word "arthritis." Indeed, the symptoms are not absolutely limited to the joints, for there are sometimes pararthritic (para-arthritic or para-articular) swellings and nodules, and the tendon-sheaths—and sometimes bursæ, notably the olecranon bursa (see below)—may be involved.

It seems to me that the term "palindromic rheumatism" might well be used in a wider sense, to include attacks of intermittent or recurrent hydrarthrosis (whether strictly periodic or not), as described by Schlesinger (1899), Garrod (1910), and many others; the term might also be used for some at least of the cases described by Solis-Cohen (1914) in his paper on "angioneural arthroses commonly mistaken for gout or rheumatism," and for Kahlmeter's (1939) attacks of allergic (?) rheumatism. One may note, by the way, that the curious recurrent attacks described under the heading "urticaria tuberosa of Willan" (Nixon 1916) have analogies with angioneurotic œdema and para-articular phenomena of intermittent hydrarthrosis and palindromic rheumatism.

It is true that some of Solis-Cohen's cases were febrile, whereas the attacks in Hench and Rosenberg's patients were afebrile, as were most of the intermittent hydrarthrosis attacks referred to by Garrod and others. Most of the cases of intermittent hydrarthrosis were definitely periodic, whereas the intervals between the attacks in Hench and Rosenberg's cases were irregular. Though the differences between these various classes may be considerable, enough perhaps to separate them roughly into various clinical syndromes, the points of resemblance are, I think, sufficiently marked to justify their collection into various syndrome-groups under one heading, "palindromic rheumatism."

ÆTIOLOGY

Can there be any common ætiological factor in all these cases? There is some resemblance between individual attacks of "palindromic rheumatism" and the acknowledged allergic joint symptoms of "serum disease." Many have noted an analogy with angioneurotic œdema, which a few of the patients also had. Schlesinger (1899) was struck by resemblances between angioneurotic œdema and intermittent hydrarthrosis, and suggested that some cases of intermittent hydrarthrosis were really angioneurotic œdema of synovial membrane. In the families of some patients with palindromic rheumatism (in my enlarged sense) there have been allergic manifestations, such as urticaria, angioneurotic œdema, asthma, and, I think, recurrent vomiting. Apart from allergy in family history, it may be noted that some of Kahlmeter's (1939) patients had urticaria, angioneurotic œdema, asthma, or migraine. It must be admitted that palindromic rheumatism (in my wider and more inclusive sense) is intimately allied to allergy or some process resembling allergy, even if no causal allergens for the attacks have yet been discovered. Focal sepsis has probably been a causal factor in some cases, owing to bacterial allergens being discharged at times into the blood-stream. One may suspect an inborn tendency as a factor in a few cases in which a family history of similar attacks and acknowledged allergic conditions was forthcoming. Frenkel-Tissot (1916) reported that in a group of four sibs, three had had intermittent hydrarthrosis (knee), and the other was subject to periodic attacks of migraine and occasional urticaria.

SYMPTOMS

Garrod (1910) agreed with previous writers in dividing cases of intermittent hydrarthrosis into primary and symptomatic cases:

> "In primary cases the periodic swelling comes on as an isolated event, sometimes after an injury; and the affected joints, which are in the great majority of instances the knees, recover completely or almost completely in the intervals, at any rate in the earlier stages. In symptomatic cases, on the other hand, the affected joints have already been damaged, more or less severely, by antecedent disease, such as the more obstinate forms of gonorrhœal arthritis, or the crippling lesions of many joints commonly classed as rheumatoid arthritis or arthritis deformans. In other respects the cases of the two classes closely resemble each other, and the observation of a series of examples inclines one to the opinion that, as Linberger (1901) maintains, intermittent hydrarthrosis is a phase or symptom of various diseases rather than a disease sui generis."

A woman, aged 67, in hospital at present with old osteo-arthritis and pernicious anæmia, was under my care about 1919 (when she was aged 40) with recurrent, but not periodic, attacks of swelling, stiffness, and pain in the left knee, each attack lasting a few days. The radiologist (Dr. James Metcalfe) suggested "intermittent synovitis."

Garrod (1910) draws attention to abrupt changes in the features sometimes seen, possibly in connexion with therapeutic measures, when the intermittent hydrarthrosis ceases and is resumed after a more or less long pause. The frequency may change, or the attacks may recur on the opposite side of the body. I was once shown an excellent example of such a change (a case of Dr. O. B. Bode). Of concurrent conditions, Garrod writes, pregnancy exercises the most conspicuous influence on the course of intermittent hydrarthrosis. In most recorded instances the articular attacks have ceased during pregnancy, but not always throughout the whole period of pregnancy. In certain cases hydrarthrosis attacks have shown relation to menstrual periods. Attacks have been more severe or less severe when they coincided with menstrual periods.

---

[*] Part of the annual oration at the Reading Pathological Society, Oct. 24, 1946.

[†] Many terms in medical as well as popular use are somewhat vague and, strictly speaking, inexact Thus the term "aortic coarctation" is often used by medical writers to mean stenosis of the aortic isthmus, though it strictly signifies nothing more than aortic stenosis (stenosis of the aortic valves and orifice).

The small temporary pararthritic intracutaneous and subcutaneous nodules, investigated by Hench and Rosenberg in some of their cases, remind me of the little nodules which sometimes suddenly develop and spontaneously disappear in cases of rheumatoid arthritis, and which may represent an early stage of the well-known "chronic necrobiotic subcutaneous nodules of the rheumatoid arthritis type" (Weber 1946), though they become reabsorbed without the development of necrotic foci.

SOME MORE COMPLICATED "COMPOUND" SYNDROMES

Palindromic rheumatism, in my proposed extended sense, is also a convenient term for prominent features of certain more complicated syndromes, which are probably almost unique. I will give two examples.

The first case can be described as one of palindromic rheumatism without permanent changes in or round affected joints; with recurrent (allergic ?) attacks of Ménière's syndrome, without resulting deafness; and with recurrent (allergic ?) attacks of iritis, with pain but without permanent synechiæ or permanent changes in the eyes.

CASE 1.—A man, aged 28, with the above-mentioned complaints, was admitted to hospital on August 6, 1946, for investigation. He had been born in Burma of British parents, and had been married one year—no children.

History.—Seventeen years ago he had begun to have attacks of pain in the hip-joints, especially the right one. The pain had been felt in the joints (rather than about the joints or in the bones), sometimes radiating down the thigh from the affected hip-joint. The pain had been boring and especially sharp on moving. Besides the pain there had been a sensation of stiffness. No local tenderness; no definite periodicity, but on the average about six months' interval between attacks, which had lasted usually a few weeks. Nothing abnormal had been detected on radiography. The attacks had apparently been afebrile and not accompanied by constitutional symptoms. No definite diagnosis seems to have been made. Rest in bed for five months had been at first ordered, but had been followed by no obvious improvement. Rest had therefore not been regularly adopted for treatment. The pain had usually been in the right hip-joint, but sometimes in the left. Both sides had never been affected together. No other joints had ever been involved. Last attack had been about three weeks ago, right more than left hip. Both hip-joints had been affected, but one side had been completely free (after two weeks) before the other had become painful (for a week). Patient does not go to bed for the attacks, though occasionally owing to the pain he has had to rest.

The attacks of *Ménière's syndrome* had never come on at the same time as the joint-pains. The first sharp attack had been twelve years ago, accompanied by vomiting. Patient had woken up one morning unable to sit up or turn over in bed; he had vomited four or five times, but the vomiting had not been accompanied by a sensation of nausea; that attack had lasted thirty-six hours. The next attack had been a few months later. The interval between attacks had varied from a few months to two years up to three or four years ago; but since then the attacks had been more frequent though less severe, excepting for one severe (the last) attack six weeks ago. The average duration of the attacks had been 24–30 hours, but they might last up to three days. No causal factors had been discovered. Prodromal symptoms had been a kind of light-headedness and tinnitus, slight at first b becoming more pronounced as the attack gradually develop There had been no associated deafness either during or af the attacks—hearing not impaired. No associated headach no associated incontinence. Of the vertigo, patient said th his surroundings seemed at first to revolve; but, when h lay down, objects seemed to pass back over his vertex fro the front. The attacks appeared to be relieved by lying fl on the back—? aborted by pilocarpine gr. $^1/_{10}$.

Seven years ago he had developed the first of seven or eigh attacks of *iritis.* That attack had been on the right side an had lasted about eight weeks. Patient had had only on attack on the left side; the two sides had never been affecte simultaneously. The attacks had been accompanied by considerable eye-pain, especially on coming into the light from dark room. They had occurred at about yearly intervals average duration about a month. They had varied in intensit No precipitating factor known. The last attack had bee in January, 1946.

The eye, ear, and joint attacks had never accompanied on another; not more than one of the three kinds had occurre at a time.

Patient's *general health* apart from the above troubles ha been good, and there had been no other serious complain There was nothing in the family history specially bearing o the subject. We heard privately that the family was "delicate.' A sister had recently had pericarditis after "sinusitis" a the age of 23. Patient's mother had died young; caus uncertain. Patient had seen various specialists. A salt-fre diet had not helped. Dr. Norman William Gardener ha always treated patient for his eyes—with atropine ointmen and by "steaming." Dr. Gardener is certain that the ey attacks were definitely iritis, possibly tuberculous. There ha been definite iritic exudate (plastic iritis) but no permanen synechiæ. This iritis had affected only one eye at a tim He cannot remember whether there had been any sluggishnes in pupillary reaction, change in colour of the affected iris, o any inequality of pupils before atropine treatment had bee begun.

On Admission to Hospital.—Height 5 ft. $6^1/_2$ in.; weigh 8 st. 12 lb. Tall, hyposthenic type, rather delicate-looking No evidence of anæmia. Teeth, tongue, tonsils, and throat nothing special. No obvious enlargement of any superficia lymph-glands. No evidence of latent tetany. Cardiovascula system: nil special. Brachial blood-pressure 135/80 mm. Hg Respiratory system: nil special. Abdomen: nil special. N achlorhydria (August 10, 1946). Central nervous system: nil special. Eyes: very slight lateral nystagmus; slight myopia Hearing good on both sides. Nervous reflexes (deep and superficial) normal. Urine: acid; trace albumin; a few hyaline casts. But on another occasion nothing abnormal was found; sp. gr. 1020, acid. No other abnormal urinary symptoms. Radiograms of both hip-joints and of skull (Dr. F. G. Wood, August 6, 1946): nothing abnormal. Blood Wassermann reaction negative (July 17, 1946). Blood-sugar 110 mg. per 100 c.cm. Blood-uric acid (August 10, 1946) 3·2 mg. per 100 c.cm. Sedimentation-rate (August 7, 1946): first hour 6 mm.; two hours 17 mm. (hourly average 7 mm.). Blood-count (August 17, 1946): red cells 4,950,000 per c.mm.; Hb 96%; colour-index 0·97; leucocytes 7000 per c.mm. On August 21, 1946, the leucocytes were 7900 per c.mm. (polymorphs 76%, lymphocytes 23%, eosinophils 1%).

Patient is now under observation at home, apparently at present in good health.

The symptoms in this case are clearly enough defined to constitute a definite triad syndrome, but no other exactly similar case seems to be known. It is difficult to avoid the conclusion that each of the three syndromes constituting this compound triad syndrome is allergic, though no focal sepsis or allergen has been discovered.

Quincke (1921), among the numerous unusual localisations of his angioneurotic œdema, does not seem to have mentioned the internal ear and Ménière's syndrome. Duke (1923) suggested an allergic origin for some cases of Ménière's syndrome. He referred to a man and a woman with definite allergic history in whom Ménière's attacks seem to be caused by certain articles of food. The attacks were relieved by adrenaline and by the voidance of the foods in question; attacks could be produced by eating such foods, or by intracutaneous jection of extracts. Williams (1945, 1946) has recently laborated an allergic explanation, linking Ménière's isease or, rather, syndrome—which he terms endo-mphatic hydrops of the ear—with vasomotor rhinitis, c., as manifestations of "physical allergy" in he head.

In regard to the recurrent attacks of iritis, I think hey are most probably also allergic. Though I know f allergic cataract (so-called dermatological cataract) ccurring in subjects with allergic dermatoses (eczema-rurigo syndrome, with or without asthma, névro-lermite), and of allergic conjunctivitis—e.g., that ssociated with hay-fever—there is apparently no phthalmological literature recording recurrent iritis as n this patient (compare Ridley and Sorsby 1940). If he patient's joint attacks had been "real" (? strepto-occal) rheumatism instead of palindromic rheumatism, he attacks of iritis might have been supposed to be heumatic iritis, and therefore allergic in so far as acute heumatism is now generally supposed to represent an llergic response towards the pathogenic agent of acute heumatism (? some hæmolytic streptococcus or virus). t may be noted, however, that Parry (1939) recorded ecurrent attacks of iridocyclitis in a young woman, pparently allergic and due to hypersensitivity to egg-white.

In short, this case strongly supports Schlesinger's original views of 1899, according to which the condition would be angioneurotic œdema or, as he preferred to call it, hydrops hypostrophos—i.e., recurrent œdema—sometimes of the synovial membrane of a hip-joint, sometimes of one iris, and at other times of one internal ear, the cochlea beginning to be affected before the semicircular canals. The iris attacks, it must be admitted, are rather chronic, but doubtless in some localisations angioneurotic œdema may be relatively chronic. An allergic reaction may doubtless be chronic if there is ersistent action of some known or unknown allergen in an allergic subject. Recurrent acute reactions can give rise to chronic (persistent) changes. I believe that Loeffler's "transitory pulmonary infiltrations with eosinophilia" are nothing else than angioneurotic œdema, but apparently attacks are not always quite so transitory —compare the case of a man, aged 19, with a history of hay-fever, shown by A. Elkeles and N. R. Butler at the Clinical Section of the Royal Society of Medicine on April 12, 1946, as an example of "recurrent transitory pulmonary infiltrations with eosinophilia (chronic type of Loeffler's syndrome)."

The second case is one which the late Lord Dawson discussed with me in 1942 as a puzzling rarity.

CASE 2.—The patient was a tall strong-looking man, aged about 60, who since 1936 had had attacks of swellings of the hands or feet, usually only one side at a time. The forearms, knees, and legs had been similarly affected. Sometimes also there had been sudden enlargement of an olecranon bursa (no evidence of gout discovered). There had also been subcutaneous nodules along the ridge of the ulna from the elbow; these had been situated over the periosteum and not in it, though somewhat adherent to it. Sensation of tightness in an arm, leg, or shoulder had sometimes given warning of an impending attack. The attacks had never been accompanied by fever or definite pain (contrast this with true attacks of gout). The attacks had lasted a few days and slowly passed off.

I saw him during one attack, which was of three or four days' duration and was beginning to subside. Some fingers of both hands were involved, in one hand more than in the other. The skin over the swelling was red and shiny in some parts, but some patches or streaks were pale, as if blood had been driven out of the surface capillaries by the pressure of serous effusion. Patient had also a chronic smooth bony enlargement (not painful or tender) of the upper end of one fibula, which is difficult to explain.

Previous Data.—A symptomless stone in the gall-bladder had been discovered on routine radiography. Liver efficiency was normal. Gastric achlorhydria was reported, but some free acid returned after gastric lavage. Blood-uric acid 3·6 mg. per 100 c.cm. Blood-sugar normal. Radiography showed no articular changes and nothing abnormal in the bones, but the swelling in the fibula had apparently not been examined. Brachial systolic blood-pressure about 130 mm. Hg.

On one occasion an enlarged olecranon bursa had been tapped and had yielded a serous fluid, giving a pure culture of *Staph. aureus*. No definite evidence of allergy had been discovered by skin tests. One antrum was opaque and had been cleared and curetted for a polypoid condition, but that had had no effect on patient's "attack." A pure growth of *Staph. aureus* had been obtained from the antrum. 'Atophan' had seemed to diminish the attacks at first, but not later.

The attacks had never laid the patient up, but if his fingers had been much swollen during an attack he could hardly use them, and could not write. He took an ordinary diet, as he had found that diet made no difference. He had also left off taking dilute hydrochloric acid with meals, as he thought that also had made no difference. While he had been in South Africa he had remained free from attacks; but, after he had left, they had begun again. Exposure to cold had sometimes definitely brought on an attack.

This case seems to come half-way between palindromic rheumatism and angioneurotic œdema. According to Schlesinger's views of 1899 the patient would be suffering from recurrent angioneurotic œdema (or hydrops hypostrophos, as he called it) of the peri- and para-arthritic tissues of his fingers and limbs and notably sometimes of the synovial lining and wall of one of his olecranon bursæ. The appearance of subcutaneous nodules over the ulnar ridge from the elbow downwards, as in some cases of rheumatoid arthritis, is a feature of the case (cf. Weber 1946). The swelling of the upper end of one fibula is unexplained.

SUMMARY

In spite of obvious objections which might be raised by the fastidious in nomenclature, it is convenient to retain the rather loose term "palindromic rheumatism" proposed by Hench and Rosenberg (1944). Perhaps, however, it would be better to enlarge the scope of the term, to include nearly related syndromes, such as intermittent hydrarthrosis (hydrops articulorum intermittens), which Schlesinger (1899) suggested was a recurrent angioneurotic œdema (hydrops hypostrophos he termed it) of the synovial membrane and soft parts *of joints*.

Palindromic rheumatism, in the extended sense that I propose, constitutes also a convenient term for the central features of certain more complicated ("compound") syndromes, two remarkable examples of which are described.

I am indebted to Dr. E. Schwarz for permission to publish the record of case 1.

REFERENCES

Duke, W. W. (1923) *J. Amer. med. Ass.* 81, 2179.
Frenkel-Tissot, H. C. (1916) *Z. exp. Path. Ther.* 18, 118.
Garrod, A. E. (1910) *Quart. J. Med.* 3, 207.
Hench, P. S., Rosenberg, E. F. (1944) *Arch. intern. Med.* 73, 293.
Kahlmeter, G. (1939) *Acta med. scand.* 102, 432.
Linberger, A. 1901) *Beitr. klin. Chir.* 30, 299.
Nixon, J. A. (1916) *Quart. J. Med.* 9, 245.
Parry, T. G. W. (1939) *Brit. med. J.* ii, 396.
Quincke, H. I. (1921) *Med. Klinik*, 17, 674, 705, 741.
Ridley, F., Sorsby, A. (1940) Modern Trends in Ophthalmology. London, p. 3.
Schlesinger, H. (1899a) *Mitt. Grenzgeb. Med. Chir.* 5, 441.
— (1899b) *Münch. med. Wschr.* 46, 1137 (see also *Brit. med. J.* 1899, ii, epitome p. 69).
Solis-Cohen, S. (1914) *Amer. J. med. Sci.* 147, 228.
Weber, F. P. (1946) Rare Diseases and Some Debatable Subjects, London, pp. 31, 48.
Williams, H. L. (1945) *Proc. Mayo Clin.* 20, 373.
— (1946) *Ibid*, 21, 58 (see also *Brit. med. J.* 1946, ii, 127).

Postscript.—An elderly medical friend told me of his recent experience. He had a slight "cold" accompanied by cough and slight sore throat. About a week later he was suddenly attacked by sharp pain and swelling therapeutic measures, when the intermittent hydrarthrosis ceases and is resumed after a more or less long pause. The frequency may change, or the attacks may recur on the opposite side of the body. I was once shown an excellent example of such a change (a case of Dr. O. B. Bode). Of concurrent conditions, Garrod writes, pregnancy exercises the most conspicuous influence on the course of intermittent hydrarthrosis. In most recorded instances the articular attacks have ceased during pregnancy, but not always throughout the whole period of pregnancy. In certain cases hydrarthrosis attacks have shown relation to menstrual periods. Attacks have been more severe or less severe when they coincided with menstrual periods.

The small temporary pararthritic intracutaneous and subcutaneous nodules, investigated by Hench and Rosenberg in some of their cases, remind me of the little nodules which sometimes suddenly develop and spontaneously disappear in cases of rheumatoid arthritis, and which may represent an early stage of the well-known "chronic necrobiotic subcutaneous nodules of the rheumatoid arthritis type" (Weber 1946), though they become reabsorbed without the development of necrotic foci.

SOME MORE COMPLICATED "COMPOUND" SYNDROMES

Palindromic rheumatism, in my proposed extended sense, is also a convenient term for prominent features of certain more complicated syndromes, which are probably almost unique. I will give two examples.

The first case can be described as one of palindromic rheumatism without permanent changes in or round affected joints; with recurrent (allergic ?) attacks of Ménière's syndrome, without resulting deafness; and with recurrent (allergic ?) attacks of iritis, with pain but without permanent synechiæ or permanent changes in the eyes.

CASE 1.—A man, aged 28, with the above-mentioned complaints, was admitted to hospital on August 6, 1946, for investigation. He had been born in Burma of British parents, and had been married one year—no children.

History.—Seventeen years ago he had begun to have attacks of pain in the hip-joints, especially the right one. The pain had been felt in the joints (rather than about the joints or in the bones), sometimes radiating down the thigh from the affected hip-joint. The pain had been boring and especially sharp on moving. Besides the pain there had been a sensation of stiffness. No local tenderness; no definite periodicity, but on the average about six months' interval between attacks, which had lasted usually a few weeks. Nothing abnormal had been detected on radiography. The attacks had apparently been afebrile and not accompanied by constitutional symptoms. No definite diagnosis seems to have been made. Rest in bed for five months had been at first ordered, but had been followed by no obvious improvement. Rest had therefore not been regularly adopted for treatment. The pain had usually been in the right hip-joint, but sometimes in the left. Both sides had never been affected together. No other joints had ever been involved. Last attack had been about three weeks ago, right more than left hip. Both hip-joints had been affected, but one side had been completely free (after two weeks) before the other had become painful (for a week). Patient does not go to bed for the attacks, though occasionally owing to the pain he has had to rest.

The attacks of *Ménière's syndrome* had never come on at the same time as the joint-pains. The first sharp attack had been twelve years ago, accompanied by vomiting. Patient had woken up one morning unable to sit up or turn over in bed; he had vomited four or five times, but the vomiting had not been accompanied by a sensation of nausea; that attack had lasted thirty-six hours. The next attack had been a few months later. The interval between attacks had varied from a few months to two years up to three or four years ago; but since then the attacks had been more frequent though less severe, excepting for one severe (the last) attack six weeks ago. The average duration of the attacks had been 24–30 hours, but they might last up to three days. No causal factors had been discovered. Prodromal symptoms had been a kind of light-headedness and tinnitus, slight at first but becoming more pronounced as the attack gradually developed. There had been no associated deafness either during or after the attacks—hearing not impaired. No associated headache; no associated incontinence. Of the vertigo, patient said that his surroundings seemed at first to revolve; but, when he lay down, objects seemed to pass back over his vertex from the front. The attacks appeared to be relieved by lying flat on the back—? aborted by pilocarpine gr. $^1/_{10}$.

Seven years ago he had developed the first of seven or eight attacks of *iritis*. That attack had been on the right side and had lasted about eight weeks. Patient had had only one attack on the left side; the two sides had never been affected simultaneously. The attacks had been accompanied by considerable eye-pain, especially on coming into the light from a dark room. They had occurred at about yearly intervals; average duration about a month. They had varied in intensity. No precipitating factor known. The last attack had been in January, 1946.

The eye, ear, and joint attacks had never accompanied one another; not more than one of the three kinds had occurred at a time.

Patient's *general health* apart from the above troubles had been good, and there had been no other serious complaint. *There was nothing in the family history specially bearing on the subject.* We heard privately that the family was "delicate." A sister had recently had pericarditis after "sinusitis" at the age of 23. Patient's mother had died young; cause uncertain. Patient had seen various specialists. A salt-free diet had not helped. Dr. Norman William Gardener had always treated patient for his eyes—with atropine ointment and by "steaming." Dr. Gardener is certain that the eye attacks were definitely iritis, possibly tuberculous. There had been definite iritic exudate (plastic iritis) but *no permanent* synechiæ. This iritis had affected only one eye at a time. He cannot remember whether there had been any sluggishness in pupillary reaction, change in colour of the affected iris, or any inequality of pupils before atropine treatment had been begun.

On Admission to Hospital.—Height 5 ft. $6^1/_2$ in.; weight 8 st. 12 lb. Tall, hyposthenic type, rather delicate-looking. No evidence of anæmia. Teeth, tongue, tonsils, and throat: nothing special. No obvious enlargement of any superficial lymph-glands. No evidence of latent tetany. Cardiovascular system: nil special. Brachial blood-pressure 135/80 mm. Hg. Respiratory system: nil special. Abdomen: nil special. No achlorhydria (August 10, 1946). Central nervous system: nil special. Eyes: very slight lateral nystagmus; slight myopia. Hearing good on both sides. Nervous reflexes (deep and superficial) normal. Urine: acid; trace albumin; a few hyaline casts. But on another occasion nothing abnormal was found; sp. gr. 1020, acid. No other abnormal urinary symptoms. Radiograms of both hip-joints and of skull (Dr. F. G. Wood, August 6, 1946): nothing abnormal. Blood Wassermann reaction negative (July 17, 1946). Blood-sugar 110 mg. per 100 c.cm. Blood-uric acid (August 16, 1946) 3·2 mg. per 100 c.cm. Sedimentation-rate (August 7, 1946): first hour 6 mm.; two hours 17 mm. (hourly average 7 mm.). Blood-count (August 17, 1946): red cells 4,950,000 per c.mm.; Hb 96%; colour-index 0·97; leucocytes 7000 per c.mm. On August 21, 1946, the leucocytes were 7900 per c.mm. (polymorphs 76%, lymphocytes 23%, eosinophils 1%).

Patient is now under observation at home, apparently at present in good health.

The symptoms in this case are clearly enough defined to constitute a definite triad syndrome, but no other exactly similar case seems to be known. It is difficult to avoid the conclusion that each of the three syndromes constituting this compound triad syndrome is allergic, though no focal sepsis or allergen has been discovered.

Quincke (1921), among the numerous unusual localisations of his angioneurotic œdema, does not seem to have mentioned the internal ear and Ménière's syndrome. Duke (1923) suggested an allergic origin for some cases of Ménière's syndrome. He referred to a man and a woman with definite allergic history in whom Ménière's attacks seem to be caused by certain articles of food. The attacks were relieved by adrenaline and by the roidance of the foods in question; attacks could be produced by eating such foods, or by intracutaneous jection of extracts. Williams (1945, 1946) has recently aborated an allergic explanation, linking Ménière's isease or, rather, syndrome—which he terms endo-mphatic hydrops of the ear—with vasomotor rhinitis, c., as manifestations of "physical allergy" in he head.

In regard to the recurrent attacks of iritis, I think hey are most probably also allergic. Though I know f allergic cataract (so-called dermatological cataract) ccurring in subjects with allergic dermatoses (eczema-rurigo syndrome, with or without asthma, névrolermite), and of allergic conjunctivitis—e.g., that ssociated with hay-fever—there is apparently no phthalmological literature recording recurrent iritis as n this patient (compare Ridley and Sorsby 1940). If he patient's joint attacks had been "real" (? streptococcal) rheumatism instead of palindromic rheumatism, he attacks of iritis might have been supposed to be heumatic iritis, and therefore allergic in so far as acute heumatism is now generally supposed to represent an llergic response towards the pathogenic agent of acute heumatism (? some hæmolytic streptococcus or virus). t may be noted, however, that Parry (1939) recorded ecurrent attacks of iridocyclitis in a young woman, pparently allergic and due to hypersensitivity to egg-white.

In short, this case strongly supports Schlesinger's riginal views of 1899, according to which the condition would be angioneurotic œdema or, as he preferred to all it, hydrops hypostrophos—i.e., recurrent œdema—sometimes of the synovial membrane of a hip-joint, ometimes of one iris, and at other times of one internal ar, the cochlea beginning to be affected before the emicircular canals. The iris attacks, it must be admitted, re rather chronic, but doubtless in some localisations angioneurotic œdema may be relatively chronic. An llergic reaction may doubtless be chronic if there is persistent action of some known or unknown allergen in an allergic subject. Recurrent acute reactions can give rise to chronic (persistent) changes. I believe that Loeffler's "transitory pulmonary infiltrations with eosinophilia" are nothing else than angioneurotic œdema, but apparently attacks are not always quite so transitory—compare the case of a man, aged 19, with a history of hay-fever, shown by A. Elkeles and N. R. Butler at the Clinical Section of the Royal Society of Medicine on April 12, 1946, as an example of "recurrent transitory pulmonary infiltrations with eosinophilia (chronic type of Loeffler's syndrome)."

The second case is one which the late Lord Dawson discussed with me in 1942 as a puzzling rarity.

CASE 2.—The patient was a tall strong-looking man, aged about 60, who since 1936 had had attacks of swellings of the hands or feet, usually only one side at a time The forearms, knees, and legs had been similarly affected. Sometimes also there had been sudden enlargement of an olecranon bursa (no evidence of gout discovered). There had also been subcutaneous nodules along the ridge of the ulna from the elbow; these had been situated over the periosteum and not in it, though somewhat adherent to it. Sensation of tightness in an arm, leg, or shoulder had sometimes given warning of an impending attack. The attacks had never been accompanied by fever or definite pain (contrast this with true attacks of gout). The attacks had lasted a few days and slowly passed off.

I saw him during one attack, which was of three or four days' duration and was beginning to subside. Some fingers of both hands were involved, in one hand more than in the other. The skin over the swelling was red and shiny in some parts, but some patches or streaks were pale, as if blood had been driven out of the surface capillaries by the pressure of serous effusion. Patient had also a chronic smooth bony enlargement (not painful or tender) of the upper end of one fibula, which is difficult to explain.

Previous Data.—A symptomless stone in the gall-bladder had been discovered on routine radiography. Liver efficiency was normal. Gastric achlorhydria was reported, but some free acid returned after gastric lavage. *Blood-uric acid* 3 6 mg. per 100 c.cm. Blood-sugar normal. Radiography showed no articular changes and nothing abnormal in the bones, but the swelling in the fibula had apparently not been examined. Brachial systolic blood-pressure about 130 mm. Hg.

On one occasion an enlarged olecranon bursa had been tapped and had yielded a serous fluid, giving a pure culture of *Staph. aureus*. No definite evidence of allergy had been discovered by skin tests. One antrum was opaque and had been cleared and curetted for a polypoid condition, but that had had no effect on patient's "attack." A pure growth of *Staph. aureus* had been obtained from the antrum. 'Atophan' had seemed to diminish the attacks at first, but not later.

The attacks had never laid the patient up, but if his fingers had been much swollen during an attack he could hardly use them, and could not write. He took an ordinary diet, as he had found that diet made no difference. He had also left off taking dilute hydrochloric acid with meals, as he thought that also had made no difference. While he had been in South Africa he had remained free from attacks; but, after he had left, they had begun again. Exposure to cold had sometimes definitely brought on an attack.

This case seems to come half-way between palindromic rheumatism and angioneurotic œdema. According to Schlesinger's views of 1899 the patient would be suffering from recurrent angioneurotic œdema (or hydrops hypostrophos, as he called it) of the peri- and para-arthritic tissues of his fingers and limbs and notably sometimes of the synovial lining and wall of one of his olecranon bursæ. The appearance of subcutaneous nodules over the ulnar ridge from the elbow downwards, as in some cases of rheumatoid arthritis, is a feature of the case (cf. Weber 1946). The swelling of the upper end of one fibula is unexplained.

SUMMARY

In spite of obvious objections which might be raised by the fastidious in nomenclature, it is convenient to retain the rather loose term "palindromic rheumatism" proposed by Hench and Rosenberg (1944). Perhaps, however, it would be better to enlarge the scope of the term, to include nearly related syndromes, such as intermittent hydrarthrosis (hydrops articulorum intermittens), which Schlesinger (1899) suggested was a recurrent angioneurotic œdema (hydrops hypostrophos he termed it) of the synovial membrane and soft parts of joints.

Palindromic rheumatism, in the extended sense that I propose, constitutes also a convenient term for the central features of certain more complicated ("compound") syndromes, two remarkable examples of which are described.

I am indebted to Dr. E. Schwarz for permission to publish the record of case 1.

REFERENCES

Duke, W. W. (1923) *J. Amer. med. Ass.* 81, 2179.
Frenkel-Tissot, H. C. (1916) *Z. exp. Path. Ther.* 18, 118.
Garrod, A. E. (1910) *Quart. J. Med.* 3, 207.
Hench, P. S., Rosenberg, E. F. (1944) *Arch. intern. Med.* 73, 293.
Kahlmeter, G. (1939) *Acta med. scand.* 102, 432.
Linberger, A. (1901) *Beitr. klin. Chir.* 30, 299.
Nixon, J. A. (1916) *Quart. J. Med.* 9, 245.
Parry, T. G. W. (1939) *Brit. med. J.* ii, 396.
Quincke, H. I. (1921) *Med. Klinik*, 17, 674, 705, 741.
Ridley, F., Sorsby, A. (1940) Modern Trends in Ophthalmology, London, p. 8.
Schlesinger, H. (1899a) *Mitt. Grenzgeb. Med. Chir.* 5, 441.
— (1899b) *Münch. med. Wschr.* 46, 1137 (see also *Brit. med. J.* 1899, ii, epitome p. 69).
Solis-Cohen, S. (1914) *Amer. J. med. Sci.* 147, 228.
Weber, F. P. (1946) Rare Diseases and Some Debatable Subjects, London, pp. 31, 48.
Williams, H. L. (1945) *Proc. Mayo Clin.* 20, 373.
— (1946) *Ibid*, 21, 58 (see also *Brit. med. J.* 1946, ii, 127).

Postscript.—An elderly medical friend told me of his recent experience. *He had a slight "cold" accompanied* by cough and slight sore throat. About a week later he was suddenly attacked by sharp pain and swelling in the left patellar bursa, accompanied by local heat and redness, with slight fever. He did not stop in bed, and in a week's time he felt quite well again. Then, however, he developed tenosynovitis about the left ankle, which gradually passed off. He had since early life been subject to migraine-like attacks, though not unilateral. With this exception he had enjoyed good health. As a young man he had had tenosynovitis in the wrist from fencing, and on the inner side of the knee when learning to ride. In this instance I suggest that the bursal swelling in front of the knee and the tenosynovitis were local allergic-like phenomena of the nature of angio-neurotic œdema. He may have become hypersensitive towards some "agent" introduced by the "cold."

Slight traumata may be supposed to act locally by causing the formation of some histamine-like substance, which *in hypersensitive subjects* produces a local œdematous inflammatory reaction and, if the process be frequently repeated, chronic fibrous thickening, as manifested in the permanently thickened bursa of "housemaid's knee," thickening of the olecranon bursa, and the chronic changes of Dupuytren's contraction and Landouzy's *acquired form of "camptodactylia."*

BODILY CHANGES DURING ABREACTION

ROBERT L. MOODY
M.B. Lond., D.P.M.
REGISTRAR, DEPARTMENT OF PSYCHOLOGICAL MEDICINE, GUY'S HOSPITAL; PSYCHIATRIST (E.M.S.), WOODSIDE HOSPITAL, LONDON

WHEN a traumatic experience is dissociated from normal consciousness it forms an unconscious emotionally charged complex. There is a natural tendency for such a complex to erupt into consciousness and, by so doing, to cause such symptoms as hysterical attacks and battle dreams. These symptoms are due to repetitions, more or less complete, of the original incident; and it is by such repetitions that the emotional charge is gradually dissipated until a point is reached where the experience becomes acceptable to consciousness and the symptoms subside. Often, however, spontaneous recovery does not occur, and the emotional charge has to be artificially reduced. This is usually done by abreaction under narcosis.

The essence of abreaction is that, with conscious control in abeyance, an uninhibited reliving of the traumatic incident can occur. It is found that the reliving process, once begun, proceeds automatically and is accompanied by full expression of the emotions and at least partial repetition of the bodily movements associated with the original incident. Thus it differs fundamentally from the mere recall of a forgotten event. Moreover, observation shows it to be, in many respects, an extraordinarily faithful repetition of the original incident. These complexes, therefore, may be described as psychosomatic experiences which, by reason of their being dissociated from normal consciousness, have remained in the unconscious, unchanged—like food that the stomach cannot digest. The result is that, when they reappear in consciousness, they may do so in toto in their original form, the experience of the body being repeated as well as that of the mind, at least in so far as the physiological mechanisms of the organism allow. These mechanisms are, however, much more extensive and specific in their field of operation than seems generally to be realised. I have therefore thought it worth while to make a full report of a case of localised specific somatic reaction, while referring to similar cases observed by myself and others to show that this is not a unique phenomenon.

CASE-RECORD

A man, aged 35, was admitted to hospital because of attacks of somnambulism accompanied by aggressive behaviour. He was a good type of Army officer who had had a upbringing in a stable middle-class family. He had nightmares in early childhood, but no instability had suspected by his relations until he had walked in his several times in his last year at a preparatory school. T condition had recurred at the age of 16, when he had been forcibly restrained. After leaving school he had joined th regular Army and gone abroad. Except for a few episodes he had remained well for some years. In 1935, however, he had been admitted to hospital with a minor condition and retained five months because of somnam which had recurred soon after his admission. As a result he had been invalided from the Service in 1936. He h remained nearly symptom-free until he had rejoined th Army in 1940.

During his detention in hospital in 1935 physical methods of various kinds had been used to restrain him. In his frequent nocturnal encounters with a bodyguard set to watch him he had sustained both physical and psychical traumata *while he was in a dissociated state.* These dissociated experiences had remained more or less latent for several years; but, as soon as treatment was undertaken, the strength of the repressive mechanism which had maintained that condition was undermined, and the automatic discharge of those experiences began—i.e., there was a recurrence of somnambulisms in whi he re-enacted (often in a truly alarming manner) the traumatic incidents he had experienced in hospital ten years previously. On one such occasion his hands had been tied behind his back during sleep, as a precautionary measure. Waking in a dissociated state to find himself thus constricted, he had struggled unsuccessfully to free himself. He then had managed to evade his bodyguard and had escaped into the surrounding countryside, from which he had returned a few hours later.

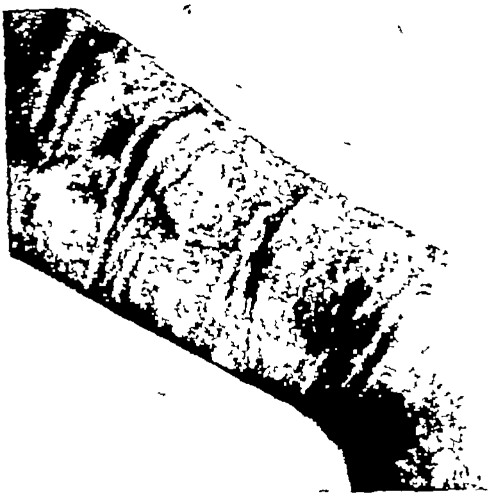
The following detailed account is given of the re-enactment of this incident:

On the night of April 9, 1944, the patient was observed by the nurse on duty to be tossing and turning violently on his bed. He was *holding his hands* behind his back and appeared to be trying to free them from some imaginary constriction. After carrying on in this way for about an hour, he got up, and, with his hands still in the same position, crept stealthily into the hospital grounds. According to orders I had given for the safety of the staff, he was not followed. After twenty minutes he returned in a state of more or less normal consciousness. As he was being put to bed the nurse noticed deep weals like rope marks on each arm, the patient being apparently unaware of their presence. Next day the marks were still visible and were observed by myself and others. The patient had only a vague recollection of what had happened the previous night. By the evening of April 11 the marks had disappeared, except for some residual subcutaneous hæmorrhagic staining.

On the night of April 11 the incident was abreacted under narcosis. At 11.10 P.M. I gave him 5 c.cm. of 'Evipan' intravenously. He slept for fifteen minutes. Then he talked in a meandering way, tossed about on the couch, got on to the floor, and started crawling round the room in a partially dissociated state. Suggestions directed to stimulate the dissociated experience were without effect (this lack of suggestibility was characteristic of him). Soon he returned to normal consciousness without any change in the appearance of his forearms having been observed. He remarked to me that he had "nearly got there"—i.e., reached the dissociated experience—but had then "come awake again."

At 12.15 A.M. I gave him another 3 c.cm. of evipan. He slept for a few minutes and then began reciting poetry. (This was a common prelude to his somnambulism.) Ten minutes later he began to toss and turn on the couch, with his hands behind his back. As he appeared to be *in* a completely dissociated state, I turned the light full on him. I watched him writhing violently for at least three-quarters of an hour. After a few minutes weals appeared on both forearms; gradually these became indented; and finally some fresh petechial hæmorrhages appeared along their course.

Then he got up and crept stealthily through the door into the hospital grounds. I followed him. When he began running, still with his hands behind his back, I lost trace of him in the dark for about ten minutes. When I found him again he was in a partially dissociated state, from which he regained normal consciousness about ten minutes later. He then gave a clear account of everything that had happened and related the incident to his experiences in hospital in India.



Photograph of patient's right forearm with indentations resembling rope marks, which appeared during abreaction under narcosis.

Next morning the marks were still clearly visible and were photographed (see figure).

Possibility of Trickery.—The first time the marks were observed trickery cannot be ruled out; the patient could have tied a piece of rope round his forearms while he was alone in the garden and discarded it on returning to the ward. On the second occasion, however, strict observation during the reappearance of the marks made trickery impossible; so it is difficult to see how the occurrence can be explained in any way other than as a genuine psychosomatic phenomenon. Moreover, for any such trickery there must be a motive, and neither I nor my colleagues could detect any possible motive, conscious or unconscious, for such behaviour. He was a man of excellent character in all respects. In the course of a long and arduous treatment I came to know him well and I have since maintained a social contact.

OTHER CASES

This type of localised somatic manifestation is not so unusual as is generally supposed.

During the abreaction of a man who had been concussed and buried by a fly-bomb a year previously, I found on the left ankle, on which a beam had fallen in the original incident, a swelling which increased the circumference of the ankle by $^1/_2$ in.; and over the left orbit, where he had been struck on the same occasion, an ovoid swelling which increased the circumference of his head by $^1/_4$ in.; at both points he had acute pain for several hours afterwards.

During the abreaction of a merchant seaman, who had been immersed in very cold water for a long time, there appeared (besides much generalised autonomic disturbance) localised ischæmia of the extremities.

In a woman, aged 35, the abreaction of a riding accident, which had happened at the age of 10 years, was followed by petechial hæmorrhages and bruising along the line of the tenth rib on the right side, the side on which she was said to have fractured some ribs. This abreaction was also followed characteristically by several hours of acute pain at the site of the original injury.

I could add to the list from my own limited experience, and no doubt others could add much more. I have heard of striking instances from colleagues, but relatively few cases seem to have been published. It is well known that somatisations of this nature, though not often so dramatically convincing, are fairly common in the course of psycho-analytical treatment.

DISCUSSION

These phenomena show that when an experience, in which there has been somatic as well as acute psychical trauma, is dissociated from normal consciousness, the complex resulting from it may retain the living image, as it were, of the somatic and the psychical experience; and that, when such a complex is discharged into consciousness—even after remaining in a latent (unconscious) state for many years—the somatic component of the original experience may be re-expressed in somatic terms.

The mechanism through which this is effected is obscure, and its final elucidation must remain in the sphere of the neurophysiologist rather than the clinician. But the existence of some such mechanism has been proved beyond doubt by reliable clinical observations and carefully controlled experiments. Unfortunately the best publications relating to this work are nearly all in German, most of them untranslated, with the result that in this country there still exists much scepticism about matters in which perfectly sound scientific proof is not lacking. Skin-blisters, for instance, have been produced hypnotically at *specified points* on the body surface, with the exclusion of all possible sources of error. Localised urticaria of *specified areas* of the body has been produced by similar means; so also have œdema and cutaneous gangrene. Many cases of spontaneous hæmorrhage of a psychogenic nature have been described, and the phenomenon has been subjected to exact scientific demonstration by Schindler (1927), who reviewed the whole subject. The question of religious stigmata has been critically reviewed by Jacobi (1923). One can conclude that neural pathways undoubtedly exist by which psychic contents may be projected on to the body *in a highly specific manner*; and it is reasonable to suppose that, in such cases, the psychic content or image, with its emotional charge, acts as the afferent side of a reflex arc the efferent counterpart of which is supplied by the autonomic nervous system.

Somatisation during abreaction differs from the above-mentioned phenomena in that the emotionally charged image or complex is derived from a previous experience which was in itself psychosomatic; the link between psyche and soma is therefore already in existence. So it is not surprising to find that somatisation during abreaction is relatively common and may occur independently of a well-marked constitutional predisposition.

This finding is of general significance in that such traumatic experiences are not restricted to adult life or to the battlefield. They may occur also in the formative years of early childhood and may involve regions of the body other than the skin and subcutaneous tissues. Though the complexes resulting therefrom may differ in certain important respects from those described in the present case, there is no reason to suppose that there is any material difference in the principles of psychosomatic relationship to which they are subject.

CONCLUSION

These phenomena observed during abreaction demonstrate the particularly intimate association between mind and body in traumatic experiences which have not been accepted by and integrated with consciousness. They also indicate the important part played by the emotional charge, both in maintaining this psychic dissociation and in causing generalised or even highly specific bodily changes.

I wish to thank Dr. Noel Harris, physician in charge, Woodside Hospital, for permission to publish this article.

BIBLIOGRAPHY

Alrutz, S. (1914) *J. Psychol. Neurol., Lpz.* 21, 1.
Bolten, G. C. (1922) *Dtsch. Z. Nervenheilk.* 73, 319.
Doswald, D. C. (1906) *Mech. prakt. Derm.* 43, 634.
Dunbar, H. F. (1946) Emotions and Bodily Changes, New York.
Heyer, G. R. (1925) *Grenzfr. Nerv- u. Seelenleb.* 121 1.
Jacobi, W. (1923) *Ibid*, 114, 1.
Kohnstamm, O. (1912) *Dtsch. Z. Nervenheilk.* 43, 447.
Kreibich, C., Sobotka, P. (1909) *Arch. Derm. Syph., Lpz.* 97, 187.
Schindler, R. (1927) Nervensystem und spontane Blutungen mit besonderer Berücksichtung der hysterischen Ecchymosen, Berlin.

FURTHER OBSERVATIONS ON A VITAMIN-C SURVEY OF MEDICAL STUDENTS

M. Peter Durham
M.A., M.B. Camb.

Gordon E. Francis
Ph.D. Lond.

Arthur Wormall
D.Sc. Leeds

From the Departments of Anatomy and Biochemistry, St. Bartholomew's Hospital Medical College

Earlier reports have been made (Harrison, Mourant, and Wormall 1939, Francis and Wormall 1942) on vitamin-C surveys by saturation tests on the students of St. Bartholomew's Hospital Medical College. The results showed that, whereas the state of "saturation" of these subjects with regard to vitamin C was not significantly different in 1940 from that in 1939, there was a distinctly higher degree of "unsaturation" in 1941. Although the results in 1941 did not suggest that most of the subjects were very seriously deficient in vitamin C, the difference between the 1940 and 1941 results was sufficient to justify a continuation of the survey to determine whether a prolonged shortage of certain fresh fruits during the war would lead to any further increase in the degree of unsaturation of the subjects of our tests. Further observations were therefore made in 1943 and 1944, and the opportunity was taken to study some other aspects of saturation with vitamin C.

The main objects of the investigations described in this paper were (1) to compare the results of the saturation tests in 1943 and 1944 with those of 1939–41; (2) to determine how long any body "reserve" of the vitamin which might be built up by saturation would remain effective, so far as these saturation tests are concerned; (3) to emphasise the seasonal differences and the greater degree of unsaturation in spring compared with other seasons; and (4) to attempt to correlate the results of the saturation tests with observations on follicular hyperkeratosis among the subjects.

Four groups (A, B, C, and D), each originally of 35 students, were selected for these tests, and it was decided to carry out saturation tests on them according to the following scheme:

	GROUPS TESTED			
November, 1943 ..	A	B	—	—
February, 1944 ..	A	—	C	—
May, 1944	A	B	C	D

A slight modification of this scheme was, however, made later, for the results of the tests in February, 1944, indicated that there would be very little point in testing group B in May, 1944. As group A did not appear to "benefit" in February from saturation three months earlier, it seemed highly improbable that group B, saturated like group A in November, 1943, would show any benefit six months after saturation.

EXPERIMENTAL

Subjects.—The subjects, some of whom took part in the 1941 tests, were all students of our medical college. Approximately a third of them had practically all their meals in college in Cambridge during term-time, one or two lived at home, and the rest in lodgings. During the vacations practically all lived at home. They were asked not to take any preparation containing synthetic ascorbic acid during these investigations, but at a later date it was found that a few of the subjects had taken preparations of this type. The results with these individuals, and those on a few subjects who left Cambridge before the completion of their tests, are not included in this report. This explains the differences in the numbers of subjects in the four groups, but as the minimum in the important groups in the final tables is 31, it may be claimed that the results are of statistical value.

Saturation Tests.—These were made by the method of Harris and Abbasy (1937), and full details are given in our earlier publication (Francis and Wormall 1942). The amount of ascorbic acid excreted during a two-hour afternoon period following a dose of 5 mg. of the vitamin (B.D.H.) per lb. of body-weight at 9 A.M. or 10 A.M. was determined, and the subject was considered saturated when he excreted in the two-hour period at least 5 mg. per 14 lb. of body-weight. This is essentially the criterion proposed by Harris and Abbasy, except that their afternoon urine-collection period was two and a quarter hours; these authors also suggested that the number of test doses required beyond the second might be taken as an index of the relative deficiency of the past intake of vitamin C by the individual.

Hair-follicle Tests.—Since it is difficult to measure precisely the extent of hyperkeratosis in any one subject, it was thought desirable that these tests and the chemical tests should be carried out as almost entirely separate investigations. Thus M. P. D., who made the hair-follicle tests, was completely unaware, when he made these tests, of the results of the chemical tests. No comparison of the results was made until the two series were completed, and in this way, it is hoped, a completely unbiased set of results was obtained. Where possible the hair-follicle tests on any one subject were made at about the same time as the start of the saturation tests. In the February series, however, some of the former tests were made rather later (1–4 weeks) than the chemical tests, but from the observations made in this work, and from those of other investigators, it does not seem likely that any significant change in the hyperkeratosis is likely to have taken place during this interval.

Dr. George Graham, at whose suggestion these hair-follicle tests were made, suggested that it would be advisable for the subjects with hyperkeratosis in February and March to receive suitable ointment treatment in readiness for the May observations, but we were not able to adopt this suggestion owing to examinations and the Easter vacation. The possibility that the hyperkeratosis might persist three months after saturation with vitamin C and affect the results of the tests in May is discussed later in this paper.

The back of the thigh has been reported to be the first region of the body to show hyperkeratosis. This site was therefore chosen for an estimate to be made of the degree of hyperkeratosis in each subject. A piece of cardboard with a 2-in. square cut out of it was placed over the back of the thigh just below the fold of the buttock, and the number of diseased hair follicles in the square was counted. If none was visible the whole of the back of the thigh was examined to see whether "occasional" ones were present, and to make sure that the state of the hair follicles in the chosen area was typical. The results were recorded as follows:

+ + + = 13–20 diseased follicles per 2-in. square
+ + = 7–12 " " " " "
+ = 1–6 " " " " "
± = An occasional diseased follicle seen on the leg
— = None
Abs. = Absent or not available for the test

DISCUSSION

The results of the saturation tests and the hyperkeratosis tests for the individual subjects of the various groups are given in tables I, II, and III, with a summary of the saturation-test results in table IV. No tests were made on group B after November, 1943, for reasons given above, and details of the individual results with this group are therefore omitted, but the group results are included in table IV.

In a previous communication (Francis and Wormall 1942) it was shown that a distinct increase in "unsaturation" with regard to vitamin C occurred among our students from July, 1940, to July, 1941, presumably owing to the decreased supplies of oranges and certain other fresh fruits. For this and similar comparisons observations were made where possible at about the same part of each year, for there is a marked seasonal variation in our state of saturation with vitamin C. The results presented in the present paper suggest that the subjects investigated in the latter part of 1943 and the first half of 1944 were not more "unsaturated" than were similar subjects in June and July, 1941. Several of the subjects showed, however, a high degree of unsaturation in 1943 and 1944, requiring 5, 6, or (in one case) 7 large test doses—i.e., 3·5–5 g. of the vitamin—before they were saturated, and these high requirements approach those recorded in the literature for cases of scurvy. Without entering on the vexed question of the relationship between the occurrence of scurvy or subclinical scurvy and a higher degree of unsaturation as assessed by saturation tests it may be noted that some authors—e.g., Paterson and Daynes (1941)—have reported an increase in the incidence of scurvy in this country during the war. Our own surveys have certainly indicated a definite increase in the number of relatively unsaturated individuals during this period.

In these investigations it has been noted that there is a tendency for an individual who is relatively unsaturated in one set of tests to be relatively unsaturated again at

TABLE I—RESULTS OF VITAMIN-C SATURATION TESTS AND HYPERKERATOSIS TESTS IN GROUP A

TABLE II—RESULTS IN GROUP C

TABLE III—RESULTS IN GROUP D (MAY 1944)

TABLE I

Subject	Nov., 1943	Feb., 1944		May, 1944	
	Doses required	Doses required	Hyperkeratosis	Doses required	Hyperkeratosis
1	6	4	–	4	–
2	4	5	–	4	–
3	3	3	–	2	+
4	3	4	+	4	–
5	3	4	±	3	+
6	3	4	–	4	–
7	3	4	++	3	+
8	2	3	–	2	±
9	2	4	+++	4	+
10	2	3	abs.	3	+++
11	2	4	–	3	++
12	2	3	±	2	–
13	2	4	+	5	±
14	2	3	–	2	++
15	2	3	–	2	±
16	2	3	–	1	–
17	2	2	–	1	±
18	1	5	–	4	–
19	1	2	–	2	–
20	1	2	–	2	–
21	1	4	±	3	±
22	1	3	+	2	+
23	1	4	–	2	±
24	1	3	±	2	–
25	1	1	+	2	+
26	1	3	–	4	±
27	1	2	–	2	+
28	1	2	–	2	–
29	1	3	–	2	–
30	1	3	abs.	1	++
31	1	2	+	1	±
32	1	2	++	2	–
33	1	2	–	1	abs.
34	1	1	±	2	+
35	1	1	abs.	1	±
36	1	4	++	3	+
37	1	3	abs.	4	abs.
Aver.	1·76	3·03	.	2·52	..

TABLE II

Subject	Feb., 1944		May, 1944	
	Doses required	Hyperkeratosis	Doses required	Hyperkeratosis
38	6	++	2	++
39	6	–	3	–
40	5	–	1	±
41	5	–	2	–
42	4	–	4	–
43	4	+	3	+
44	4	–	2	–
45	4	±	4	–
46	4	–	4	–
47	4	+	3	±
48	4	–	2	+
49	3	+++	3	+
50	3	–	2	–
51	3	–	3	–
52	3	–	1	–
53	3	±	2	+
54	3	abs.	2	abs.
55	3	–	3	±
56	3	±	2	+
57	3	abs.	4	+++
58	3	±	2	±
59	3	±	3	+
60	2	–	2	–
61	2	abs.	2	+
62	2	–	2	–
63	2	+	1	±
64	2	–	2	–
65	2	–	3	–
66	2	–	4	±
67	2	–	3	–
68	2	+	1	+++
Aver.	3·26	..	2·48	..

TABLE III

Subject	Doses required	Hyperkeratosis
69	7	–
70	6	–
71	6	+++
72	6	+
73	5	–
74	4	+
75	4	++
76	4	+
77	4	+
78	4	+
79	4	±
80	4	–
81	4	–
82	3	+
83	3	+
84	3	+
85	3	+
86	2	+
87	2	±
88	2	–
89	2	–
90	2	–
91	2	±
92	2	abs.
93	2	+
94	2	+++
95	2	–
96	2	+
97	2	–
98	2	+++
99	2	+
100	1	+
101	1	+
102	1	abs.
Aver.	3·09	.

subsequent tests. This might well be expected where the interval between the tests is long, but it seems rather surprising when the interval is only three months. Thus relatively unsaturated subjects of group A who received sufficient ascorbic acid to saturate them in November, 1943, were three months later again relatively unsaturated compared with other members of their group or even compared with individuals who had not received the test doses in November; three months after the second saturation they were again more unsaturated than the others. In group C also, the more unsaturated subjects in February tended to be more unsaturated than the other members of their group three months later. Several reasons might be advanced to explain the tendency of these unsaturated subjects to become unsaturated again very quickly. These individuals might (1) regularly select, by choice or for some other reason, a diet relatively deficient in vitamin C; (2) show a high rate of utilisation or destruction of the vitamin in the tissues; (3) excrete abnormally large amounts in the urine owing to a relatively low renal threshold for ascorbic acid; or (4) show some deficiency in the absorption of the vitamin from the alimentary tract. Of these and other possible explanations the first two appear to be the most feasible, and in the case of a few of our subjects we have satisfied ourselves that the first is probably the factor concerned.

TABLE IV—SUMMARY OF SATURATION RESULTS

Period	Group	No. of subjects	Doses required to give "*saturation*" 1	2	3	4	5	6	7	Aver. no. of doses per subject
Nov., 1943	A	37	20	10	5	1	0	1	0	1·76
	B	23	6	15	2	0	0	0	0	1·83
	A+B	60	26	25	7	1	0	1	0	1·78
Feb., 1944	A	37	3	8	13	11	2	0	0	3·03
	C	31	0	9	11	7	2	2	0	3·26
	A+C	68	3	17	24	18	4	2	0	3·13
May, 1944	A	37	6	16	6	8	1	0	0	2·52
	C	31	4	13	9	5	0	0	0	2·48
	A+C	68	10	29	15	13	1	0	0	2·50
	D	34	3	14	4	8	1	3	1	3·09

Vitamin C, unlike some of the other vitamins—e.g., A, D, and E—is not stored in the ordinary sense in the animal body, but there is undoubtedly, in the tissues of a saturated individual, a "reserve" which might be regarded as a useful "balance" against a future emergency. This need not imply, of course, that saturation with this vitamin is desirable or at all necessary for the proper functioning of the metabolic processes of the body. It is not our intention to discuss at length this question of saturation and the value of the saturation tests as designed by Harris and his colleagues (Harris and Abbasy 1937, Harris 1942); in our experience, however, these tests, because of their simplicity and the clear-cut results, appear to be eminently satisfactory for the purpose for which they were intended. Perhaps it is sufficient to quote Harris (1943): "The purpose of the saturation test is to say whether the intake has been above or below some accepted standard of intake, and if below how much below. Whether saturation is desirable or not is beside the point."

Opinions are divided on the question of the "reserve" value of the vitamin C in the tissues. Zilva (1941) considers that the body ascorbic acid of a saturated animal does not act in any well-marked degree as a reserve, and he does not consider that the body can store this vitamin (cf. also Zilva 1936). Other authorities believe, however, that the reserve may have a real value; and, although it is not our wish to enter this discussion, we decided that it would be of interest in our survey to determine how long any reserve acquired during the saturation tests would remain effective, as judged by later saturation tests.

Information on this point is rather scanty, although Harris (1943), from observations over a period of years, has reached the conclusion that an interval of six months or more between successive saturation tests is sufficient to ensure that the effect of previous saturation in building up the "reserves" has worn off. Atkins (1943) found a difference of only three-quarters of a dose in the saturation-test requirements of two groups, one of which had been saturated four months previously.

The results of our investigations, summarised in table IV, show that the individuals (group A) saturated in November, 1943, were only slightly less unsaturated (0·23 of a test dose on an average) in February, 1944, than were other members of our student population—i.e., they had almost entirely lost in three months any "advantage" from the saturation. The tests made in May showed, however, that those saturated three months previously (groups A and C) were definitely less unsaturated (0·59 of a test dose) than were other individuals (group D). This difference between the results for the two three-month periods can perhaps be explained by the difference between the changes in the state of vitamin-C nutrition of the population, due primarily to seasonal variations in the dietary supply of the vitamin. The period covering these tests was one when we might reasonably expect, from our own earlier observations and from those of other investigators, a distinct increase in the number of doses required to give saturation over the period November to February, with a much smaller increase from February to May. The fact that the latter increase did not arise we attribute largely to the fact that there were a few issues of oranges during the spring of 1944.

The conclusions which might tentatively be reached from the results summarised in table IV are that any *extra* "tissue reserve" of vitamin C resulting from saturating doses will normally be largely lost by the body in the course of three months or less, if the dietary intake of the vitamin over this period is insufficient to meet the body requirements. Where the dietary intake is adequate there may be retention of part of the "reserve" for over three months. Perhaps it is only to be expected that the extra reserve should be dissipated in a "slump" period—i.e., that the more saturated individuals should use or lose vitamin C at a greater rate than those who are less saturated—but it was rather surprising to find that

TABLE V—COMPARISON OF SATURATION TESTS AND HYPERKERATOSIS TESTS IN GROUPS A AND C

Group	February, 1944 Hyperkeratosis reading	No. of subjects	Saturation tests: Doses required 1	2	3	4	5	6	Aver. no. of doses per subject	May, 1944 Hyperkeratosis reading	No. of subjects	Saturation tests: Doses required 1	2	3	4	5	Aver. no. of doses per subject
A	−	19	0	6	7	4	2	0	3·1	−	13	1	7	0	5	0	2·7
	±	5	1	0	2	2	0	0	3·0	±	9	3	3	1	1	1	2·3
	+	5	1	1	1	2	0	0	2·8	+	9	0	5	3	1	0	2·6
	++	3	0	1	0	2	0	0	3·3	++	3	1	1	1	0	0	2·0
	+++	1	0	0	0	1	0	0	4·0	+++	1	0	0	1	0	0	3·0
C	−	17	0	6	4	4	2	1	3·3	−	14	1	6	4	3	0	2·6
	±	5	0	0	4	1	0	0	3·2	±	6	2	1	2	1	0	2·3
	+	4	0	2	0	2	0	0	3·0	+	7	0	4	3	0	0	2·4
	++	1	0	0	0	0	0	1	6·0	++	1	0	1	0	0	0	2·0
	+++	1	0	0	1	0	0	0	3·0	+++	2	1	0	0	1	0	2·5

his extra loss was so high. Two groups of subjects, ne in a "saturated" condition and the other with an pparent "deficiency" of about 1200 mg. of ascorbic cid per subject in November, 1943, had both acquired ractically the same degree of unsaturation three months ater, after living on similar diets and under similar onditions. Over this period the previously saturated ndividual had thus used or lost, on an average, 12–15 mg. f ascorbic acid a day (almost half the daily requirement n the League of Nations standard) more than the indi-idual who was not previously saturated. This observa-ion is consistent with the view that the body economy is nore wasteful of its vitamins when they are in good supply.

This question of a reserve produced by large doses of he vitamin is naturally one of practical importance. lthough it is usually possible and more economical to ive protection against scurvy by supplementing a eficient diet with small daily doses of the vitamin, it vould undoubtedly be of interest to know how far these laily doses can be replaced by larger and less frequent nes. Information on this point will be difficult to btain, but Zilva (1941), in a comparison of the data or man and guineapigs, has tentatively suggested that doses of the order of 100 mg. of ascorbic acid, given at intervals of days or even weeks, may effect at least minimal protection against scurvy.

TABLE VI—COMPARISON OF SATURATION TESTS AND HYPERKERATOSIS TESTS IN GROUP D

Hyper-keratosis reading	No. of subjects	May, 1944							Aver. no. of doses per subject
		Saturation tests							
		Doses required							
		1	2	3	4	5	6	7	
–	10	0	5	0	2	1	1	1	3·6
±	3	0	2	0	1	0	0	0	2·7
+	15	2	4	4	4	0	1	0	2·9
++	1	0	0	0	1	0	0	0	4·0
+++	3	0	2	0	0	0	1	0	3·3

The development of follicular hyperkeratosis in individuals with scurvy has been noted by many authors (Nicolau 1918, Wiltshire 1919, Scheer and Keil 1934, Prunty and Vass 1943). Further, Crandon et al. (1940) found that the hyperkeratotic papules appearing in subjects on a diet deficient in vitamin C but not in the other known factors disappeared after the injection of this vitamin. There is, however, evidence that hyperkeratosis may be associated with vitamin-A and other deficiencies. Lowenthal (1933) reports the association of follicular papules with night blindness and xerophthalmia, all of which were cured together by the administration of vitamin A. Scheer and Keil (1934) state that the types of follicular lesions associated with hypovitaminosis A and with scurvy are indistinguishable in their earlier stages, but differentiation can be made at later stages. Frazier and Hu (1936) do not support this view, however, and they conclude that the cases associated with scurvy are due to diets generally deficient in vitamins, particularly vitamin A (cf. also Frazier et al. 1943).

A comparison of the results of our skin-tests with those of the saturation tests for the same subjects (tables I, II, and III) does not show any definite correlation between hyperkeratosis and a deficiency of vitamin C. Thus quite often a subject who required 5, 6, or 7 large doses of the vitamin before he was saturated showed no sign of hyperkeratosis, and conversely some with well-marked hyperkeratosis became saturated at the second or even the first dose of the vitamin. A comparison of the saturation-test requirements of those subjects showing different degrees of hyperkeratosis (cf. tables V, VI, and VII) also gives no indication of a close relationship between "unsaturation" with vitamin C and hyperkeratosis; thus the number of test doses required by subjects showing well-marked hyperkeratosis (++ or +++) usually differed little from the requirement of those showing no hyperkeratosis. Another method of analysis which has been used involves the division of the subjects into two arbitrary groups, "relatively saturated" and "relatively unsaturated," according to the number of test doses required. If those requiring three or more doses of the vitamin are classified as "unsaturated" and the others as "saturated," it is found that the number of subjects showing +, ++, or +++ in the hyperkeratosis tests is 37% for the "saturated" subjects and 35% for the "unsaturated." If the criterion for "unsaturation" is four or more test doses, the figures are 37% and 34% respectively, and 37% and 25% respectively if "unsaturated" is regarded as a requirement of five or more test doses. The differences between the figures for the two groups are certainly within the limits of experimental error, except in the case of the last comparison, where the small number of subjects in the "unsaturated" group renders the result less reliable, and it will be noted that in every case there was slightly more hyperkeratosis among the relatively saturated individuals.

TABLE VII—SUMMARY OF TABLES V AND VI

Hyper-keratosis reading	No. of subjects	Saturation tests							Aver. no. of doses per subject
		Doses required							
		1	2	3	4	5	6	7	
–	73	2	30	15	18	5	2	1	3·1
±	28	6	6	9	6	1	0	0	2·6
+	40	3	16	11	9	0	1	0	2·8
++	9	1	3	1	3	0	1	0	3·1
+++	8	1	2	2	2	0	1	0	3·1

Similar conclusions are reached when the figures for the individual groups are analysed separately, and the results for group D in May, a group of subjects not previously given saturating doses, were similar in this respect to those for groups A and C; this appears to overrule any objection to the results of the hyperkeratosis tests on groups A and C in May on the ground that the interval of three months between the two series of tests was not sufficient to allow the earlier hyperkeratosis to disappear.

It is not suggested that the results of this preliminary investigation rule out all possibility of a relationship between follicular hyperkeratosis and a deficiency of vitamin C, though in our subjects there were undoubtedly many cases of hyperkeratosis in individuals who, judged by saturation tests, were not at all "unsaturated" with regard to vitamin C. It is hoped that at some future date it will be possible to study this problem more fully, with a frequent examination of the subjects after saturation to determine in which cases the hyperkeratosis disappears after the saturation process.

SUMMARY

Vitamin-C saturation tests have been carried out on groups of medical students (31 34 in each group) in November, 1943, and February and May, 1944, to determine whether or not there is retention, at the end of three months, of any "body-reserve" of the vitamin resulting from the saturation tests.

An attempt has also been made to find out whether there is any relationship between "unsaturation" with subsequent tests. This might well be expected where the interval between the tests is long, but it seems rather surprising when the interval is only three months. Thus relatively unsaturated subjects of group A who received sufficient ascorbic acid to saturate them in November, *1943, were three months later again relatively unsaturated* compared with other members of their group or even compared with individuals who had not received the test doses in November; three months after the second saturation they were again more unsaturated than the others. In group C also, the more unsaturated subjects in February tended to be more unsaturated than the other members of their group three months later. Several reasons might be advanced to explain the tendency of these unsaturated subjects to become unsaturated again very quickly. These individuals might (1) regularly select, by choice or for some other reason, a diet relatively deficient in vitamin C; (2) show a high rate of utilisation or destruction of the vitamin in the tissues; (3) excrete abnormally large amounts in the urine owing to a relatively low renal threshold for ascorbic acid; or (4) show some deficiency in the absorption of the vitamin from the alimentary tract. Of these and other possible explanations the first two appear to be the most feasible, and in the case of a few of our subjects we have satisfied ourselves that the first is probably the factor concerned.

TABLE IV—SUMMARY OF SATURATION RESULTS

Period	Group	No. of subjects	Doses required to give "saturation"							Aver. no. of doses per subject
			1	2	3	4	5	6	7	
Nov., 1943	A	37	20	10	5	1	0	1	0	1·76
	B	23	6	15	2	0	0	0	0	1·83
	A+B	60	26	25	7	1	0	1	0	1·78
Feb., 1944	A	37	3	8	13	11	2	0	0	3 03
	C	31	0	9	11	7	2	2	0	3·26
	A+C	68	3	17	24	18	4	2	0	3 13
May, 1944	A	37	6	16	6	8	1	0	0	2 52
	C	31	4	13	9	5	0	0	0	2·48
	A+C	68	10	29	15	13	1	0	0	2 50
	D	34	3	14	4	8	1	3	1	3·09

Vitamin C, unlike some of the other vitamins—e.g., A, D, and E—is not stored in the ordinary sense in the animal body, but there is undoubtedly, in the tissues of a saturated individual, a "reserve" which might be regarded as a useful "balance" against a future emergency. This need not imply, of course, that saturation with this vitamin is desirable or at all necessary for the proper functioning of the metabolic processes of the body. It is not our intention to discuss at length this question of saturation and the value of the saturation tests as designed by Harris and his colleagues (Harris and Abbasy 1937, Harris 1942); in our experience, however, these tests, because of their simplicity and the clear-cut results, appear to be eminently satisfactory for the purpose for which they were intended. Perhaps it is sufficient to quote Harris (1943): "The purpose of the saturation test is to say whether the intake has been above or below some accepted standard of intake, and if below how much below. Whether saturation is desirable or not is beside the point."

Opinions are divided on the question of the "reserve" value of the vitamin C in the tissues. Zilva (1941) considers that the body ascorbic acid of a saturated animal does not act in any well-marked degree as a reserve, and he does not consider that the body can store this vitamin (cf. also Zilva 1936). Other authorities believe, however, that the reserve may have a real value; and, although it is not our wish to enter this discussion, we decided that it would be of interest in our survey to *determine* how long any reserve acquired during the saturation tests would remain effective, as judged by later saturation tests.

Information on this point is rather scanty, although Harris (1943), from observations over a period of years, has reached the conclusion that an interval of *six months or more between successive saturation tests is sufficient* to ensure that the effect of previous saturation in building up the "reserves" has worn off. Atkins (1943) found a difference of only three-quarters of a dose in the saturation-test requirements of two groups, one of which had been saturated four months previously.

The results of our investigations, summarised in table IV, show that the individuals (group A) saturated in November, 1943, were only slightly less unsaturated (0·23 of a test dose on an average) in February, 1944, than were other members of our student population—i.e., they had almost entirely lost in three months any "advantage" from the saturation. The tests made in May showed, however, that those saturated three months previously (groups A and C) were definitely less unsaturated (0 59 of a test dose) than were other individuals (group D). This difference between the results for the two three-month periods can perhaps be explained by the difference between the changes in the state of vitamin-C nutrition of the population, due primarily to seasonal variations in the dietary supply of the vitamin. The period covering these tests was one when we might reasonably expect, from our own earlier observations and from those of other investigators, a distinct increase in the number of doses required to give saturation over the period November to February, with a much smaller increase from February to May. The fact that the latter increase did not arise we attribute largely to the fact that there were a few issues of oranges during the spring of 1944.

The conclusions which might tentatively be reached from the results summarised in table IV are that any *extra* "tissue reserve" of vitamin C resulting from saturating doses will normally be largely lost by the body in the course of three months or less, if the dietary intake of the vitamin over this period is insufficient to meet the body requirements. Where the dietary intake is adequate there may be retention of part of the "reserve" for over three months. Perhaps it is only to be expected that the extra reserve should be dissipated in a "slump" period—i.e., that the more saturated individuals should use or lose vitamin C at a greater rate than those who are less saturated—but it was rather surprising to find that

TABLE V—COMPARISON OF SATURATION TESTS AND HYPERKERATOSIS TESTS IN GROUPS A AND C

Group	February, 1944									May, 1944							
	Hyperkeratosis reading	No. of subjects	Saturation tests							Hyperkeratosis reading	No. of subjects	Saturation tests					
			Doses required						Aver. no of doses per subject			Doses required					Aver. no. of dose per subject
			1	2	3	4	5	6				1	2	3	4	5	
A	−	19	0	6	7	4	2	0	3 1	−	13	1	7	0	5	0	2 7
	±	5	1	0	2	2	0	0	3·0	±	8	3	3	1	1	1	2 3
	+	5	1	1	1	2	0	0	2 8	+	9	0	5	3	1	0	2 6
	++	3	0	1	0	2	0	0	3 3	++	3	1	1	1	0	0	2·0
	+++	1	0	0	0	1	0	0	4·0	+++	1	0	0	1	0	0	3·0
C	−	17	0	6	4	4	2	1	3 3	−	14	1	6	4	3	0	2·6
	±	5	0	0	4	1	0	0	3 2	±	6	2	1	2	1	0	2 3
	+	4	0	2	0	2	0	0	3·0	+	7	0	4	3	0	0	2 4
	++	1	0	0	0	0	0	1	6·0	++	1	0	1	0	0	0	2·0
	+++	1	0	0	1	0	0	0	3·0	+++	2	1	0	0	1	0	2 5

phantasies in this period became non-sexual, in contrast to those of the early part of his service in the M.E., and they were largely concerned with his future. Frank sexual dreams had become rare, and nocturnal emissions, previously frequent, excessively rare. He recollected none in the preceding six months.

He returned to the U.K. in January, 1945, when he married. His attitude towards the marriage, both before and after, was difficult to assess. He insisted, rather too vehemently, that his feelings for his wife had not changed, and an impression of "duty" was conveyed. During the first six days following marriage menstruation prevented coitus, but in the remaining 21 days before his return to the M.E. he had intercourse once. This apparently was achieved satisfactorily. There was no active distaste, but his response was rather apathetic. There was no further desire on his part. He presented no evidence of homosexual trends.

Examination.—He was peculiarly and attractively diffident in manner and contrived successfully to appear tidy in hospital "blues." Weight 80 kg. Complexion high, skin of fine texture. Comparison with previous photographs showed no change in the facies. The beard was a moderate normal growth. The hair on the chest was very scanty and restricted o mid-sternum. The distribution of pubic hair tended to he transverse feminine; dense over pubis and scanty towards he umbilicus. He was well nourished but not adipose. The at distribution was consistent with that of the normal male, ut there was the suggestion of increased deposition round he pelvic girdle, notably suprapubically.

The breasts were well developed. The nipples were rather prominent, with readily stimulated erectile tissue. There was no increased pigmentation either of nipples or areolæ. Montgomery's tubercles were well marked. On palpation he breasts had the consistence of those with chronic mastitis No secretion was expressed. (Fig. 1 shows the bodily configuration.)

The penis and testes were of a large normal size There was no evidence of atrophy of prepuce or glans. A minor bilateral dilatation of the spermatic venous plexus was present, The prostate, per rectum, was not enlarged.

A tumour was felt in the left subcostal area, occupying the left hypochondrium and lumbar area as far medially as the mid-Poupart line. (The mass had been mistaken for an enlarged spleen with more than a little justification.) It could be defined as a prolongation from above, lying behind gut and descending on inspiration. The lower pole was four finger-breadths below the tip of the ninth rib and towards this pole there was apparent regular enlargement

Blood-pressure was 120/80.

Examination of the remaining systems demonstrated no abnormality.

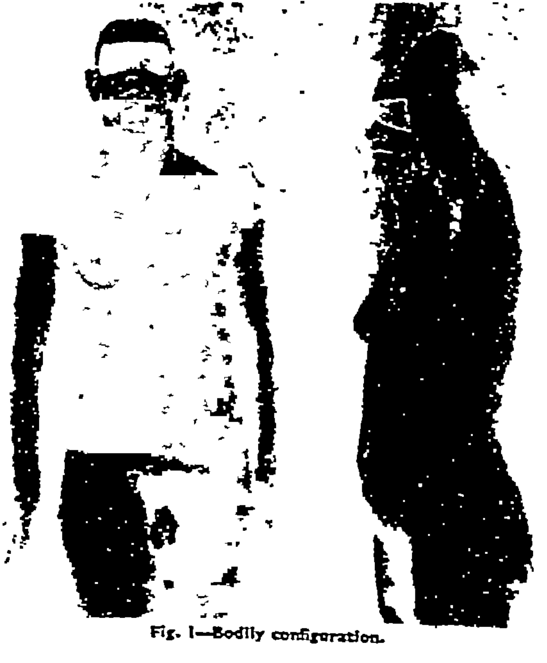


Fig. 1—Bodily configuration.

Investigations.—The radiological reports quoted below were made by Major W. G. Scott-Harden.

(1) "*Straight Plate*: the left kidney is displaced downwards by a large soft-tissue tumour; the tumour had not displaced the splenic flexure and does not fill the peripheral part of the left upper abdomen."

(2) "*Excretion Urography*: the upper calices and part of the renal pelvis are almost completely obliterated, with sharp delineation and no erosion" (fig. 2).

"*Opinion*: the appearances are consistent with a large left suprarenal tumour; infiltration of the upper pole of the left kidney cannot be excluded, although the urographic picture is quite in keeping with external pressure effects only"

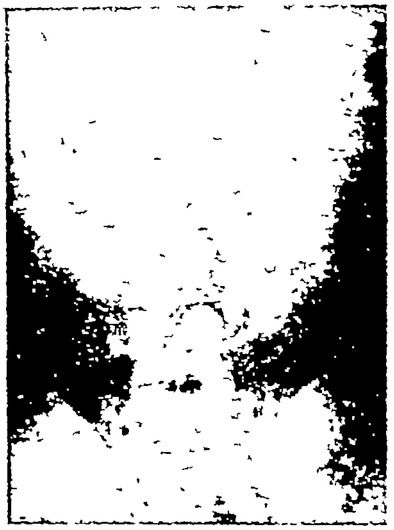


Fig. 2—Radiogram showing downward displacement of left kidney and obliteration of its upper calices and a part of its pelvis.

(3) "*Chest*: lung fields clear."

Other investigations gave the following results:—

Blood-cholesterol (April 1)	154 mg./100 c.cm.
Blood-urea (April 1)	20 mg./100 c.cm.
Friedman's test (April 1)	Positive.

(Neither a quantitative Friedman nor assay of œstrogen could be carried out.)

Glucose tolerance (May 10):

Fasting: 100 mg./100 c.cm.	½ hour: 137 mg./100 c.cm.
1 hour: 117 mg./100 c.cm.	1½ hours: 117 mg./100 c.cm.
2 hours: 110 mg./100 c.cm.	

Blood-count (April 10): Hb 103% (Sahli corrected), erythrocytes 5,290,000/c.mm., leucocytes 8200/c.mm. (polymorphs 68%, eosinophils 1%, mononuclears 4%, lymphocytes 27%).

Erythrocyte-sedimentation rate (Westergren): April 17, 30 mm./1 hour; April 19, 26 mm./1 hour; April 22, 28 mm./1 hour.

Urinary chloride concentration (April 15) on modified Cutler diet was within normal limits.

Semen: volume and motility normal

Urine normal on repeated analyses.

Operation.—On April 24, under nitrous oxide, oxygen, and ether anæsthesia, after 'Pentothal' induction (Major Gordon Neil), Lieut.-Colonel V. W. Dix excised the tumour through the left lumbar incision with subperiosteal resection of the last rib. No difficulty was encountered in separation of the tumour from the kidney. At the beginning of the operation intravenous saline drip was started.

Postoperative Course.—Recovery from operation was completely uneventful. The drip was discontinued at the end of 36 hours after a total of five pints. On May 14 (twenty days after the operation) Friedman's test was negative.

On June 6 (forty-three days after the operation), before evacuation to U.K. for deep radiotherapy, he was re-examined. He stated that his beard was of stronger growth, and at night he felt tempted to shave again. Interest in the opposite sex had revived, and erections had become frequent. (The first was on the eleventh day after operation.) He had three sexual dreams associated with emission, the first of them on the seventeenth day after operation. He referred, in a few terse phrases, to the lost opportunities of his honeymoon.

Examination.—He had the same rather diffident attractive manner noted at the original examination. No changes in the breasts were noted, save that there was a fairly profuse growth of downy periareolar hair. Erythrocyte-sedimentation rate 10 mm. Friedman's test negative.

Pathology.—Macroscopically the specimen was a large multilobulate tumour, consisting mainly of one large lobe and three secondary, one of which had been detached to facilitate removal at operation. It weighed 1420 g. and measured 21 cm. from upper to lower pole, or 23 cm. with secondary lobe in position; transverse diameter 15 cm.; anteroposterior diameter 10.5 cm.

the vitamin, as measured by the number of large test doses required to produce saturation, and the occurrence of hyperkeratosis in these subjects.

Subjects saturated in November, 1943, required three months later almost the same number of test doses to give saturation as did other subjects who had not previously received these large doses of ascorbic acid.

In May, 1944, the subjects who had not been tested before required, on an average, 0·6 of a test dose more than did those who had been saturated three months previously.

These observations suggest that an individual saturated with ascorbic acid will not necessarily show three months later any advantage, so far as these saturation tests are concerned, over an individual who has not previously been saturated. Some advantage—i.e., retention of part of the "body-reserve"—may be shown where the intervening period involves little or no increase in the degree of unsaturation of the population.

Subjects who were relatively unsaturated in the November tests tended to be relatively more unsaturated again in the February and also in the May tests. Several possible explanations of this are discussed.

The average number of test doses required to effect saturation was 1·8 in November, 1943; 3·1 in February, 1944; and 3·1 in May, 1944. These values do not compare unfavourably with the value of 3·25 for June and July, 1941, but they were appreciably higher than the figures obtained in 1939 and 1940 (about 1·5).

No significant correlation was observed between the occurrence of hyperkeratosis in these subjects and the degree of "unsaturation" with ascorbic acid.

We are grateful to Dr. George Graham for his suggestions and advice in connexion with the hair-follicle tests and for his interest in this vitamin survey. We also want to thank Mr. L. J. Hudson for his technical assistance in the chemical tests, and Messrs. British Drug Houses Ltd. for a supply of ascorbic acid.

REFERENCES

Atkins, W. R. G. (1943) *Nature, Lond.* **151**, 21.
Crandon, J. H., Lund, C. C., Dill, D. B. (1940) *New Engl. J. Med.* **223**, 353.
Francis, G. E. C., Wormall, A. (1942) *Lancet*, i, 647.
Frazier, C. N., Hu, C. K. (1936) *Arch. Derm. Syph., Chicago*, **33**, 825.
— — Chu, F. T. (1943) *Ibid*, **48**, 1.
Harris, L. J. (1942) *Lancet*, i, 642.
— (1943) *Ibid*, i, 515.
— Abbasy, M. A. (1937) *Ibid*, ii, 1429.
Harrison, R. J., Mourant, A. E., Wormall, A. (1939) *St Bart's Hosp. J.* **46**, 224.
Löwenthal, L. J. A. (1933) *Arch. Derm. Syph., Chicago*, **28**, 700.
Nicolau, S. (1918) *Ann. Derm. Syph., Paris*, **7**, 399.
Paterson, D., Daynes, W. G. (1941) *Brit. med. J.* ii, 787.
Prunty, F. T. G., Vass, C. C. N. (1943) *Biochem. J.* **37**, 623.
Scheer, M., Keil, H. (1934) *Arch. Derm. Syph., Chicago*, **30**, 177.
Wiltshire, H. (1919) *Lancet*, ii, 564.
Zilva, S. S. (1936) *Biochem. J.* **30**, 1419.
— (1941) *Ibid*, **35**, 1240.

"... Defining active anti-Nazis as those who opposed the régime through evidence of overt acts, and passive anti-Nazis as those who suffered through refusal to make concessions as proven by concrete events; and defining Nazis as members of the party, whether active or passive, enthusiasts or merely nominal members, significant psychological differences are discernible. . . . As compared with the others, studies of anti-Nazis revealed fewer instances of harsh, disciplinary fathers, more instances of mothers who openly demonstrated affection. Anti-Nazis were more frequently "only" children or favourite children. They had more frequently parents of different religions and different nationality. They had more frequent experience of travel (six months or longer) in foreign countries, which influenced their political or social viewpoints, and more frequently intimate friendships with people who were anti-militaristic or anti-Nazi. . . . The family background of anti-Nazis gave evidence, on the basis of points already enumerated, of more affection, less domination, more expression, higher self-esteem. They were more likely, for that reason alone, to differ from their uncritically compliant German fellow-men, trained so thoroughly in acceptance of authority and discipline."—Dr. D. M. LEVY, speaking to the New York Academy of Medicine on Nov. 20.

FEMINISATION ASSOCIATED WITH CARCINOMA OF THE ADRENAL CORTEX

A. J. S. McFADZEAN
M.B. Glasg.
MAJOR R.A.M.C.; MEDICAL SPECIALIST

FROM the suprarenal cortex Reichstein (1936) isolated adrenosterone, which has androgenic properties. Cortilactin, capable of producing hypertrophy of the mammæ and lactation, was isolated by Brownell et al. (1935), and Callow and Parkes (1936) obtained extracts with œstrone-like and progesterone-like activity.

There is remarkably complete clinical evidence of pathological conditions of the suprarenal cortex directly or indirectly responsible for excess secretion of androgen or œstrogen. This is especially true of androgen. Such pathological conditions may be a cortical hyperfunction, with or without hyperplasia, or a cortical adenoma (a somewhat rare cause), or a carcinoma of the cortex.

Cortical carcinoma associated with excess secretion of androgen is relatively common. In the male there is no gross sexual change save in the prepubertal period, when isosexual precocity develops. In the female virilism is the result.

Carcinoma associated with excess of œstrogen in the female before puberty produces isosexual precocity. Such tumours in the male occasion feminisation and are very rare. The first case in the literature was reported by Bittorf (1919). Since then 5 further cases have been recorded: 1 by zum Busch (1927) which was alluded to by Parkes Weber (1926), 2 by Holl (1930), 1 by Lisser (1936), and 1 by Simpson and Joll (1938). The present case constitutes the seventh.

The second case described by Holl (1930) and that described by Simpson and Joll (1938) are of special importance. Holl's is the only recorded case in which the tumour was successfully excised, with subsequent complete regression of symptoms. The importance of Simpson and Joll's case is due to the biological assays of œstrogen excretion in the urine. After excision of the primary growth œstrogen in excess was not demonstrable in the urine, and this was associated with clinical improvement. With the appearance of secondary growths and coincident recrudescence of symptoms œstrogen was present in excess.

CASE-RECORD

A lance-corporal, aged 29, was admitted to a Middle Eas general hospital on March 23, 1945, with a history of 18 hours intermittent shivering, headache, and general malaise. Nex day he was apyrexial and well. He was seen in consultatio with the M.O. i/c ward on the 26th, when the case wa presented as one of pyrexia of undetermined origin (resolved associated with gross splenomegaly.

He had served four years and three months in the Middle East and, apart from repeated periods in hospital with "dermatitis" since January, 1942, he had been well.

In October/November, 1943, he first noticed enlargement of the breasts. They rapidly increased in size in a couple of months or so, without causing any symptoms. During the six months before admission, though there was definite and progressive increase, it was slight. At no time had he abdominal discomfort, and, apart from skin lesions, he had been perfectly well. His appetite was normal throughout, and his ability to perform heavy physical tasks was unimpaired. There had been progressive increase in his weight in the past year.

He began shaving at the age of 15/16 and subsequently shaved daily. The hair on the chest was always scanty and no recent change had been observed. He believed that the distribution of pubic hair had altered, tending to be more sparse towards the umbilicus.

He had always been a normal male in outlook before the onset of breast enlargement. He had had intercourse at intervals since the age of 19 until leaving for the Middle East, where he had been continent. In the year before examination his interest in members of the opposite sex waned. His

After denervation of the left suprarenal and right hemi-adrenalectomy, without therapy to the pituitary, the Friedman became negative. The mechanism is obscure.

Lacassagne (1933) claimed inhibition of spermatogenesis in mice with exhibition of folliculin. In the present case the semen, on such examination as was carried out, was normal. Mathias (1922) reported good spermatogenic tissue on section of the testes in Bittorf's case. The prostate was not enlarged, nor was there dysuria, a finding also in Simpson and Joll's case. This is contrary to what one would expect from the experiments of Lacassagne (1933) in mice and of subsequent workers in other animals. This experimental action of œstrogen, however, has been shown to be inhibited by testosterone, and this may be the explanation in the present case—i.e., under influence of gonadotrophic hormone secretion of testicular androgen was maintained

The distribution of the pubic hair in Holl's first case was feminine, but onset was at or about puberty. In his second case, though the distribution was essentially masculine, hair on chest and abdomen became very sparse. The distribution in Lisser's case was unchanged. In the present case hair had always been scanty on the chest, and there was no change; but the hair on the abdomen became more sparse.

The weight increased in Bittorf's case; the increase was well marked in Holl's second case and initially in Simpson and Joll's case, the increase in twelve months from the onset being 28 lb.

Pain or any discomfort whatever was surprisingly absent in the present case in view of the size of the tumour and the multiple hæmorrhages It was prominent in two of the cases described: pain in the left flank was the cause of admission to hospital in Lisser's case; and left subscapular pain, approximately a year after the onset of breast enlargement, in Simpson and Joll's case compelled the patient to seek advice

Waning of the libido and subsequent impotence, with testicular atrophy, developed in Bittorf's case and in Holl's second case. In Bittorf's, impotence was complete seven months after the onset of breast enlargement. In that described by Simpson and Joll partial impotence was present approximately a year after onset. Holl's case was described as displaying no homosexual trends and completely disinterested in sex. Fifteen months from the start of breast enlargement the present case is known to have been potent. There was a gradual and progressive reduction in degree of heterosexuality, though he was still heterosexual before operation. How great that reduction was could be estimated after operation.

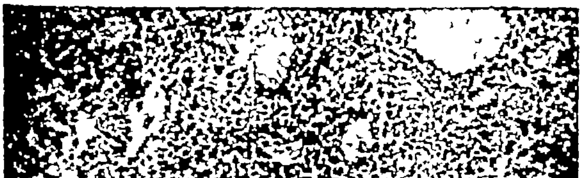


Fig. 4—Section of carcinoma of suprarenal cortex: above, low power; below, high power.

Greatly increased heterosexuality constituted the most striking change postoperatively. Return of interest in members of the opposite sex was rapid. Eleven days after operation there was an erection, and subsequently these became frequent. Seventeen days after, he had a frankly sexual dream with emission. Within the limited period of postoperative observation (forty-three days) no change in the breasts was noted. There was a distinct increase in beard growth and fairly profuse growth of downy areolar hair.

The postoperative course in Holl's second case was very striking. Before operation the patient was impotent and completely disinterested in sex. The penis and testes were small. The breasts were much enlarged, painful, and tender, with deeply pigmented and enlarged nipples. The facies were heavy and so changed that he was not recognised by his acquaintances. Seven days after operation the breasts were less painful and tender and, at the end of a month, erection and emission took place. Within a few months there was return of heterosexual desire, and sexual intercourse was resumed. Six months after the operation the penis and testes were of normal size, the breasts were small and not tender, and the nipples were consistent with those of a normal male.

If malignant change coincides with the start of breast enlargement, then the malignancy, clinically, of the tumour in the present case was low. Seventeen months after onset the tumour was still operable. Holl's second case, Bittorf's case, and Simpson and Joll's case must similarly have been of a low degree of malignancy; zum Busch's, Holl's first, and probably Lisser's cases pursued a rapidly fatal course with multiple secondaries.

SUMMARY

A case of carcinoma of the left suprarenal cortex with feminisation in the adult male is described. The clinical features of such cases are briefly discussed, as are certain variations in the present case from those previously recorded.

My thanks are due to Lieut.-Colonel V. W. Dix for a display of manual dexterity not readily forgotten; Lieut.-Colonel C. J. Gavey for many kindnesses; Colonel W. E. Harvey, R C.P. laboratory, Edinburgh, for his consideration and excellent photomicrographs; Dr. W. W. Adamson for his opinion on the section; and Major W. G Scott-Harden for the high quality of the clinical photographs.

REFERENCES

Beaumont, G. E., Dodds, E. C. (1944) Recent Advances in Medicine, London, chap. 10.
Bittorf, A. (1919) *Berl. klin. Wschr.* 56, 776.
Brownell, K. A., Lockwood, J. E., Hartman, F. A. (1935) *Proc. Soc. exp. Biol., N.Y.* 32, 997.
Callow, R. K., Parkes, A. S. (1936) *Proc. physiol. Soc.* 87, 16.
— — (1937) *Brit. med. J.* i, 456.
Del Castillo, E. B., Pinto, A. (1937) *Rev. Soc. argent. Biol.* 13, 426.
Frazier, C. N., Mu, J. W. (1935) *Proc. Soc exp Biol, N.Y.* 32, 997.
Gardner, W. U., Van Wagenan, G. (1938) *Endocrinology*, 22, 164.
Holl, G. (1930) *Dtsch. Z. Chir.* 226, 277.
Lacassagne, A. (1933) *C.R Soc. Biol., Paris*, 113, 590.
Lisser, H. (1936) *Endocrinology*, 20, 567.
McCullagh, E. P., Cuyler, W. K. (1937) *Ibid*, 21, 8.
Mathias, E. (1922) *Virchows Arch.* 236, 446
Meyer, R K., Leonard, S. L., Hisaw, F. L., Martin, S. J. (1932) *Endocrinology*, 16, 655.
Nelson, W. O. (1936) *Physiol. Rev.* 16, 488
Reichstein, T. (1936) *Helv. chim. acta.* 19, 223.
Simpson, S. L., Joll, C. A. (1938) *Endocrinology*, 22, 595.
Turner, C. W. (1932) in Allen's Sex and Internal Secretions, Baltimore, chap. 12.
Weber, F. P. (1926) *Lancet*, i, 1034.
zum Busch, J. P. (1927) *Dtsch. med. Wschr.* 53, 323.

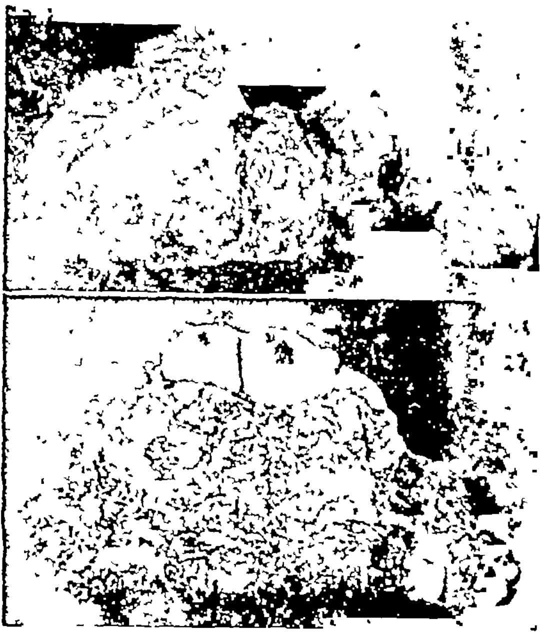


Fig. 3—Carcinoma of suprarenal cortex: above, as removed at operation and measuring 23 cm. in length; below, on section, showing multilobulate form, variegated appearance, and multiple hæmorrhages.

The tumour had a well-defined capsule, thinned over numerous small nodes. This was intact save at the upper posterior pole of the main lobe, where at two small areas the tumour had infiltrated through the capsule. Over the surface of the capsule coursed large tortuous thin-walled vessels (fig. 3).

On section the multilobulate form of the tumour was evident. Towards the centre of the main lobe was a "fibrous core" from which radiated well-marked trabeculæ. The cut surface had a variegated appearance. No normal suprarenal tissue could be identified. The greater part of the main lobe bore extraordinary similarity to the appearance classically associated with hypernephroma. The remainder of the tumour had a light-grey rather translucent colloid appearance. Multiple hæmorrhages had taken place (fig. 3).

Microscopically the appearances were those of an adenocarcinoma. The cells were arranged in groups or in columns. In parts there was resemblance in arrangement to the zones of the suprarenal cortex; notably the fasciculata and reticulata. Though there was considerable variation in size, shape, and nuclear characteristics, in the main the cells were fairly uniform, large, and polyhedral, with vesicular hyperchromatic nucleus, prominent nucleolus, and well-defined nuclear membrane. The cytoplasm was abundant, granular, and faintly eosinophilic. Vacuolation was a well-marked feature in some areas. Mitotic figures were readily found.

Among aberrant cell forms were (1) multinucleate giant cells, seen fairly often, and (2), rarely, large cells (30 µ), mononucleate or multinucleate, with abundant cytoplasm staining deeply with eosin.

A homogeneous eosinophilic albuminous material separating the cell columns was a prominent feature. In certain areas, notably where cells were arranged in groups, this material occupied cyst-like spaces (fig. 4). Colonel W. F. Harvey and Dr. W. W. Adamson considered that this was due to œdema.

The blood-vessels were large endothelium-lined channels with thin ill-formed walls. Vine's ponceau fuchsin stain was negative.

DISCUSSION

Gynæcomastia is common to all cases described, and it is surprising how this was ignored by the patient in the present case and in those described by Bittorf (1919) and Simpson and Joll (1938).

Except in Holl's (1930) first case (a boy, aged 15, who first noticed a tumour in the right upper abdomen) the breast enlargement was the first sign. In Holl's second case it was associated with considerable pain and discomfort. With this exception, as in the present case, the enlargement was symptomless. The degree of development varies. The most complete is that recorded by zum Busch (1927). The nipples were large and well developed, with increased pigmentation, and a milky fluid could be expressed on manipulation. At biopsy the appearances were typical of the fully developed secreting mammary gland. The present case showed no well-marked enlargement of the nipples, and there was no increased pigmentation or expressible secretion.

Experimentally, Gardner and Van Wagenan (1938), using œstrogens (theelin, theelol, œstradiol benzoate) in male monkeys (*Macacus rhesus*), produced hypertrophy of the mammæ, which on section were of adult type. Though some of the alveoli contained secretion, the picture was not considered comparable with that of the secreting gland; nor was growth of nipples considered to be an index of the degree of breast development. Frazier and Mu (1935) claim to have produced, with repeated injections of œstrogens in male rabbits, enlargement of the mammæ and lactation. Other observers claim that, whereas in the guineapig œstrogenic chemicals alone produce complete development, in the rabbit œstrone and progesterone are required (Turner 1932, Nelson 1936).

Since œstrone, progesterone, and cortilactin (this last capable of producing hypertrophy of the mammæ and lactation) have been isolated from the suprarenal cortex, it seems reasonable to assume that there may be variation in the hormone secreted.

In the present case 17 months after onset of gynæcomastia the penis and testes were large and well developed, in striking contrast to the 3 recorded cases in which comparison is possible. In that described by Bittorf a few months after onset of breast enlargement in August, 1918, there was decrease in size of testes. When examined by Bittorf in April, 1919, the external genitals were small. Approximately a month later Mathias (1922) at autopsy found the testes extremely small, and on section there were hardly any interstitial cells, but there was good spermatogenic tissue. In Holl's second case the penis and testes became progressively smaller after the onset of gynæcomastia. In the case described by Simpson and Joll breast enlargement began in 1932, and in August, 1933, the genitals were smaller.

Experimental evidence indicates that such atrophy may be expected. Thus Frazier and Mu (1935) with repeated injections of œstrogens in male rabbits produced atrophy of the glans penis and testes. Del Castillo and Pinto (1937), using very large doses in adult male rats, produced an increase in weight of the testes with appearance of increased spermatogenesis. This action was in contrast to that produced by smaller doses, which mainly led to atrophy of the penis and testes. This anomalous action, which seems to parallel the œstrogenic action of heavy doses of androgens (Callow and Parkes 1937), can scarcely be accepted as the explanation. A more attractive explanation rests on the conception of Meyer et al. (1932) that œstrone (or testosterone) produces atrophy of the gonads in experimental animals by inhibiting the gonadotrophic activity of the pituitary.

In Simpson and Joll's case the Friedman was negative whereas in the present case, before operation, it was positive. It is conceivable that the excess of prolan could explain the maintenance of size of the gonads.

The negative Friedman, twenty days after the operation, is surprising. There is no pathological evidence which would suggest that the prolan was of other than hypophyseal origin. It is regretted that a quantitative test could not be carried out. In cases of seminoma of the testes associated with excretion of hypophyseal gonadotrophic hormone in excess in the urine, after removal and successful radiation the hormone continues to be excreted in excessive amounts (Beaumont and Dodds 1944).

An interesting case is recorded by McCullagh and Cuyler (1937) of a young woman, aged 17, with adreno-pituitary syndrome (Cushing's) with positive Friedman.

On June 12 outpatient treatment with methyl thiouracil 0·6 g. daily (alone) was started. Within a week the patient reported feeling much better; bleeding had ceased, and diarrhœa was less. B.M.R. +10% on June 24. By June 26 motions were semi-formed and had decreased to one daily.

Methyl thiouracil had been reduced to 0·4 g. daily on June 19, and was further reduced to 0·1 g. daily on July 24. Fig. 1 shows progressive reduction in the number of motions until August 7, when the patient went on holiday. A slight relapse then took place, but from August 28, after her return, until Oct. 16, when methyl thiouracil was withdrawn, only one formed motion was passed daily.

On Nov. 13, after a month without methyl thiouracil, the patient was passing one formed motion daily, and sigmoidoscopy showed a normal mucosa. Weight had risen from 9 st. 5 lb. to 9 st. 9 ½ lb. during treatment.

CASE 3.—A single woman, aged 20, had first had diarrhœa in January, 1946. About 6 fluid motions were passed daily for four weeks, with mucus but no observed blood. Stools continued loose until June, when a relapse of diarrhœa occurred. She was admitted to Addenbrooke's Hospital on Oct. 18, passing up to 5 fluid motions daily with mucus, and the test for occult blood was positive. Barium enema showed loss of haustration in the descending and sigmoid colon. Sigmoidoscopy revealed an inflamed granular mucosa, which bled readily, and much adherent mucopus. B.M.R. +15%. Hb 104%. White cells 11,000 per c.mm. (73% polymorphs).

On Nov. 1 all other treatment was stopped and thiouracil 0·6 g. daily was started. The number of motions fell rapidly (fig. 2), and stools became more formed. Thiouracil was reduced to 0·4 g. daily on Nov. 14 but was restored to 0·6 g. daily on Nov. 19 because of a slight increase in stools. Sigmoidoscopy showed no appreciable change.

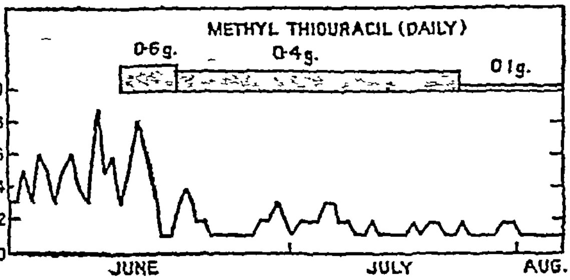


Fig. 1—Chart in case 2.

On Nov. 20 an acute tonsillitis due to hæmolytic streptococcus developed, and thiouracil was withdrawn on Nov. 21 to allow sulphathiazole to be given for the tonsillitis. It was considered unwise to administer both drugs for fear of depressing the leucocyte-count unduly.

Thiouracil 0·6 g. daily was resumed on Nov. 25, and by Nov. 29 one or two semi-formed stools were being passed daily.

CASE 4.—A single woman, aged 26, had been well during nursing training from March, 1944, until December, 1945, when she reported sick with diarrhœa of six weeks' duration. Blood and mucus were passed, and sigmoidoscopy showed patches of swollen hyperæmic mucosa about the size of a shilling high up in the sigmoid; excess mucus was present, and the mucosa bled readily. Hb 47%. Symptomatic and iron treatment improved the anæmia and general condition. On admission to the Middlesex Hospital, under Dr. G. D. Hadley, in April, 1946, she was passing 3–5 motions daily with small quantities of blood and mucus. Hb 89%; weight 9 st. 8 lb.

In June she was worse, having 10–12 motions daily with colicky pain and tenesmus. Laboratory examination of the stools showed no pathogenic organisms or parasites. Sigmoidoscopy (Mr. W. Turner Warwick) revealed a red granular mucosa, which bled readily. Treatment with phthalyl sulphathiazole 1 g. four-hourly to a total of 40 g. produced some improvement, but blood and mucus persisted in 5 or 6 daily motions. Sigmoidoscopy on June 29 showed little change.

In July phthalyl sulphathiazole was given again, together with a mixed vaccine of *Bact. coli* and *Strep. fæcalis*. Definite improvement followed; motions decreased to 3 or 4 daily, were formed, and contained little blood or mucus. The patient went home on August 15 but relapsed quickly and was readmitted to hospital on Sept. 19. Weight 7 st. 13 lb. Hb 84%. Sigmoidoscopic appearances as before. Desiccated pig's ileum was given for two weeks from Oct. 6 without evident benefit (fig. 3).

On Oct. 24 thiouracil 0·6 g. daily was started, and in the ensuing five days motions steadily diminished to 1 or 2 daily. By Oct. 31 the motions were formed, with only traces of blood or mucus, and thiouracil was reduced to 0·3 g. daily. B.M.R. −13% on Nov. 4 (it had been −5% on Feb. 22, 1944, during a survey of normal subjects). Sigmoidoscopy on Nov. 6 showed that the mucosa of the rectum was still friable and bled easily, but the mucosa of the colon above the rectum was much improved and bled only very slightly.

Progress was well maintained until Nov. 19, when thiouracil was reduced to 0·15 g. daily. Within twenty-four hours a slight relapse occurred with 3 or 4 unformed stools and some bleeding. Sigmoidoscopy showed slight but definite worsening of the mucosal appearances, and thiouracil was increased to 0·6 g. daily on Nov. 21. By Nov. 28 improvement was restored. Observation continues.

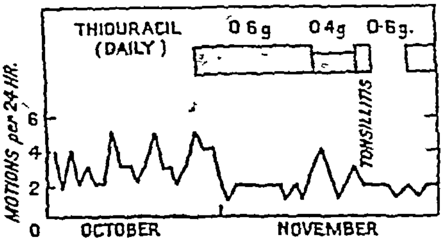


Fig. 2—Chart in case 3.

It is impossible at this stage to do more than point to the immediate amelioration of symptoms after administration of thiouracil in four cases of ulcerative colitis in relapse. It is evident that the normal formation of motions and cessation of diarrhœa in cases 3 and 4 preceded any obvious improvement in sigmoidoscopic appearances, and in cases 1 and 2 it was after four months' treatment that the mucosa appeared normal.

The optimal size and duration of thiouracil dosage must be determined by further trials, but the present impression is that reduction has been too rapid.

It has not been forgotten that ulcerative colitis is a chronic disease characterised by spontaneous and unpredictable remissions, and further long-term observations alone can show whether thiouracil treatment can alter the natural course of the disease.

Sufferers from ulcerative colitis are also readily influenced by spectacular remedies and suggestion, but in these cases thiouracil was given without comment or display of undue interest.

The mode of action of thiouracil can only be a matter for speculation at present, but it is clear that it did not produce frank hypothyroidism in these cases and so render the bowel-transit sluggish. It may well be significant that thiouracil and methyl thiouracil are chemically similar to synthetic 5-methyl uracil (thymine) which Spies et al.[1] found effective in treating the macrocytic anæmia and diarrhœa of tropical sprue. Of particular interest is their observation that stools became semi-formed and reduced to one daily as early as the fourth or fifth day of treatment.

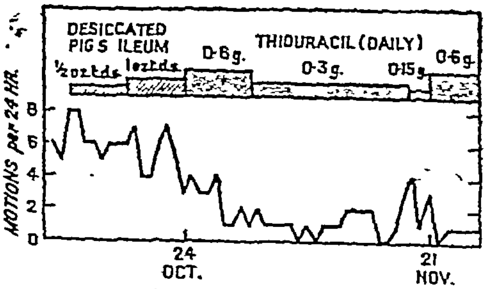


Fig. 3—Chart in case 4.

SUMMARY

Administration of thiouracil in three cases, and methyl thiouracil in one case, of ulcerative colitis in relapse was followed by immediate improvement.

---

1. Spies, T. D., Frommeyer, W. B., Garcia Lopez, G., Lopez Toca, R., Gwinner, G. *Lancet*, 1946, i, 883.

ACUTE INFECTIOUS LYMPHOCYTOSIS IN ENGLAND

ALEX J. STEIGMAN
M.D. Temple
TEACHING FELLOW IN PÆDIATRICS, TEMPLE UNIVERSITY, U.S.A.; FORMERLY CHIEF PHYSICIAN TO THE AMERICAN RED CROSS HARVARD FIELD HOSPITAL UNIT, SALISBURY

ACUTE infectious lymphocytosis was described as a separate clinical entity in American children by Smith (1941). In 1942 three children with this disease were encountered in England and were briefly mentioned by Kilham and Steigman (1942). Besides these three sporadic cases, a small outbreak affecting six children with acute infectious lymphocytosis was seen in southern England in 1942.

Clinical Picture.—A paucity of clinical symptoms and a hyperlymphocytosis are characteristic of this communicable disease. No bacteria or viruses have been isolated, and Smith (1944) found an incubation period of 12–21 days. Biopsy of lymph-nodes (Smith 1944) shows a degeneration of the lymph follicles, with proliferation of the reticulo-endothelium of the sinuses.

Most of the patients seen in the U.S.A. had no symptoms, the diagnosis being established on routine blood-counts in certain convalescent homes, orphanages, &c. The disease is almost entirely confined to children; those few with symptoms have had mild upper respiratory symptoms, low-grade pyrexia, cervical adenopathy, irritability, abdominal pain, and meningeal irritation.

Laboratory examination shows 12,000–100,000 leucocytes, with 50–90% of small mature lymphocytes, and these findings may persist even up to several months. Bone-marrow smears show an increased percentage of small mature lymphocytes. No anæmia or thrombopenia develops, and the heterophil agglutination reaction is negative.

Differential Diagnosis.—This requires the exclusion of infectious mononucleosis (spleen, general adenopathy, angina, fever, *atypical* immature lymphocytes, and a positive heterophil agglutination); lymphocytic leukæmia (enlarged lymph-nodes and spleen, fever, lymphoblasts, development of anæmia and thrombopenia); and pertussis (clinical course and bacteriology).

Transmission.—The communicability of this disease is attested by the institutional outbreaks in the U.S.A., showing a high attack-rate. The exact mode of transmission is not known; treatment is symptomatic.

English Cases.—Three sporadic cases and a small outbreak of six cases were seen in 1942. The sporadic cases, in common with the first American cases of Smith (1941), had mild fever, malaise, fatigue, slight sore throat, and slight cervical adenopathy. The remaining six cases came from one village within a fortnight. The degree of cervical adenopathy was rather striking, but the benign course, protracted lymphocytosis, and the absence of significant bacteria, anæmia, thrombopenia, and heterophil antibodies were typical.

Comments.—This recently recognised disease in children is probably not really new; probably institutional outbreaks, described as mild atypical forms of infectious mononucleosis (Reyersbach and Lenert 1941), were really acute infectious lymphocytosis. Though the disease has been of special interest to pædiatricians, there is no assurance of age limitation, just as there is no assurance of geographical limitation. All cases clinically detected so far have been very benign.

SUMMARY

The clinical entity of acute infectious lymphocytosis was observed in England in 1942.

Paucity of symptoms, benign protracted mature lymphocytosis, and the absence of anæmia, thrombopenia, or heterophil antibodies suggest the diagnosis.

It is hoped that recognition of this disease will lead to further knowledge of its incidence, range of severity, ætiology, epidemiology, and control.

REFERENCES

Kilham, L., Steigman, A. J. (1942) *Lancet*, ii, 452.
Reyersbach, G., Lenert, T. F. (1941) *Amer. J. Dis. Child.* 61, 237.
Smith, C. H. (1941) *Ibid*, 62, 231.
— (1944) *J. Amer. med. Ass.* 125, 342.

Preliminary Communication

TREATMENT OF ULCERATIVE COLITIS WITH THIOURACIL

WHILE the cause of ulcerative colitis remains unknown it is justifiable to test any empirical remedy, however devoid of logical basis it may appear, and success may give a clue to the ætiology.

The immediate improvement which followed the use of thiouracil in four cases described below warrants this preliminary note, which is intended to stimulate further trials.

CASE 1.—A married woman, aged 37, had had diarrhœa, with blood and mucus, on and off since 1935 and had been treated in several hospitals. In 1936 partial thyroidectomy was performed for Graves's disease, but the ulcerative colitis was unaltered. She attended the outpatient department of Addenbrooke's Hospital in November, 1944, during a relapse in which she passed 6–8 fluid stools daily, with blood and mucus. Sigmoidoscopy showed gross inflammation, with ulcers and bleeding. Hb 56%. She improved slowly with outpatient treatment, but motions were loose and contained excess of mucus for some months. In August, 1945, a severe relapse occurred and sphincter control was uncertain, but the patient refused admission to hospital. Slow improvement followed symptomatic treatment, but her daily life was greatly restricted by diarrhœa.

On March 1, 1946, during another relapse, outpatient treatment with thiouracil 0·6 g. daily was started, without other treatment. A preliminary attempt to measure the basal metabolic rate (B.M.R.) was unsuccessful, as the patient could not remain motionless during the test.

By March 8 the diarrhœa had almost ceased, and on March 12 the B.M.R. was estimated as +12%. On March 14 diarrhœa and bleeding had ceased, and the motions were semi-formed and did not exceed two daily. Thiouracil was reduced to 0·4 g. daily, and steady progress was maintained. B.M.R. +16% on April 25 and −3% on June 3. By June 28 motions were normally formed and rarely exceeded one daily. Sigmoidoscopy showed a virtually normal mucosa with no bleeding or inflammation.

Thiouracil was reduced to 0·1 g. daily on July 26 and withdrawn on Oct. 12. Weight had risen from 9 st. $6^1/_2$ lb. to 9 st. 12 lb. during treatment.

On Nov. 9, after a month without thiouracil, the patient was still passing one formed motion daily but reported the reappearance of some mucus. Sigmoidoscopy showed no inflammation or bleeding but an excess of mucus. B.M.R. +7% on Nov. 14. In view of the reappearance of mucus, thiouracil 0·2 g. daily was ordered, and observation is continuing.

CASE 2.—A widow, aged 54, with three months' history of diarrhœa with bleeding, attended Addenbrooke's Hospital in January, 1942. Sigmoidoscopy showed an inflamed mucosa with ulceration at 15 cm. and ready bleeding. Improvement followed treatment with kaolin and low-residue diet, but stools continued to be loose and frequent. In November, 1944, the patient attended hospital with another relapse, in which 6–10 motions with blood and mucus were passed daily. Sigmoidoscopy in January, 1945, again revealed inflammation and bleeding of the mucosa. Some improvement followed symptomatic treatment.

A further relapse took place in April, 1946. Barium enema showed an irregular mucosal outline and loss of haustration in the descending and sigmoid colon. Hb 90%. White cells 7000 per c.mm. (68% polymorphs). For two weeks the patient passed 3–9 motions daily (fig. 1).

EFFICIENT Hormone Therapy

Fundamental researches on the ovarian and testicular hormones have secured their preparation in pure, highly concentrated, accurately standardised forms suitable for logical and effective use in human therapeutics. Further, their successful syntheses have made adequate quantities available at greatly reduced prices.
British Schering's complete range of reliable hormone products worthily reflects these great advances.

♀ **PROGYNON**
PROLUTON
ORALUTON

TESTOVIRON
ORAVIRON ♂

Literature and price-list on application

BRITISH SCHERING LIMITED 167-169 Great Portland Street, London, W.1

5101

ANAHÆMIN B.D.H.

The Dakin and West
Erythropoietic Fraction of Liver

The clinical efficacy of Anahæmin B.D.H. in pernicious anæmia is remarkable even in the presence of factors tending to limit its activity.
For example, in some cases in which iron is not freely and abundantly available, erythropoiesis induced by Anahæmin B.D.H. may temporarily outstrip hæmoglobinisation, producing a hypochromic anæmia. The provision of an adequate diet during treatment is usually sufficient, however, to provide all the necessary iron and other hæmatinic substances required to produce a balanced and prompt erythropoiesis in response to treatment with Anahæmin B.D.H.
In some instances it is an advantage to provide an extra intake of ascorbic acid in the form of Vitamin C B.D.H., a precaution which tends to ensure the efficient utilisation of protein generally and in erythropoiesis in particular.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1
Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London

Anah/E/107

Hypothyroidism was not induced.

Further trials are needed to determine the necessary duration of treatment and to detect any effect on the natural course of the disease.

Thiouracil is chemically similar to synthetic 5-methyl uracil, which is effective in treatment of the anæmia and diarrhœa of tropical sprue.

I am greatly indebted to Dr. Leslie Cole for access to case 2, and to Dr. G. D. Hadley for details of case 4.

LAURENCE MARTIN, M.D. Camb., M.R.C.P.
Physician, Addenbrooke's Hospital, Cambridge.

Reviews of Books

Bacteria in Relation to Nursing

C. E. DUKES, M.SC., M.D., D.P.H., lecturer in bacteriology to sister-tutors, King's College for Household Science, London. London: H. K. Lewis. Pp. 186. 12*s*. 6*d*.

NURSES often seem to be taught rules and precepts of paralysing rigidity. In such subjects as hygiene and applied bacteriology—which are so far from immutable that the knowledge of ten years ago is mostly out of date—greater emphasis might be put on guiding principles than on rule-of-thumb about the proper strengths of antiseptics and the cleansing of bedpans. This book is therefore a welcome attempt to put the principles of bacteriology in a form useful to sister-tutors in their lectures. The selection of the material, however, is open to criticism. Bacteriology is, at the same time, a branch of systematic botany, a science in its own right, a handmaid of clinical diagnosis, and the theoretical basis of much of what is called "hygiene." In the education of the nurse the importance of the last far outweighs all the others, and it is regrettable that Dr. Dukes gives so much space to nomenclature and technique; a nurse making media or hunting for tubercle bacilli is wasting time better spent in learning about epidemiology and the spread of infection in wards. It is a pity, too, that he omitted the excellent syllabus of lectures and demonstrations suggested in appendix F of the M.R.C. War Memorandum no. 11. Nevertheless this book fulfils a real need, and, backed by the practical examples of ward and theatre, and, it is to be hoped, by the coöperation of physician, surgeon, and bacteriologist, will enable a sister-tutor to prepare a satisfactory schedule of lectures on the principles on which the control of infection is based.

The Dynamic State of Body Constituents

(2nd ed.) RUDOLF SCHOENHEIMER, M.D., late associate professor of biological chemistry, Columbia University. London: Oxford University Press. Pp. 78. 10*s*.

THE pioneer work of the late Rudolf Schoenheimer and his colleagues, using compounds containing heavy isotopes of carbon, hydrogen, and nitrogen, has led to the conception that the proteins and fats of the tissues, while apparently constant in composition and amount, are in reality perpetually being broken down and resynthesised. This too too solid flesh is in a continual dissolution and thaw. The lipids of the fat depots are undergoing surprising interconversions, while the proteins are in dynamic equilibrium with a pool of amino-acids and α-keto-acids. The use of heavy isotopes has also thrown light on creatine synthesis and provided confirmatory evidence for the Krebs urea cycle. Schoenheimer died in 1941, and the lectures now reprinted were given just before his death, and first published in 1942. The second edition is most welcome, but it might have been as well to have indicated in footnotes where subsequent work has reinforced the evidence presented, and, more particularly, filled in the gaps.

Men, Medicine and Myself

S. VERE PEARSON, M.D. Camb., M.R.C.P. London: Museum Press. Pp. 254. 12*s*. 6*d*.

AN autobiography can never give quite the pleasure to the reader that it does to the writer, but Dr. Pearson's comes near it. He lacks only one quality of the practised story-teller: he is devoid of *Schadenfreude*, he takes no pleasure in the misfortunes of others. That may be because he graduated early in the school of human experience and then took out a perpetual postgraduate course. It was his good fortune to contract tuberculosis just when a revaluation of its curability had set in, and his own life-work covers the whole period of effective treatment. He had the luck too to be sent to Nordrach and his appreciation of Otto Walther after 40 years is a model of what a profile (as it would now be called) should be. Time has not dulled his memory nor allowed woolly sentiment to creep in. With this good start there is hardly a chapter in treatment that has not been illumined by the naturalist's curiosity which is to him the quality most needed in medicine; *that and the* ability to bring home to the lay mind the lesson of healthy living. Moreover he can spell every name except soldanella.

The Principles of Anatomy

(2nd ed.) A. A. ABBIE, M.D., D.SC., Elder professor of anatomy and physiology, University of Adelaide. London: Angus & Robertson. Pp. 273. 12*s*. 6*d*.

IN their revolt against the treatment of anatomy a a routine and unintellectual preliminary subject, teacher are insisting more on knowledge of principles than o memorisation of topographical detail. For many year much of the anatomy taught in medical schools ha been related mainly to the technique of surgery: indeed *the subject has tended more and more to become fi* for a technical school rather than a university.' Yet th intellectual content of this science is considerable an can be developed. Professor Abbie's little book provide the student with an introduction to anatomy and meet a demand. It is short and concise—but perhaps rathe too short, for brevity compels him to be didactic an seemingly uncritical just where it is most necessary t keep the student's mind open and fluid. In a third editio much of the purely descriptive sections (which, in an case, are rather out of place in a book dealing wit "principles") might be eliminated, and those dealin with muscle action, joint movement, and the endocrin system could with advantage be amplified. We woul also plead for more realistic illustrations, which woul give the reader a better opportunity of developing som sense of living plasticity rather than a false impressio of diagrammatic rigidity.

Psychology of Women

Vol. I—*Girlhood*. HELENE DEUTSCH, M.D., assistan psychiatrist, Massachusetts General Hospital. London W. Heinemann. Pp. 312. 21*s*.

AT a time when economic and political decisions tur partly on alleged psychological differences between me and women, many will turn to a book with this title, i the hope of finding in it a statement of the distinctivel feminine attributes, as well as an explanation of thei development. It does not provide such a statement perhaps because it is restricted to girlhood (a second volume will deal with motherhood), and perhaps als because the writer approaches her topic throughout a a psycho-analyst, more intent on interpreting the *dynamic origins of psychological* phenomena *than on* determining what these phenomena are. The psycho-analytical explanation which she sets out with persuasive lucidity centres on "the three essential traits of femininity—narcissism, passivity and masochism." The earlier part of the book examines, in a natural sequence, prepuberty, early puberty, adolescence, and menstruation. Chapters less obviously connected with phases of development follow, having as their theme eroticism, passivity, masochism, the "masculinity complex," and homosexuality in women. The argument is frequently illustrated by case-histories and the recorded conduct *and sentiments of famous persons, like* George Sand and Marie Bashkirtseff. Dr. Deutsch is no doctrinaire psycho-analyst: she was trained by Freud and worked closely with him for years, and has therefore felt free to modify some of his tenets in accordance with her clinical experience. Readers who are not psycho-analysts will find the book sensible and illuminating, and its account of children's fantasies credible. In spite of the pathological material on which it is based, it is largely concerned with the means whereby women grow up well adjusted to their real surroundings, and it gives full weight, among the dynamic influences that form women's personality, to the human and social features of their environment.

THE LANCET

LONDON: SATURDAY, DEC. 28, 1946

Brain-power

THE present man-power shortage is particularly cute in the professions and the upper ranks of indusry, commerce, and the public service This state of affairs is due partly to the seven years' gap in recruitment to some callings and partly to reduction in the number of university students during the war; but t derives also from greater efforts to make industry efficient and to develop the social services. In their atest broadsheet [1] P.E P. estimate that ideally the annual intake to the professions should exceed the pre-war level by 80% in 1946–50, and by 55% in 1951–55. For the next ten years teaching alone will need 23,000 recruits a year; and there ought to be substantial ncreases in the number of nurses, scientists, dentists, social workers, and medical auxiliaries The Barlow Committee has advised that the annual output of pure scientists should be twice the pre-war total of 2500; and there should be about the same increase in technologists. According to the Teviot Committee, the annual output of dentists, which was 340 before the war, should be raised to 800 as soon as possible. By comparison, the medical profession is well served: the Goodenough Committee's 1944 estimate was that a 20% increment would be enough; and the committee held that this could be achieved in six years by a 15% increase on the pre-war annual output of 2000 doctors. Professions in which the pre-war intake will suffice, after the war-time fall in recruitment has been made good, include accountants, company secretaries, and librarians. Those in which present numbers are enough comprise opticians, pharmacists, and possibly also solicitors.

Nobody can say how much demand there will be for university graduates in arts, but P.E P suggest that in order to balance the tendency towards specialisation more young men and women should study the humanities. The risk of encouraging them to take an arts degree is that those who are not absorbed elsewhere may reluctantly turn their hand to teaching, with unhappy results for themselves and for that profession. Much of course will depend on industry's liking for men and women with university qualifications. Owing to the replacement of smaller undertakings by large ones, managers are now usually appointed on their merits, and it has become unusual for a firm to recruit its senior staff in their teens. The Cambridge University Appointments Board found that 73% of employers favour a preliminary university education, because it induces an independent and critical outlook, capacity for responsibility, and social ease. With opportunities for higher education depending more and more on ability, rather than on the parents' capacity to pay, industry may in any case have to look to the universities if it wants brains.

Recruitment to the professions and administration should be planned with three aims: the recruits should be of high quality; the supply should be adjusted to the demand; and there should be fair distribution between the various callings. All this can best be achieved by offering advice and information about careers; by financial aid for suitable people who cannot meet the cost of education; by improving methods of selection; by balancing salaries and conditions between the major callings; and by tapping all sources. Perhaps only the Government can give wide enough publicity to training and prospects of employment; but the Ministry of Labour has not yet taken the steps to issue "reports on trends of employment in relation to higher appointments" which the Hankey Committee recommended. An annual Government prediction, imperfect though it might be, could be no wider of the mark than that of parents who act on rumours of excellent prospects in some particular profession. If the best recruits are to be secured, the opportunity for training must depend solely on ability; and the P.E P. report urges that selection should be both by intelligence, as judged by written examination, and by character, as assessed by interview, some university scholarships being awarded for outstanding personal qualities combined with good intelligence. Factors influencing the intake of recruits to the various callings include the financial rewards, the prospects of promotion, and the conditions of service; but happily there are also other incentives—the interest of the work, the sense of purpose it bestows, the esteem in which it is held, and the scope it offers for initiative and responsibility. These considerations, which do not weigh equally with all young men and women, must be reviewed in occupations where entrants are too few or of poor quality. Thus the McNair Committee recommended an increase in salaries and improvement in the status of teachers, and the Government have lately taken action on similar lines in relation to the nursing profession The Teviot Committee reported that "dental appointments should compare with those available to medical personnel more favourably than they do at present, as regards status, remuneration, and opportunities."

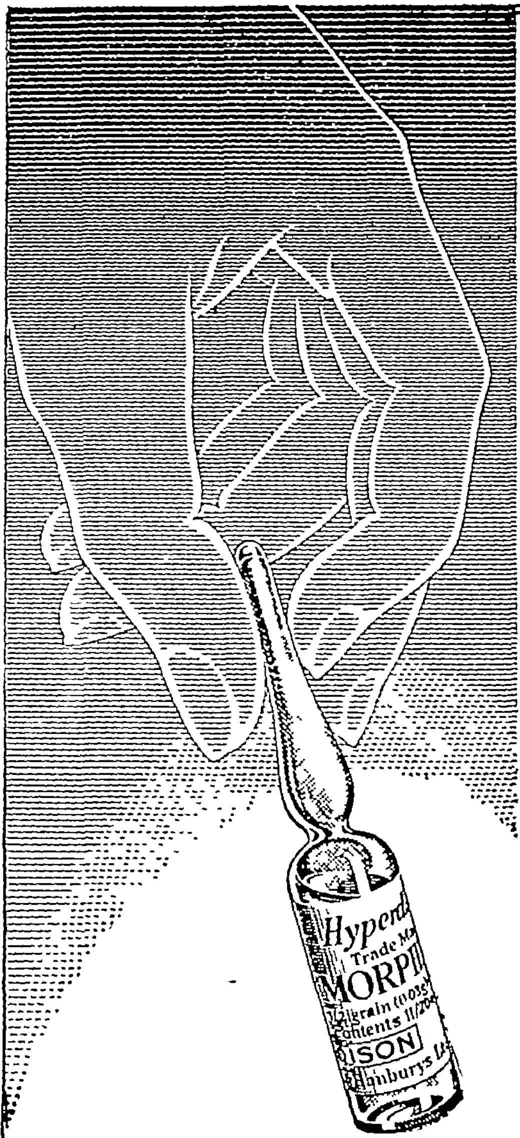
The P.E P. survey underlines the urgency of marshalling the country's brain-power, including that of the refugees now among us. In the final count, however, success will depend on the careful sieving of the nation's youth, the training of all who are suitable, and a balanced allotment between occupations. Here, as in other tasks where resources are scanty, priorities must be decided. Teachers in universities and schools should, perhaps, come first, but other competing demands are not easily settled: what, for example, of the rival calls for pure scientists and doctors? It would be useful to have from time to time an estimate of the relative force of the various claims on our stock of trained intelligence.

Liver-function Tests

THE object of tests of liver function is twofold: to express the extent of liver damage quantitatively, and to aid in the diagnosis between jaundice due to obstruction of large ducts and that due to a diffuse hepatitis. The functions of the liver are many, and the tests based on them are so numerous that the clinician may well wonder which will serve his purpose best. Until recently, evaluation of the tests was based on findings obtained in typical examples of a given disease. If these results were consistent, then similar

---

[1] Britain's Need for Brainpower. *Planning*, no. 259: obtainable from P.E.P., 16, Queen Anne's Gate, London, S.W.1. Pp. 19. 1s. 7d.



A boon to Patient, Doctor, and Nurse

Clinical trials have demonstrated that the period of narcosis produced by morphine can be considerably extended if the base is administered in the form of mucate instead of the usual salts such as tartrate or sulphate.

Hyperduric MORPHINE is a solution of morphine mucate. After a subcutaneous or intramuscular injection of a ½-grain dose there is relief from pain for eight to twelve hours.

By most patients ***Hyperduric*** MORPHINE is well tolerated in ½-grain doses, and reports show that nausea and vomiting are greatly reduced.

Hyperduric

(Trade Mark)

MORPHINE

for P-R-O-L-O-N-G-E-D action

Ampoules of 1 c.c. : box of 12, 7/6

Rubber-capped bottle of 10 c.c., 5/6

Literature on request

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE BISHOPSGATE 3201 (12 LINES) TELEGRAMS "GREENBURYS, BETH. LONDON" antidiuretic effect. From all this VERNEY postulates at there are in the brain " osmoreceptors " which are osely connected by nerve-paths with the pituitary, d, according to tonicity of the blood supplying em, are continually regulating the secretion of e antidiuretic hormone and hence of the urine ow. The exact site of these osmoreceptors is still certain.

The renal mechanism through which the posterior tuitary acts has not yet been revealed by VERNEY'S periments. It has been generally assumed that the tion of the posterior-pituitary secretion is mainly tubular reabsorption, but it remains to be seen hether in addition there is not some alteration of nal circulation like that demonstrated by TRUETA ad his colleagues[1] after various types of nerve imulation. One obvious difference is that the Trueta henomenon disappears after physiological denervaon of the kidney by splanchnic block, whereas osterior-pituitary extract continues to act on the enervated kidney.

Annotations

GUIDE TO BOARDING OUT

RULES always need explanations if they are to be beyed willingly and intelligently. On paper, the egulations for the boarding out of children should have ufficed at least to prevent tragedies in practice, but hey were such dull official reading that they failed to ouch the imagination, or to bring home their responsiilities to some authorities. As a result of Sir Walter onckton's report, in 1945, on the death of Dennis 'Neill, the Home Office and the Ministry of Health ave revised the boarding-out rules, and the work of any local authorities has been reviewed. The new ules have been incorporated in an explanatory memoandum[1] which includes such of the Curtis Committee's ecommendations[2] as can be applied without legislative hanges. Thus the hoped-for " children's officer " does ot yet appear, though the boarding-out visitor is charged ith many of her duties. While the child is in a reception ome the visitor who will later supervise him is instructed o get to know him " as a new friend," and to tell him bout the plans being made for him, describe the fosterome when it is found, and encourage him to look forward o being received into it. She must also get to know he foster-parents as a friend, and must make it clear to hem that they share the responsibility for the child with the local authority, and help them to fulfil their undertakings. The child must be examined by a doctor before being boarded out, and a doctor—who may be the medical officer of the local authority or the family doctor of the foster-parent—must be appointed to attend him when ill, and to examine him yearly. The local authority is responsible for all medical and dental care, and must be notified if the child is seriously ill or hurt; the visitor must make sure that the foster-parents can get into touch with her quickly in case of need. Her attitude to the child is carefully outlined; she must—

> ". . . attempt to find for each child the environment most suited to his temperament and aptitudes, endeavouring to make the first placing a successful and lasting one. She will consider, for example, whether the child in question needs a careful and orderly home, or will be happier where standards are not too rigid; whether he has a stronger preference for town or country life, and whether he is accustomed to, and would miss, the company of other children of his own age. For a dull child she will try to find a foster-home where he will not suffer by comparison with more intelligent children, while for a child of high intelligence or with some special ability she will seek an environment in which his interests and potentialities will be understood and encouraged. Some foster-parents will be at their best with a delicate, nervous, or physically neglected child, while others will be able to understand and manage the active undisciplined boy or the precocious adolescent girl."

This is the sort of guidance which will help boarding-out visitors to recognise their opportunities; but it implies, of course, that they have a wide choice of foster-homes at their disposal. This is not always so, and it is perhaps a pity that the memorandum does not draw attention to another suggestion of the Curtis Committee —that opportunities for boarding out in comfortable middle-class homes should be more fully explored.

The child's needs and wishes are well considered throughout the memorandum. Two pieces of advice serve to show that these are assessed by contemporary standards: the child is to have regular pocket-money and is to be encouraged to learn how to spend it as well as how to save it; and the foster-parent is to let the visitor know when extra financial help is needed " for holidays and for festive occasions, for a bicycle, or for special clothing for games or other purposes."

INFECTIOUS LYMPHOCYTOSIS

IN 1941 Smith[1] in America drew attention to a benign and probably infectious lymphocytosis appearing as an acute or chronic disease in children. The acute cases had a vague and varied symptomatology, but a sharp lymphocytosis was always present. The chronic cases usually followed an infection of the upper respiratory tract; there was a low, persistent pyrexia, vague malaise and anorexia, and often spasms of peri-umbilical pain; a persistent lymphocytosis lasted a month or more; eventually the whole disturbance settled down, and there were no complications. Duncan[2] described an acute case in a girl of 5 years, beginning with acute abdominal pain and rigidity; there was no enlargement of lymphatic glands, liver, or spleen; there were 29,600 lymphocytes per c.mm., sternal puncture showed increased cellularity with 86% lymphocytes, platelets were rather low, but red cells and hæmoglobin were normal; the Paul-Bunnell (heterophile antibody) reaction was not significant. The acute symptoms subsided in a few days, but the pyrexia and the lymphocytosis persisted for a month. Later Duncan[3] reported 2 cases in young adults, and added a morbilliform rash to the clinical picture. Another acute case in an adult—this time a U.S. naval recruit of twenty-nine—is reported by Yuskis,[4] and here again there was a morbilliform rash, mainly on hips, thighs, and legs, and lasting three weeks.

Lorenz and colleagues[5] report 2 more cases in children with peak counts of 47,500 and 58,000 lymphocytes per c.mm., and clinically only mild respiratory affection; sternal marrow was normal in these patients, with no lymphocytosis; the Paul-Bunnell reaction was positive up to a titre of 1 in 80, but this is too low for a diagnosis of infectious mononucleosis. In this issue Steigman reports a small outbreak involving 6 children in one village in southern England; here cervical lymph-glands were notably enlarged and there was protracted lymphocytosis, but all recovered without incident. According to Smith[6] the disease is con-

---

[1] Trueta, J., Barclay, A. E., Daniel, P., Franklin, K. J., Prichard, M. M. L. *Lancet*, 1946, ii, 237.

---

[1] Home Office and Ministry of Health. Memorandum on Boarding Out of Children and Young Persons. H.M. Stationery Office. Pp. 18. 4d.

[2] See *Lancet*, Nov. 2, p. 646.

---

[1] Smith, C. H. *Amer. J. Dis. Child.* 1941, 62, 231.

[2] Duncan, P. A. *Ibid*, 1943, 66, 267.

[3] Duncan, P. A. *New Engl. J. Med.* 1945, 233, 177.

[4] Yuskis, A. S. *J. Amer. med. Ass.* 1946, 132, 638.

[5] Lorenz, M., Hardy, L. M., Alt, H. L. *Ibid*, 1946, 131, 888.

[6] Smith, C. H. *Ibid*, 1944, 125, 342.

data in atypical forms of the disease would influence the physician in his ultimate diagnosis. The assessment of tests has therefore rested in the first place on the clinical diagnosis of so-called typical cases, backed by a proportion of observations made at operations or necropsies. Such a basis is not entirely satisfactory, so the correlation of liver tests with the histological appearances of material obtained by liver puncture has a special value. Such a correlation has now been attempted by SHERLOCK.[1]

SHERLOCK has considered serum bilirubin, phosphatase, cholesterol, protein, albumin-globulin ratio, the intravenous galactose test, and the intravenous hippuric-acid synthesis test in the light of liver biopsies. She finds that in hepatitis the serum-bilirubin level parallels cell damage, but in duct jaundice it depends on the degree of duct obstruction rather than on damage to the parenchyma. The hippuric-acid synthesis test shows deficient function in most forms of jaundice, but since this does not parallel the histological picture the test is unsatisfactory. Total protein was also not considered a useful test, though, as SHERLOCK remarks, it is often low in all forms of jaundice; this reduction should provide a useful pointer to the need for plasma transfusion in surgical cases. The albumin-globulin ratio was usually low in hepatitis, from a decrease in albumin with a normal or raised globulin. In duct jaundice the albumin-globulin ratio was also sometimes low, from a decrease in albumin rather than an increase in globulin; this is probably an index of associated cell damage. (Some cases of obstructive jaundice do have a raised serum globulin, probably those in which there is an added infection.) The galactose-tolerance test correlated best with the histological findings, and according to SHERLOCK this test was positive in 15 out of 18 cases of obstructive jaundice. This contrasts with MACLAGAN's[2] 59% of normal results. The difference may be due to the fact that in all SHERLOCK's cases the duct obstruction was complete; the value of the test in partial duct obstruction would then be correspondingly less. In view of this, the bromsulphonephthalein test, less popular here than in the United States, might also be worthy of investigation with histological controls.

Only one test offered some hope of distinguishing between hepatitis and duct obstruction. SHERLOCK found the phosphatase raised, but not above 30 units, in most cases of toxic hepatitis, and above 30 units in nearly all cases of complete duct obstruction. In the latter group it was more or less independent of liver-cell damage; but it may be supposed that in incomplete obstruction phosphatase would often be less than 30 units, so the test would be inconclusive in that difficult group of cases presenting variable jaundice, pain, dyspepsia, and possibly fever. The so-called empirical tests therefore deserve more consideration. In a recent series,[3] the cephalin-cholesterol flocculation test[4] was positive, and the thymol turbidity test[5] greater than eight units in 22 of 29 cases of hepatitis, the 7 weak reactions occurring in cases which cleared up in a week or two. These same tests were negative in 90% of patients with obstructive jaundice, even when this w severe and of three or four weeks' standing associated with moderately extensive metastases. Th few positives were associated with severe infectio very extensive malignant metastases, or long-standi obstruction.

It seems that, apart from the empirical ones, the tests of liver function have little value in the differential diagnosis of jaundice. The serum-bilirubin an galactose-tolerance tests have a quantitative value hepatitis, though their prognostic significance is n great since in most instances the damage indicate whether great or small, is quickly made good. surgical jaundice a positive galactose test m suggest that a given case is a poor operative risk, bu since in the absence of surgery the outlook is dim, th surgeon might well decide to ignore the biochemic findings.

Pituitary Control of Water Excretion

NEARLY fifty years ago it was recognised th extracts of the pituitary gland contain substanc which influence the renal excretion of water, and f the last twenty-five years Prof. E. B. VERNEY, F.R.S has been working on the problem. His Sharpey Schafer lecture at Edinburgh, published in our issu of Nov. 23 and 30, summarised his results, which d much to explain the rôle of the posterior pituitary i the regulation of urinary excretion.

If a dog is given 250 ml. of water by stomach-tub it will usually respond by a diuresis reaching it maximum in about 50 minutes; but if, after th ingestion of water, it is subjected to muscular exercis or emotional stimuli, the rate of water excretio usually falls suddenly, the maximum not bein regained for some 40–50 minutes. The obvious interpretation of this was that the emotion or exercis produced vasoconstriction in the kidney, eithe directly through the nervous system or through th secretion of adrenaline. This interpretation, howeve has been proved wrong: in the first place, the respons occurs equally after denervation of the kidney secondly, the fall in urinary output which follow clamping the renal artery lasts only as long as th obstruction persists; and, thirdly, the fall induce by adrenaline is just as temporary. Where, therefore are we to seek the cause? VERNEY has clearly show that the time-water-output curve can be exactly imitated by giving the animal an appropriate dose o posterior-pituitary extract, and it seems probable therefore that the change in water output following exercise or emotion is conditioned by a sudden outpouring of an antidiuretic hormone by the posterio pituitary gland. This probability is supported by VERNEY's further work. He finds that when an isotonic solution of sodium chloride is injected into the exteriorised common carotid artery the rate of urinary excretion is unchanged; but with hypertonic solutions there is an inhibition of urinary flow of the same form as that obtained by injection of pituitary extract. (With sodium chloride, saccharose, and glucose in an equivalent strength of "hypertonicity" the inhibition is approximately the same: urea, on the other hand, has no effect, because it diffuses easily from extracellular fluid to cells.) If the pituitary gland has been previously removed, or the internal carotid artery has been tied, infusion of hypertonic solutions has

---

1. Sherlock, S. P. V. *J. Path. Bact.* 1946, 58, 523.
2. Maclagan, N. F. *Proc. Ass. clin. Path.* 1945, 1, 22.
3. Maizels, M. *Lancet*, Sept. 28, p. 451.
4. Hangar, F. M. *J. clin. Invest.* 1939, 18, 261.
5. Maclagan, N. F. *J. exp. Path.* 1944, 25, 234.

chiefly a nuisance because of the large amounts of human food which they eat or damage.

A pamphlet[2] prepared by Mr. S. A. Barnett for the Ministry of Food stresses the need for a systematic search for rats or mice before any attempt is made to exterminate them. The brown rat follows man in both town and country, living in sewers, factories, and warehouses, and burrowing under hedge-banks and ricks. The black rat, an active climber, is confined mainly to ships and dockyard areas, but is also found inland. The house mouse (*Mus musculus*) adapts itself less well, and usually nests as near as possible to the source of food. In tackling an infested area the nesting sites must be found, then the feeding-places, and finally the runs between the two. Evidence of the last is given by smears left on floors and beams, by droppings, by holes in walls and tooth-marks on metal (rats can, and do, gnaw through lead pipes half an inch thick); also by footmarks, damage to sacks, and disappearance of food. When a rough idea of the size of the infested area has been gained, a sketch map is drawn, and plain bait is laid along the known runs. It may take several days before the bait is accepted; then the poison is added. The bases recommended are damp sausage rusk, sugar meal, bread mash, and soaked wheat. Zinc phosphide 1 in 40, arsenious oxide 10%, red squill powder 10%, and 'Antu' 2% are the chief poisons suggested. Best results are obtained by treating rat-holes in the open, for then cyanide powders can be introduced and the holes securely blocked.

RESEARCH IN MELBOURNE

OUR knowledge of viruses owes much to the Walter and Eliza Hall Institute of Research in Pathology and Medicine, and the director's annual report for 1945–46 again tells of stimulating progress. Following the work of Habel in the United States the Melbourne team has found a simple method of cultivating mumps virus by amniotic inoculation, and mumps and influenza viruses apparently resemble each other in size, in hæmagglutinating behaviour, and in growth on the chick embryo. A suitable technique for titrating antibody by inhibition of hæmagglutination has been worked out and already observations have been made on the sera of convalescents. Mumps virus has been produced in quantity, and formalin-inactivated virus was found to produce significant amounts of antibody when inoculated into young adults. Field tests among school-children are under way and it is hoped that it may yet be possible to produce a single-dose vaccine. Work on the influenza viruses continues, and in October, 1945, the first Australian epidemic of influenza B was recognised.[1] There were few cases among Servicemen or in the general adult population, but half the children at some schools were attacked. Two boys had consecutive attacks of B and A influenza with an interval of 2–3 weeks between—the first time this has been recorded. Active investigation of the phenomenon of red-cell agglutination by virus has already produced results which may have important theoretical and practical implications. It appears that the hæmagglutinin of vaccinia and ectromelia viruses is a stable complex of a phospholipid (probably lecithin) with an antigenically specific product of the virus. It also seems likely that the action of viruses of the influenza group may uncover new antigenic groupings on the cell surface. A better skin-testing reagent has been devised for the diagnosis of herpes simplex; the substance is easy to produce and does not cause non-specific reactions in non-herpetic people.

While much of the report is necessarily concerned with virus work the institute has been active in other fields. In association with American workers North Queensland tick typhus is being studied, and trials on the preventive effect of gamma globulin in measles continue. The department of experimental medicine is tackling the epidemiology of ectromelia in mice, and work has started on the serology of oriental schistosomiasis and malaria. With the opening of a clinical research unit at the Royal Melbourne Hospital there will be new opportunities which Dr. F. M. Burnet, F.R.S., and his colleagues can be relied on to seize.

NEONATAL DIARRHŒA

IN the last few weeks there has been a small but highly fatal outbreak of neonatal diarrhœa in the maternity wards of two hospitals in Leicestershire, and as a result the much milder outbreaks and isolated cases arising elsewhere have been viewed with unnecessary alarm. Figures for neonatal deaths alone are not available, but it is reassuring that the number of deaths from gastro-enteritis under 2 years of age has been no higher than the average in the first 11 weeks of this quarter. Nevertheless, the Leicester experience, in which nearly half the affected children have died, shows that the advent of chemotherapy and the antibiotics, and modern methods of studying viruses, have done little to reduce the case-mortality from this disease, though thanks to improvements in social conditions and infant care generally we no longer see the great epidemics of infantile diarrhœa which swept the country 50 years ago.

Apart from the diarrhœas of known origin which affect children and adults alike—food-poisoning and bacterial dysenteries—and the diarrhœas secondary to parenteral infections, there are at least two forms of infantile gastro-enteritis of undetermined causation prevalent in this country. The first is usually mild (though infants, especially if bottle-fed, may die of it), affects adults at least as often as children, occurs sporadically in hospitals and other institutions over months or even years, and is known to the public as gastric flu. The second is highly fatal, with a case-mortality rising as high as 80–90%, attacks infants in the early weeks of life, appears gradually or suddenly in maternity wards and nurseries, and is the true epidemic neonatal diarrhœa. An example of the mild type is the recent outbreak at Cowley Road Hospital, Oxford. There a mild gastro-enteritis has been prevalent in this temporary maternity home since the beginning of July, but, though 29 babies are known to have been affected up to Nov. 29, when the home was closed, there have been no deaths, and only one baby has been ill enough to need hospital treatment. A significant feature of this outbreak has been an attack-rate of about 60% among the mothers of the affected babies and of 19 out of 21 among the midwives and nurses in the home. The main symptom has been diarrhœa of 2–4 days' duration, and repeated examination of stools has so far failed to reveal any causative organism.

At Leicester General Hospital it seems possible that both types have been present, for there have been sporadic cases of mild diarrhœa among the mothers since early September, and there were 13 severe cases in the babies, 5 of them fatal, in the three months up to Dec. 4. Then within a few days there was a typical explosive outbreak of the fatal type, involving 25 babies in a few days, with 12 deaths.

The cause of both types remains unknown. According to Crowley and colleagues,[1] who studied three outbreaks in 1941, the choice lies between (*a*) infection with an organism of the salmonella or dysentery group, or with a normally non-pathogenic bacterium, or with a pathogenic organism that does not develop well in culture; (*b*) a toxin formed by an organism in the intestine; (*c*) a bacterial toxin ingested with the food; (*d*) a systemic infection with an unknown organism; (*e*) infection with a virus; or (*f*) a protozoon. Those called on to deal with tagious and infectious, with an incubation period of 12–21 days.

---

[2] Infestation Control: Rats and Mice. H.M. Stationery Office, 1946. Pp. 36. 1s. 6d.

[1] Burnet, F. M. *Lancet*, 1946, i, 807.

[1] Crowley, N., Downie, A. W., Fulton, F., Wilson, G. S. *Lancet*, 1941, ii, 590.

There are already several known causes of lymphocytosis in children. Kato pointed out that from three months to four years of age lymphocytes are normally more numerous than polymorphs. A well-marked lymphocytosis has been recorded in whooping-cough, rubella, and mumps after the initial stage. Infectious mononucleosis is common in children, and it is likely that several cases of infectious lymphocytosis have been classified with this disease—for example, Thelander and Shaw's[7] cases of infectious mononucleosis with signs of meningeal irritation, which had a lymphocytosis and negative Paul-Bunnell tests.

Here, then, is a benign almost certainly infectious condition, mainly affecting children, with a very variable clinical picture, sometimes simulating acute abdominal or nervous disease at onset, and sometimes only a mild respiratory tract affection; pyrexia may be protracted, and the blood shows a pronounced lymphocytosis. The Paul-Bunnell reaction is not significant. The differential diagnosis from infectious mononucleosis (glandular fever) may turn on the Paul-Bunnell reaction—not an entirely reliable sign—but the blood picture in infectious lymphocytosis shows only small lymphocytes, with no glandular fever cells or excess of monocytes. In lymphatic leukæmia the patient is much more ill and has a rapidly increasing anæmia, and sternal puncture always shows a massive lymphocytic infiltration.

The prognosis in infectious lymphocytosis is excellent, even if the course is long; no specific treatment has been proposed. The cause has not been identified; it has, as usual, been ascribed to a virus, but no supporting evidence has appeared yet.

NUTRITION IN CEYLON

THE peasants of the Middle East, we are told,[1] "constitute the bulk of the population and . . . produce most of the basic wealth, have few schools, almost no medical facilities, till soil that is not their own, have little purchasing power, and exist under standards that are tragically low." This dismal statement applies also to Ceylon, as is shown in a publication of the department of medical and sanitary services.[2] The basic wealth of the country is derived from the chief exports—tea, rubber, and coconuts. The food that is grown in Ceylon can support barely a third of the population. For her rice Ceylon depends on Burma and for other foodstuffs on India. During the late war, when Burma was occupied and India was facing a famine, Ceylon had to turn to Australia for wheat and other foodstuffs. She has few or no cottage industries to help the peasant population and occupy their time when idle. That the diet is bad there can be no doubt. The state of nourishment is so poor that it is impracticable to use modern European and American standards. Any standards accepted must be based on those ensuring reasonable (not "abounding") health, and often these low standards are not achieved. In 1944, 40% of the families examined were obtaining too few calories (standard, 2000 a day !), 65% too little protein, and 54% too little calcium. Toad-skin and Bitot's spots in the children examined pointed to gross deficiency of vitamin A, and there was evidence of a lack of the B vitamins. The average cost of the diet before the war was 15 cents a day. It had risen to 38 cents in 1944, and nearly two-thirds of the people spent less than this amount. The death-rate is 20 per 1000 and the infantile mortality close on 140 per 1000 live births. Despite these figures the population has risen and is still rising. In no direction are there any grounds for complacency, though there is a little comfort in the fact that things are not as bad as they were in 1937. That the prospects are so unpleasing is not because man is vile but because man, the entrepreneur, has exploited the land and its resources and paid no real attention to the welfare of those w produce most of the basic wealth of the island. It w need a long-term plan of primary, secondary, and ad education, agricultural improvement, supply of medi services, and improvement of the standard of livi with or without a short-term policy of world agricult organisation, to remedy the deplorable state of the pub health in Ceylon.

DOCTORS DIFFER

A BOOK with this title seems in tune with the time and though Dr. Harley Williams[1] deals with histo rather than current differences—and not merely diff ences of opinion but of quality and character— argument is opportune, for he shows that through t differences of doctors medicine grows. There is nothi new about this: the energy generated by opposit moves many things in nature, as British party polit show. But he sets about it with enthusiasm, and h rattling pen and vivid fancy get the circulation going his ten subjects and put them before us as live men though not necessarily quite the men who walked t earth under those ten names. He is deeply read in t debates of Elliotson and Wakley over mesmerism, the lives of old Hugh Owen Thomas and young Robe Jones, of plodding Mackenzie and quicksilver Osler, Macewen and Victor Horsley, and urbane Robert Willia Philip and country-loving Trudeau. His portraits a in the main kindly, even flattering. Sometimes indeed must have shared the perplexity of Mrs. Gaskell fac with the task of writing acceptably of the Bront the great can be so awkward. Is it true, for exampl as Dr. Williams puts it, that "some admiring nurs subscribed secretly and bought a fish-kettle for Macew to boil his forceps"? Or did the sister exclaim, one da "He's been on about that fish-kettle for weeks. F heaven's sake let's buy him one"? If this kind of dou afflicts the reader from time to time it will not impa his enjoyment of stories which revive the times as w as the men. He does less than justice perhaps to Thom Wakley, founder of this journal; and in his relish of t pomposities of Philip he seems for a moment to shed som of his own years and to become one with the irreveren students who enjoyed them.

CONTROL OF RATS AND MICE

THE immense importance of rats and mice as carrie of disease and destroyers of food is perhaps not sufficientl realised in this country. *Rattus rattus*, the "black" o "ship" rat, was the earliest invader of Europe, comin from the East shortly after the Crusades, probably b ship. This settler spread rapidly, but was eventuall almost entirely replaced by *Rattus norvegicus*, the large short-nosed, short-tailed common brown rat, as a resul of a strange revolution in the rat world which took plac towards the end of the seventeenth century. Prof. G. M Trevelyan[1] claims this change-over as the chief caus of the decline of the plague of 1665, because the brow rat did not carry the plague-flea to nearly the sam extent as its predecessor. It is certain that between them they have been responsible for an incalculable number of deaths from plague and typhus, and also for the spread of such infections as rat-bite fever and Weil's disease. The 40,000,000 rats in England at present are

---

[7] Thelander, H. E., Shaw, E. B. *Amer. J. Dis. Child.* 1941, 61, 1131.

[1] Allen, H. B. *Rural Education and Welfare in the Middle East.* H.M. Stationery Office. 1946. 1s. 6d.

[2] *Ceylon Health News,* 1945, 12, no. 2.

[1] Doctors Differ. By Harley Williams. London · J Cape. Pp. 253. 12s. 6d.

[1] English Social History, London, 1944, p. 300.

Special Articles

HE STILLBIRTH-RATE IN ENGLAND AND WALES IN RELATION TO SOCIAL INFLUENCES

IAN SUTHERLAND
B.A. Camb., F.S.S.
From the Institute of Social Medicine, Oxford

THOUGH the importance of reducing the death-rate infants is receiving more and more attention, that reducing the numbers of stillbirths, which is just as nportant, has not had nearly so much notice.

Each year in England and Wales there are about 0,000 stillbirths, 18,000 neonatal deaths (of infants nder four weeks of age), and 15,000 deaths of infants ged from four weeks to a year. This total of 53,000 xceeds the combined deaths from heart disease and ancer in persons under sixty years of age, and is more ian double the number of deaths from pulmonary iberculosis at all ages. But it has a biological signifiance not fully indicated by a mere recital of comparave figures, because a child has at birth an expectation f life of some sixty years. These 53,000 are not able fulfil that expectation. They represent a wastage of otential life which can be ill afforded in view of the eclining birth-rate.

During the past forty years, as is well known, there as been a notable decline in infantile mortality. ut this decline has not affected all age-periods ithin the first year equally. The changes that have aken place during the typical period 1930–38, with the orresponding figures for the stillbirth-rate, are as ollows :

	1929–31	*1937–39*	*Decrease*
tillbirths per 1000 total births ..	40·56	38·36	5%
eaths per 1000 live births—			
at ages under 4 weeks	31·78	28·71	10%
" " 4 weeks to 3 months ..	10·68	8·47	21%
" " 3– 6 months	9·28	7·50	19%
" " 6– 9 months	7·91	5·11	35%
" " 9–12 months	7·24	3·74	48%

he bulk of the decrease has taken place at ages from our weeks to twelve months, whereas neonatal mortality nd the stillbirth-rate have shown only slight decreases. t is well recognised that mortality at ages 3–12 months closely associated with bad environmental conditions, nd its decrease has been attributed to improved housing, ygiene, and the educative value of child welfare services. he Registrar-General (1937) has shown that this nortality in 1930–32 was 6·7 in the most favoured social nd economic group in the country, and 31·4 in the least avoured—a figure over 4½ times as great This gradient f the mortality with social class indicates its sensitivity o environmental conditions. But neither neonatal leaths nor stillbirths exhibit nearly so marked a correlaion, and for this reason research is urgently necessary nto the causes and factors predisposing to this wastage f life. This paper is concerned with stillbirths only, ith particular reference to social influences.

STILLBIRTH-RATE IN ENGLAND AND WALES

Stillbirths (which have been notifiable to the local nedical officer of health since 1915) have been registered n this country since July, 1927, in accordance with the Births and Deaths Registration Act, 1926, which includes he following definition : "'Stillborn' and 'stillbirth' hall apply to any child which has issued forth from its nother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show any other signs of life." Registration was extended to Scotland in 1939. In Denmark stillbirths are also registered and the definition of a stillbirth is the same as in this country.

In 1939 the stillbirth-rate in England was 37, in Scotland 42, and in Wales 49 ; the rate in Denmark was only 26·5. These figures are typical of the differences between the four countries and show that there is room for considerable improvement not only in Wales and Scotland but also in England, where the geographical incidence varies widely. The stillbirth-rate was calculated for each county borough, London borough, urban district, and rural district in England and Wales for the twelve-year period 1929–40, during which time the rate did not fluctuate much in the whole country, and the results are summarised in table I. The first 1½ years of registration were omitted in case some stillbirths initially escaped registration.

The statistical experience in Wales and London affords an interesting contrast. Every region in Wales returns a higher rate than the average for England and Wales, and with one exception (Holborn) every London borough returns a rate below the average. It is clear from the table that the stillbirth-rate does not increase with increasing density of population. In this respect it is dissimilar to infant mortality, and this implies that different causal factors are involved.

TABLE I—UNWEIGHTED MEAN STILLBIRTH-RATES WITH STANDARD ERRORS IN CERTAIN GROUPS OF REGIONS, 1929–40

District	*No. of regions*	*Stillbirth-rate*
London boroughs	28	31·95 ±0·51
County boroughs (England)	79	41·56 ±0·48
County boroughs (Wales)	4	50·68 ±4·73
Urban districts (E)	47	38·31 ±0·65
(W)	12	51·91 ±1·51
Rural districts (E)	47	37·63 ±0·61
(W)	13	62·58 ±0·95

The City and Temples, Rutland and Radnor urban districts, and Middlesex rural district were omitted from the above analysis owing to the smallness of their experience.

The trend in the rate has already been described (Sutherland 1946), and it may be of interest to recapitulate its main features. There was a slight rise until 1932 or 1933, followed by an increasingly rapid decline. This decline has not been halted during the war years ; on the contrary, it has accelerated greatly since 1939, particularly in areas with high incidence. The rate in Wales as a whole declined by 34% between 1938 and 1944. In England the decrease was 27%. There has been a similar decrease in Scotland. Possible causes of this decline are discussed below.

CERTIFIED CAUSES OF STILLBIRTHS

In Scotland, but not elsewhere, a statement of the supposed cause of stillbirth is required on the certificate. Table II gives an analysis of the registered causes of stillbirths in that country in 1943, when the registration procedure had become well established. The table is instructive in two respects : (1) 7% of the stillbirths are inexplicable in terms of present medical knowledge, and 12% are assigned to vague causes, such as prematurity or atelectasis, which terms describe the fœtus but do not explain why the child was stillborn ; and (2) the categories "difficulties in labour" and "accidental hæmorrhage," which include 33% of the stillbirths, represent those which greater obstetric skill may help to prevent. It is thus clear that, though it has an

TABLE II—CERTIFIED CAUSES OF STILLBIRTHS—SCOTLAND 1943

Cause	*No.*		
General diseases of the mother	116	*(3%)*	
Toxæmias	338	*(10%)*	
Fœtal deformities	596	*(17%)*	
Difficulties in labour	910	*(26%)*	*(33%)*
Accidental hæmorrhage	239	*(7%)*	
Other defined causes	621	*(18%)*	
Ill-defined causes—e.g., prematurity ..	431	*(12%)*	*(19%)*
Unknown causes	243	*(7%)*	
	3494		

or investigate outbreaks will have in mind the incident reported last year by Brown and colleagues,[2] in which the maternity department of a general hospital appeared to have been affected as a result of a widespread outbreak of minor gastro-intestinal upset in the surrounding neighbourhood. In this instance, as in many others, pathological and bacteriological findings were completely negative. In the outbreak reported by Freedman[3] this year the search for a causal organism included tests for protozoa, but without success except in a single case in which *Giardia lamblia* was isolated. On the other hand, this mild gastro-enteritis in a midwifery block was apparently cured and then controlled by the administration of mepacrine, which was given in doses of 0·1 g. t.d.s. for five days to all residents, including staff and mothers, whether ill or not. The baffling feature of most outbreaks of the mild and severe type is this failure to isolate a causal organism. Only very occasionally can these incidents be ascribed to infection with pathogenic bacteria or protozoa. The most plausible explanation is, of course, that the infecting agents—and there may be several of them—are viruses, of which one at least is relatively non-pathogenic for adults but highly virulent in infants. Another possibility is that the common bacteria of the human intestinal tract—*Bact. coli, Strep. fæcalis,* and the like—may have unsuspected pathogenic potentialities, particularly in the unstable condition of the infant's intestinal tract during the first few weeks of life. Such hypotheses are not easily put to the test in the anxious atmosphere of a maternity ward suddenly threatened with a wholesale loss of infant lives, yet on the satisfactory solution of this problem largely depends the future of institutional midwifery.

As regards prevention in maternity nurseries, Sakula[4] urges breast-feeding whenever possible, strict attention to the hygiene of bottle-feeding, and the avoidance of overcrowding, with an ample staff of well-trained nurses under the supervision of a pædiatrician. But outbreaks do arise even where these precautions are most strictly followed.

CHEST DISEASE IN RAND MINERS

In South Africa measures are being taken to protect the miner against silicosis and pulmonary tuberculosis, and the success obtained is reflected in the report on the work of the Miners' Phthisis Medical Bureau for 1941–44. The much stricter physical selection of recruits for the mines, better ventilation, improved machine drills, &c., have combined to reduce the dust hazard and have halved the incidence of silicosis since 1927. The average length of service underground preceding diagnosis of silicosis has risen from eleven years in 1927 to twenty-one years in 1944, reflecting the general improvement in mining conditions. The miners are examined every three years, after an initial examination when a certificate is given to show that the candidate is free from any disease of the lungs and is in other respects physically fit for underground work. This initial examination is a stiff one, and about 1 in 5 of the applicants are not accepted.

Compensation is run on the following lines. If a miner is found to be suffering from silicosis he is given the choice of taking an award and stopping work underground or continuing to work and postponing the award. If the disease advances in severity from ante-primary or primary to secondary stage he is given a pension. In 1944 the Miners' Union complained that the number of silicotics transferred to the secondary (and therefore pensionable) stage was steadily falling. This seems to have been due to several factors, such as stricter initial examination, improved mining conditions, and fewer cases complicated by tuberculosis—in other words, the state of things is improving. The report says emphatically that silicosis, once contracted, need not necessarily progress towards incapacity and death, and in fact many men certified as silicotics before 1916 are still in the early stages and in relatively good health. That silicosis is not a disease peculiar to those working underground is illustrated by 39 drill-sharpeners working above ground; all these men had X-ray appearances similar to those found in silicosis and arising from the presence of significant quantities of silica and iron oxide dust in the air which they breathed. On the subject of treatment nothing new is said. The Rand docto agree that not enough work has yet been done on t aluminium treatment of silicosis, and their ma emphasis is laid on methods of prevention, such improved dust control.

Tuberculosis is not a common disease among Europe miners in the Rand, and the incidence has fallen 0·7 cases per thousand each year. The association tuberculosis and silicosis, however, is more frequen though this again has dropped, mainly owing to t fact that any miner found to have tuberculosis is oblig to stop underground work. In native workers t incidence of tuberculosis actually exceeds that of silicosi thus confirming the well-known fact that native mine are unduly susceptible to tuberculous infection. N form of mass radiography has yet been introduce though it is likely that this will be done in the ne future.

EDITOR OF THE "BRITISH MEDICAL JOURNAL

At the end of this year Dr. Gerald Horner vacates t editorial chair of the *British Medical Journal,* which l has held since he succeeded Sir Dawson Williams in 192 The doyen of medical journalism in this country, h experience in our small specialty dates from 1911, whe he joined the staff of *The Lancet* as assistant edito From 1915 to 1917 he served with the Royal Army Medic Corps, chiefly in France, and on demobilisation l accepted the post of second-in-command to Dawso Williams. The subsequent years have seen a va increase in the number of the journal's readers, and the are indebted to Dr. Horner more than they know. Hi love of accuracy, his sincerity, and his fairness have s high standards for his fellow specialists, and his whol work bears the mark of a cultivated mind familiar wit the great past of medicine, of which the present i an extension. We can only regret that the continuou labour of marshalling other people's words has too ofte hindered him from giving us his own. Leisure, we hope will free a pen which can write beautifully with ink o almost any pH. Meanwhile on his retirement thousand of colleagues who have called on Dr. Horner or hav corresponded with him will recall particularly his kindnes and his constant desire to help.

We warmly welcome to the editorship Dr. Hugh Clegg who joined the *British Medical Journal* in 1931 and ha been deputy editor since 1934.

THE REGIONS

The Minister of Health has lost no time in defining the hospital regions under the National Health Service Act. On Dec. 20, having examined comments from 200 bodies on the proposals published in our issues of Nov. 30 and Dec. 7, he laid an order before Parliament. Though amended here and there, the scheme in outline remains as it was, and London will be split into four metropolitan areas. Mr. Bevan has told local organisations that though the Welsh region will remain a single unit it will be centred on Liverpool University as well as Cardiff.

Dr. N. M. Goodman, director of the health division, European regional office, Unrra, has been appointed director of field services for the Interim Commission of the World Health Organisation, at Geneva.

---

[2] Brown, G., Crawford, G. J., Stent, L. *Brit. med. J.* 1945, ii, 524

[3] Freedman, B. J. *Ibid*, 1946, ii, 552.

[4] Sakula, J. *Lancet*, 1943, ii, 758.

It is clearly necessary to test the validity of these ypotheses by seeing if they can explain the pre-war eographical distribution of the rate. In view of the nterplay of opposing factors the best method to employ s that of multiple regression. Two groups of areas were hosen for analysis: the 83 county boroughs in England nd Wales, and the 48 English administrative counties excluding London). For each the multiple regression ested whether the five chosen variables could account or the observed variation in the stillbirth-rate, and measured the importance of each variable independently.

Before the effect of social influences can be assessed, the variation due to biological factors must be allowed for. Many of these factors will make only a very slight contribution. The sex-ratio at birth shows little consistent geographical variation over long periods In 1939 the mean age of mothers giving birth differed inappreciably n the twelve main divisions of the country. Proportions of illegitimate births are small and so cannot cause great variations. The important factor is the parity of the mother, and the main contrast is between primiparæ and multiparæ. The proportion of first births is only obtainable for the twelve main divisions of the country; so some other closely associated index must be used in the multiple regressions. Two possibilities were considered: the crude birth-rate, and the census figure of persons per family. Both give high negative correlations (−0·62 and −0·75 respectively) with the proportion of first births. The crude birth-rate was chosen as more relevant, since the census figure will be disturbed by relations living with the family.

Four variables were used to specify social and economic environment. The sensitivity of the mortality of infants aged 3–12 months to environment has already been illustrated, and so it was used as a general index of poor social and economic circumstances. It is known that unemployment, overcrowding, and poorly paid jobs are all factors relevant to infantile mortality, and indices of these three were used to assess the independent effects of specific aspects of the environment. The five variables were thus taken as:

TABLE IV—WAR-TIME CHANGES IN THE STILLBIRTH-RATE IN ENGLAND AND WALES

Year	Legitimate		Illegitimate		Age of mother			Parity of mother				All multiparæ
	M	F	M	F	20–24	30–34	40–44	No. of previous children				
								0	1	2	5	
1939	39	35	50	44	26	39	68	40	24	31	45	33
1940	37	34	48	48	25	37	66	37	23	28	46	31
1941	36	32	48	43	24	34	63	35	23	28	42	30
1942	34	32	41	41	.	..	..	..	..	.	..	..

Rates for 1941 and 1942 are based on *occurrences*, not registrations.

x_1=Crude birth-rate in 1931.

x_2=Proportion of occupied males over the age of 14 years in social classes IV and V, 1931 (Registrar-General 1934).

x_3=Mortality at 3–12 months (1933–37) (Registrar-General 1937).

x_4=Persons per room in private families, 1931 (Registrar-General 1934).

x_5=Men out of work as a percentage of those occupied, 1931 (Census of England and Wales 1931),

and the multiple regression of the stillbirth rate (1929–40) on these five was calculated The results were:

County Boroughs (England and Wales)

$$Y=38{\cdot}7-2{\cdot}14x_1+32{\cdot}7x_2+0{\cdot}449x_3+13{\cdot}0x_4+0{\cdot}319x_5.$$
$$R=0{\cdot}739 \quad 1\text{-}R^2=0{\cdot}454.$$

Administrative Counties (England)

$$Y=42{\cdot}8-0{\cdot}752x_1+5{\cdot}63x_2+0{\cdot}932x_3-19{\cdot}9x_4+0{\cdot}722x_5.$$
$$R=0{\cdot}711 \quad 1\text{-}R^2=0{\cdot}495.$$

The advantage of these equations is that they afford a means of estimating the stillbirth-rate from the five variables and with a higher degree of precision than if the information given by the variables had not been available. For the administrative counties the estimate is made with 26% more precision, and for the county boroughs with 30%.

In the equations the coefficient of each variable represents the increase expected in the stillbirth-rate for unit increase in that variable, independently of changes in the other variables. Since different units of measurement are used, the relative importance of the coefficients is not indicated by their absolute values. The appropriate test shows that for the county boroughs, the coefficients of x_1, x_2, x_3, and x_5, and for the administrative counties the coefficients of x_3 and x_5, are all highly significant. The others are not significant.

The interpretation of these findings accords with the hypothesis outlined above. In the county boroughs the stillbirth-rate is affected both by unemployment and by the prevalence of poorly paid jobs, both of which are responsible for poor nutrition. Moreover, it is well known that, if food is short, it is the mother who stints herself to feed her husband and family; hence the consequences of unemployment and low pay fall most heavily on her. Physical overcrowding, on the other hand, which is not in itself a cause of malnutrition, shows no relation with the stillbirth-rate. The significant value for the coefficient of x_3 indicates that, apart from overcrowding, unemployment, and poorly paid work, there are other environmental factors affecting the rate which still need investigation. The significant negative coefficient of x_1 indicates clearly that the parity effect masks the importance of the social and economic environment.

In the smaller experience of the administrative counties the picture substantially agrees with that for the county boroughs. The effect of unemployment and of the unspecified environmental factors is plain. It is interesting that the coefficient for the poorly paid work is not significant. This may be due to the fact that in the administrative counties the workers in social classes IV and V are to a large extent agricultural, and so there might not be the same degree of malnutrition associated with low pay as in a more industrial area. Here too overcrowding does not show itself to be important. The coefficient of x_1 is negative, and so, though it is not significant, it serves its purpose of making some allowance for variations in parity.

Antenatal care has not been assessed directly in the above analysis (though x_3 may account for it to some extent). The omission is due more to the difficulty of measuring it than to neglect of its importance. Obviously it is important, as can be judged by a comparison of the stillbirth-rate in Wales with that in London. It was shown previously that the rate in the former was much greater than that in the latter. It is now apparent that the variables used in the regression equations are insufficient to explain this difference, since they give the following predictions for county boroughs in the two areas:

Stillbirth-rate, 1929–40

	Predicted	*Actual*	*Difference*
Croydon	33·4	31·2	−2·2
East Ham	40·1	32·6	−7·5
West Ham	48·5	31·7	−16·8
Cardiff	41·4	47·3	5·9
Merthyr Tydfil	54·5	63·4	8·9
Newport	42·1	40·9	−1·2
Swansea	43·1	51·1	8·0

The three county boroughs in Greater London all have rates less than those predicted, and three of the four *important part to play, obstetric skill is by no means all-important,* and that in 19% of cases the practitioner registering the stillbirth is unable to assign it to a definite *medical cause. This shows that the problem is more* than purely medical or obstetrical. Basic causes must be sought elsewhere, and in this connexion consideration must be given *to the deaths in the first month of life,* because it is generally accepted that the problem of neonatal mortality is allied to that of stillbirths. But *an examination of the certified causes of neonatal deaths* does not help to elucidate the causation of stillbirths, because in early infancy the certification must often be vague.

BIOLOGICAL FACTORS

There are several biological factors affecting the stillbirth-rate, of which the most important are the age and parity of the mother. It is convenient to regard these two together, since a woman's parity is not independent of her age. When the births are classified according to the number of previous children born, the stillbirth-rate within each group shows a well-marked association with the age of the mother. There is a possible slight decrease up to the age of 25, but thereafter the rate increases more and more steeply. When the data are allocated according to the age of the mother, there is in each age-group an appreciable decline between the rates for the first and second child. For the third and subsequent *children born to mothers of the same age the rate shows* a tendency to rise again, but not so high as the rate for the first child, except in the case of young mothers with unusually large *families.* To sum up broadly, *primiparæ* have a higher stillbirth-rate than multiparæ of the same age, and the rates for both increase after the age of 25. A representative series of values is given in table III.

An interesting example of the importance of age and parity is afforded by the statistical experience in the London boroughs. It is generally accepted that in better-class districts the mothers are older and the proportion of first births high, as compared with poor-class neighbourhoods, where the mothers are younger and have larger families. The London boroughs were classified into four groups according to "social index," which is a measure, based on the Registrar-General's five social classes, of the general social and economic level of the borough (Cheeseman 1938). Group 1 comprises Hampstead, Holborn, Kensington, Lewisham, Paddington, Stoke Newington, Wandsworth, and Westminster, which have the highest social indices. Group 4 consists of Bermondsey, Bethnal Green, Finsbury, Poplar, Shoreditch, and Southwark. Groups 2 and 3 are intermediate. The stillbirth-rate in the four groups for three successive triennia are as follows:

Year	*Group* 1	2	3	4
1928–31	35·1 ..	32·9 ..	32·6 ..	30·9
1932–34	33·1 ..	31·3 ..	31·4 ..	31·3
1935–37	33·6 ..	32·3 ..	32·0 ..	30·9

In group 1 the rate is consistently higher than in group 4, with 2 and 3 falling between. The inverse relationship with social status is seemingly due to the age and parity distribution of the mothers being relatively unfavourable in the better-class districts, and favourable to a low rate in the poor-class districts. Any adverse effect of environment is masked by these biological factors.

SOCIAL INFLUENCES

The possible causes of the decrease in the stillbirth-rate during the war years may now be considered. First, such a pronounced decline cannot be attributed entirely to improved obstetrics. Hospitals and maternity homes were overcrowded, there was a shortage of doctors, and those available were overworked. Moreover, it has been shown that, according to the Scottish data, improved obstetrics could only affect about a third of the stillbirths. Yet the decline in Wales has been of this ord and there is no evidence that Welsh obstetrics becam perfect during six years of war. Secondly, the decl is not due to changes associated with the biologic factors, because table IV shows that it has affected bot male and female births, legitimate and illegitimate, and mothers of all ages and parities. *Figures later tha* those quoted are not yet available. A decline so universa in all respects must have a universal cause.

TABLE III—STILLBIRTH-RATES FOR LEGITIMATE SINGLE BIRTH BY AGE AND PARITY OF THE MOTHER, ENGLAND AND WALES JULY, 1938, TO DECEMBER, 1940

Age of mother (years)	Number of previous children				All multiparæ	All paritie
	0	1	2	5		
20–24	29	18	22	26	19	26
30–34	54	26	30	38	31	38
40–44	*105*	*56*	*55*	*67*	*64*	*68*
All ages	39	24	30	46	32	36

This cause must therefore be sought in the social an economic environment of the pregnant woman. In view of the rather static character of the stillbirth *rate and neonatal mortality during a period when the* was an appreciable decline in the mortality in the late ages of infancy—a decline commonly ascribed to improve*ment in the general environment*—this may seem *a priori* an unprofitable line of inquiry. But it must be appreciated that the word environment connotes a *multiplicity of factors, some adverse, some (like the age* parity effects) favourable to a reduction in the stillbirth-rate. For that reason the influence of the individual factors must be studied separately. The necessity fo doing so is indicated by the findings of Baird (1945), in Aberdeen, who has clearly shown that not only obstetric care but also social environment influences the stillbirth-rate, and *that social environment is, if anything,* the more important.

In many respects the environment of the expectant mother deteriorated during the war. The strain and anxieties of life increased, particularly in the towns, with overcrowding, bombing, queueing, separation of families, and other additions to the housewife's duties and responsibilities. Moreover, married women worked in industry *to a greater extent than ever before.* All these are factors which might well be expected to have increased the rate. To offset these influences are two which have improved notably and universally for the pregnant woman: general nutrition and antenatal care. Priority milk and eggs, supplementary vitamins, and, later in the war, other extra rations were made available universally, for the first time, to the expectant mothers of all income-groups; and, *pari passu* with this official concern of the Ministry of Health and Ministry of Food for maternal nutrition, went increased earnings, the expansion *of antenatal clinic facilities,* and widespread propaganda for their use. It is tempting to conclude that the foregoing factors were mainly responsible for the decline in the stillbirth-rate. The nutritional standard set throughout the country would explain why the worst areas of the country have shown the most *improvement and, as a consequence, have rendered the* experience of the whole country more uniform. Improved *nutrition would raise the general level of health of the* mother and make her better able to support the growing fœtus. Further, the investigation of the People's League of Health (see *Lancet* 1942) has shown *notable decreases* in the incidence of toxæmia consequent on nutritional improvements. It has been shown above that in Scotland 10% of stillbirths are attributable *to this cause.*

isolated and is isolating represent only a small percentage of the protein in the aqueous muscle extract used, which in turn represents only a fraction of the total muscle proteins.

ENZYMATIC SYNTHESIS OF POLYSACCHARIDES

In his second lecture Professor Cori described how he had synthesised in vitro such natural products as glycogen and amylose, and showed that the products were in every way identical with the natural compound. Using the techniques of high polymer chemistry, he worked out in great detail the kinetics, autocatalytic behaviour, &c., of the reactions involved. He was able to determine the chain length of the polymer molecule at every stage of the synthetic process, as well as the necessary chain length of the initiating molecules.

At the end of this lecture Professor Cori touched on the wider significance of his work, when he discussed the old question, “What makes these metabolic cycles go round?” In other words, he brought up the question of the hormonal control of carbohydrate metabolism, which, he said, “has hitherto yielded inconclusive results.” At his stage he divulged some new and highly interesting ndings. As is well known, glucose enters the “meta-blic mill” by virtue of its phosphorylation to glucose-6-phosphate, called the Robison ester. This reaction is catalysed by the enzyme hexokinase. When insulin and other hormones have been added to such an enzyme system in the past, no conclusive results could be obtained. In Professor Cori’s laboratory muscle tissue was taken from animals which had been rendered diabetic by means of alloxan, and it was found that here the phosphorylation of glucose was impaired and that this inhibition could be countered by insulin. Furthermore, since it is known from the work of Houssay that the diabetes of depancreatised animals is ameliorated by removal of the pituitary, Professor Cori tried the effect of pituitary extracts on the hexokinase system. The results showed that some pituitary extracts inhibited the hexokinase system even further and that this effect was again counteracted by insulin. Much the same applied to adrenal extracts, as was to be expected from the work of Long on the influence of the adrenal cortex on diabetes. Here at ast seems to be the long-awaited linkage between hormones nd enzymes in the field of carbohydrate metabolism.

BRITISH EMPIRE CANCER CAMPAIGN

ANNUAL GENERAL MEETING

THE annual meeting of the Campaign was held in London on Dec. 19, under the chairmanship of Viscount Hailsham, the acting president. A message was received from the Duke of Gloucester, the president who welcomed the Campaign’s continued activity.

Sir Stanford Cade moved the adoption of the annual report which, he said, is the 23rd of a consecutive series recording nearly a quarter-of a century’s progress in cancer research. The Campaign correlates controlled research, helps individual workers in recognised centres, disseminates knowledge, and helps to destroy the fear of cancer. To further these aims a *British Journal of Cancer* is shortly to be published.

The best yardstick of progress is the yardstick of mortality. Deaths from cancer in accessible sites and in ome internal organs have decreased, while in other ites the peak of the rise has not yet been reached. Some may think that cancer research is about to become lely a State responsibility. Nothing, however, is rther from the truth. Pioneer and research work will still depend on the efforts of individual research-workers; and further work and further progress will depend on the subscribers.

The motion was seconded by Mr. E. R. B. Graham.

The Campaign’s Garton medal and prize of £500 was presented to Prof. E. L. Kennaway, F.R.S.

The annual report will be summarised in a later issue.

MR. R. LINDSAY-REA, surgeon to the Western Ophthalmic Hospital, London, has received a presentation from his colleagues on his retirement. He has been 25 years on the staff of the hospital.

In England Now

A Running Commentary by Peripatetic Correspondents

IT is often said to be impossible to work for higher degrees while serving in the Forces. This is nonsense. With an Army grading in surgery and no civilian specialist qualifications, I realised that I must seriously set to work for my Fellowship. And when the demobbing of specialists was slowed down this became still more important. I started to work for the Primary in March, and managed to confound the examiners seven months later. During this time I was stationed in Germany, and had no fewer than ten moves. Only once or twice was I able to visit the anatomy department at Hamburg University. What dissection I did was in the operating-theatre and the post-mortem room.

Bones were a difficulty at first. I foolishly sold my skeleton when, as a student, I thought I had finished with anatomy for ever. But steadily a skeleton was assembled. One bone was found here, another there. The skull had been used in festivities at a sergeants’ mess party; it had a glass eye and a fine set of false teeth. A first thoracic vertebra, with two first ribs attached, was very nice—but the ribs were both upside down. The wrist was articulated with its various bones in the right order, but there had been no attempt at correlating the various surfaces. In the foot the third and fourth metatarsals were interchanged. And the fibula! I had always regarded it as the most aggravating of bones, but this one baffled me completely. I puzzled over it for fully half an hour before I realised that it was articulated upside down. So much for German thoroughness. One whole suitcase had to be sacrificed to my skeleton, and clothes only served to stop the bones from rattling. It accompanied me wherever I went, and many a batwoman must have paled at the gills when she came to do my unpacking.

Books are a menace to cart around, especially tomes like Gray, and Best and Taylor. For the anatomy I made two real finds. One was Frazer’s *Osteology*, and the other Jamieson’s *Illustrations*. I had used neither before, and both helped immensely. After reading Frazer, in particular, I think I can appreciate how Keats felt when first he looked into Chapman’s Homer. For the applied physiology I found Best and Taylor a scholarly work, beautifully written and a real pleasure to read.

The exam itself was quite straightforward—fair papers and gentlemanly vivas. But it strikes me as very hard that you cannot get special leave for exams, or at least have your privilege leave extended. It certainly benefits the Army to have its specialists well qualified. But no matter—I shall soon be demobbed, and I had a glorious bonfire of all my notes.

* * *

Nothing is more distasteful to the doctor than to have some outside body pressing him to act, or appear to act, otherwise than in his patients’ interests. Hence the uneasiness at the official-appeals for tightening up milk priority certification. Some of us disagree with the Ministry of Food when it doubts whether the sickness-rate has risen to the extent suggested by the increased number of milk priority certificates issued. But if there is really not enough liquid milk to meet all the priority certificates and to give the general public its 2–2½ pints a week it is doubtless right to revise the list of people receiving certificates. Otherwise there may be more sickness and a greater need for certificates next spring.

The doctor may feel there is no-one whom he can conscientiously take off his list, but if, whenever he is asked for a milk certificate, he says to himself: “Does Mr. Y really need as much milk every day as Mrs. X gets in a week?” perhaps something may be done. Take two actual cases. There is a woman who had a mastectomy four years ago and has had no recurrence of growth; she leads an active life and eats a normal diet; she never calls for professional attention, but she still asks for her milk certificate and still gets it, presumably because she is thin, nervous, and vociferous—especially vociferous. She does not even like the milk, and shares it with her cat, but she insists on having it, although she needs it less than many old people who have to exist on their bare rations. Then there is another

Welsh county boroughs have rates considerably in excess of expectation. It seems legitimate to assume that the difference can only be accounted for by better antenatal care and supervision, coupled with better obstetrics.

One example will indicate the value of antenatal care. In Newcastle-on-Tyne before the war an analysis was given each year by the medical officer of health of the births to mothers who had attended the antenatal clinics. Averaged over the period 1932–38 the stillbirth-rates were as follows:

Among mothers attending antenatal clinics ..	34·9
Among the residual births to Newcastle residents ..	40·6
Among the residual births registered in Newcastle..	64·3
Among births delivered by midwives	26·0

In view of the fact that the antenatal clinics would tend to attract an undue proportion of primiparæ the contrast between the first two figures is notable. The third figure indicates how hospitals tend to attract difficult cases from outside the town. No conclusions should be drawn from the last figure, since it will probably be biased in favour of births to multiparæ. It may be noted, however, that the rate is lower than that for all multiparæ in England and Wales given in table I. Though table I relates to a different period, this comparison under-estimates the actual difference in view of the secular trend.

Finally, it is instructive to ascertain the number of stillbirths which could be prevented if the rate in the country as a whole could be reduced to the level in London, which has the lowest stillbirth-rate, despite an age- and parity-distribution less favourable than the average.

If the rate in England and Wales in 1944 had been equal to that in London there would have been 2100 fewer stillbirths. This may seem a small saving, but it must be remembered that in this year there were better care and better nutrition for the pregnant woman than before the war. Wise administrative action had in all probability levelled many of the social and economic inequalities which existed in pre-war years, and was responsible for the considerable reduction in the average stillbirth-rate. But further saving is possible in view of the statistical experience in Denmark. If the stillbirth-rate in England and Wales in 1944 had been 19·4—the Danish figure—the number of stillbirths expected would have been 14,900. The actual number recorded was 21,200. There would thus have been a saving of 6300 lives Thus the lives of 2000 children would be saved if the incidence in London applied to the whole country, and a further 4000 by attaining the Danish level. Added to this, there would be an appreciable reduction in neonatal deaths, since the problem of neonatal mortality is allied to that of the stillbirth-rate.

SUMMARY

The task of reducing the numbers of stillbirths is important in view of the falling birth-rate. Stillbirths have apparently shown themselves resistant to the improving environmental conditions which have been to a great extent responsible for the decline in infantile mortality between the ages of 3 and 12 months.

The general features of the stillbirth-rate in this country between 1928 and 1944 are surveyed. There was wide geographical variation before the war, and there has been a pronounced and universal decrease throughout the war which has reduced the variation considerably. Attention is called to the low rate in London and the high rate in Wales. The stillbirth-rate is closely related to the neonatal death-rate.

The certified causes of stillbirths are examined. About a third are due to factors which improved obstetrics should help to prevent, and a fifth are attributed to vaguely certified or unknown causes.

Biological variations in the rate are examined, the mo important being the relations with the age and pari of the mother.

It is shown that neither obstetrical nor biologic factors can explain the decrease in the rate during th war, and the influence of antenatal social factors is considered by means of multiple regression. When biologic variations are allowed for it is found that the rate i the county boroughs is not affected by overcrowdin but is influenced by the degree of unemployment an proportion of poorly paid workers. This agrees with th suggestion that the war-time decline is primarily due t the improved nutritional opportunity and the care th has been taken of the pregnant woman. A simil analysis for the English administrative counties shows th rate there to be correlated with the degree of unemplo ment but not with overcrowding or with the proporti of poorly paid workers. In both cases there is eviden that other environmental factors are important. Th value of antenatal care is stressed and demonstrated.

To reduce the stillbirth-rate to the Danish level wou cause the numbers of stillbirths in England and Wal to drop from 21,000 to 15,000, with a correspondin decrease in neonatal deaths.

I wish to thank Miss Marie Lindhardt, of the Dani National Health Service, for information concerning sti births in Denmark; and Dr. W. T. Russell for helpf criticism.

REFERENCES

Baird, D. (1945) *J. Obstet. Gynæc.* **52**, 217, 339.
Census of England and Wales, 1931, occupation tables.
Cheeseman, E. A. (1938) *Human Biol.* **10**, 537.
Lancet (1942) ii, 10.
Registrar-General (1934) Statistical Review of England and Wale
— (1937) *Ibid.*
Sutherland, I. (1946) *Lancet*, i, 756.

CARBOHYDRATE METABOLISM

ON Nov. 25 and 29 Prof. Carl Cori delivered tw lectures at the London School of Hygiene on the fundamental work done in his department at Washingto University, St. Louis, on the intricate mechanism o *carbohydrate metabolism.*

ISOLATION OF CRYSTALLINE ENZYMES FROM MUSCLE

The first lecture dealt chiefly with the study of three ke muscle enzymes—phosphorylase, aldolase, and phosphoglyceraldehyde dehydrogenase. All these enzymes wer prepared in a pure crystalline state in very good yield This work involved a gigantic intellectual as well a physical effort, but Professor Cori made it all sound ver easy. In discussing the preparation of the enzym phosphorylase he described, for example, how all attempt to crystallise this enzyme failed until it was found tha it was essential to filter off a small precipitate which appeared at one stage of the purification of the enzym from the original muscle extract. A further investigation of this precipitate led to its characterisation a an enzyme which split off the coenzyme, adenylic acid from the phosphorylase and thus prevented the successfu isolation of the latter enzyme. The "small precipitate" was termed a P–R enzyme, and its properties, which ar trypsin-like, are being used as a tool in investigating the mode of linkage between coenzyme and apoenzyme.

After describing these "adventures in carbohydrate metabolism," as Professor Cori called them, he outlined his plans for further work in this field, especially research involving the use of isotopes. From such work Professor Cori expects answers to such questions as "What is the average life-time of an enzyme?" and "Where do the enzymes come from?" Already it appears, from detailed amino-acid analyses of these pure crystalline enzymes, that two enzymes which occupy neighbouring positions in the "Cori cycle" differ widely in amino-acid composition. It therefore seems unlikely that all these enzymes originate from some "protein-pool" and acquire their specificity merely by some physical rearrangement of the protein molecule. By simple arithmetic Professor Cori showed for what a vast number of enzymes there is room in a tissue-like muscle, since all the enzymes he has

ROVISION FOR A MAJOR BURNING DISASTER

SIR,—The recent tragedies at Atlanta and in Canada, ith that of 1942 in Boston, involving between them more an 600 lives, must have set many wondering about the ssibility of a similar happening here. A writer in e *Times* has pointed out that in many of our large towns e are by no means adequately protected by stringent e-escape regulations.

On the medical side the disturbing question arises: ow many of our hospitals could cope effectively with a dden influx of, say, 5 to 50 severely burned patients? n the Boston incident the two chief hospitals had to deal ith 170 cases.) Would they be able to mobilise within hour or so the personnel to set up immediate plasma drips" for the bad cases? Would they have the large antity of plasma or serum required, the sterile gowns, asks, and towels, the dressings, the penicillin cream, d—perhaps most important of all—the extra nurses eded for the frequent administration of fluids and other od to those with bandaged hands and faces?

Our experience here is that the care of one severely rned patient may demand as much as 4–5 hours of e time of a skilled medical man and a nurse during the t 24 hours; and we not infrequently use as much as 0 grammes of penicillin cream, and 10 20 crêpe ndages, for a single case. This adequate care during e first 24 hours is all-important both for the saving of e through the critical "shock period" and for the later ocess of repair of the burned tissues. The resources of y hospital are likely to be severely strained to provide ch care.

I would suggest that the necessary arrangements for ch an emergency should be thought out and agreed and periodically revised by hospital staffs. The ganisation of one or more burns centres in our larger ties would certainly be in the best interests of the many ctims of everyday burning accidents as well as the ctims of such occasional major disasters

LEONARD COLEBROOK.

Medical Research Council Burns Unit,
Birmingham Accident Hospital.

TREATMENT OF TUBERCULOSIS

SIR,—Some of the statements made by Dr Houghton d Dr. Corrigan (Dec. 14) ring so true and have such gnificance that they demand repetition. For example

> "The patient who enters a modern sanatorium can no longer contemplate a period of tranquillity and freedom from personal anxiety, but must face a series of collapse therapy measures beginning perhaps with phrenic nerve interruption or artificial pneumothorax or pneumoperitoneum, and advancing, in the case of failure of these measures, towards the irreversible procedure of thoracoplasty. The effect of this protracted ordeal on apprehensive personalities is often disastrous, and some patients are put to too much emotional strain during treatment As we are well aware, this has a deleterious effect on the progress of the disease.
>
> "Apart from surgery, the great benefits of which we do not wish to decry, the very facts of diagnosis and subsequent segregation constitute a severe threat to morale A long stay in hospital, involving perhaps many months of rest in bed, does not tend to reinforce confidence, and sometimes creates more problems than it solves To these emotional stresses may be added domestic and economic problems. *Long rest in bed is useless without a measure of mental serenity.*"

These observations may be viewed in the light of r. George Day's remark (Nov. 16) about his first three ses:

> "In all three the disease was diagnosed early and brought early to treatment without avail."

e know that healthy girls can enter sanatoria as urses, contract the disease, and die of it in the institutions eant to cure, in spite of treatment from the earliest ecognisable sign.

Dr. Day's fourth patient had "bilateral excavation d a family history riddled with phthisis"; yet without y sanatorium or other recognised treatment "the vities, one of which used to be the size of a tangerine range, had disappeared completely. There was plenty of firm-looking scar tissue but no sign of any activity." And he asks the question, "Why did she do better than our sanatorium patients?"

In considering the disadvantages of sanatorium life, do we not tend to gloss over segregation—the separation from healthy minds and bodies? Apart from loneliness, there are many other deleterious factors, particularly those occasioned by shortage of staff and food restrictions.

The number of people whom radiography shows to have recovered from tuberculosis, without any institutional care, is at least ten times the number treated for active disease. Presumably a proportion of those nowadays treated would eventually get well by themselves.

Are we right then to submit patients to the conditions described in the first-quoted paragraph? Would it not be better, particularly in view of the shortage of nurses, beds, and equipment, to do as we have done with other infectious diseases—treat the patients at home? They would at any rate be spared the "disastrous and irreversible procedures." Without the use of amphetamine, and with the lessened mental disturbance, we might see more of the tuberculous deriving the benefits noted in Dr. Day's fourth case.

Birmingham. JAMES F. BRAILSFORD.

FATAL USE OF A DANGEROUS UNIVERSAL DONOR

SIR,—The conclusions reached by Dr. A. D. Morgan and Dr. G. Lumb (Dec. 14) are, in my opinion, based on slender evidence.

In the first place, no real evidence is offered that the onset of anuria was not due to the administration of sulphadiazine; the absence of sulpha crystals in the urine does not eliminate this possibility. In this hospital we recently had a case of sulphadiazine suppression of urine (transfusions of blood had not been given before the onset of oliguria), in which crystals of sulpha compounds were not demonstrated in the small amount of bloody urine passed, although tests for soluble sulphonamides were positive.

The reaction reported by Morgan and Lumb may have been due to the transfusion of blood; but the investigations mentioned were not sufficient to warrant the conclusion that the reaction was due to high-titre α agglutinins in the donor's blood acting on the A antigen of the patient's cells. The following criticisms are made:

(1) There is no mention of any blood-transfusions previously given to the patient. Presumably none were known, but if any were ever given the possibility of isoimmunisation against the Rh antigens must be considered. In this connexion, the diagnosis of the patient as Rh-positive should be considered as unreliable, since the test was made on blood removed from the patient after the transfusions of blood.

(2) Occasionally severe reactions are due to the rare but naturally occurring antibodies against the blood factors M, N, Lutheran, or P. No tests for these antibodies are recorded.

(3) The writers report that *no agglutination* occurred when the patient's cells were tested against his own serum. This test alone may not determine in-vivo sensitisation of the patient's cells unless the absence of an "incomplete" antibody had been demonstrated—e.g., by using Coombe's anti-human globulin serum.

(4) The patient's serum, removed after the onset of suppression, was tested against the cells of the three group-O donors, with negative results. However, in severe transfusion reactions due to the action of the patient's antibodies on donated cells, the specific antibodies are rapidly removed from the circulating plasma and absorbed by the donated cells. Ten days or so later these antibodies reappear. Hence the in-vitro testing of suspected cells against the patient's serum during the first few days following the transfusion-reaction often gives negative results. Positive results may be obtained with a pretransfusion sample of serum or with serum obtained 14 days or more after the transfusion, should the patient survive; but the tests should be performed in tubes at 37° C, as well as at room and refrigerator temperatures. The preliminary

woman who had an operation twenty years ago, she says vaguely, for dropped stomach ; she lives in a hotel where she enjoys a better diet than the average householder, including such luxuries as chicken and duck. Her difficulty is that she cannot digest the badly cooked vegetables and she needs ascorbic acid ; but she has had throughout the war, and still has, a milk certificate. Her doctor is now retiring and the partner will no doubt drop her off the list. These are cases drawn at random from two different districts ; they give a hint that, if the ruling for postoperative cases were strictly followed, there could be some saving of milk for more deserving people.

The Ministry of Food has apparently discovered that the overall consumption of priority milk works out at 12 pints a week per head—nearly 2 pints a day for every holder of a certificate. Yet the only category entitled to receive 2 pints a day is that of gastric and duodenal ulcer. These cases while in hospital actually receive 3 pints a day, but patients with priority certificates for 1 pint receive only 4 oz. of milk a day if on meat diet (at least, they do in our hospital, and Sister says it's "regulations.") So it does not seem that hospitals can be held responsible for the surprising average. Can the milkman, perhaps, throw some light on the mystery ? It is not unknown for him to go on delivering the daily pint, when supplies are good, long after the certificate has expired. He is within his rights, when he has surplus milk, but this is a possible source of confusion to the statistician.

The shortage of milk has been made harder to bear by the *Drink More Milk* campaign of pre-war days, when milk-bars sprang up in the towns, and we all became milk-conscious. There were a few heretics who maintained that man, like other mammals, does not need milk when the period of suckling is over, but in view of the undeniable benefit to children and adolescents who take extra milk such arguments were easily refuted ; and vague biological analogies are never very convincing. So many more people were drinking milk when war began, and the deprivation has consequently been more keenly felt.

Could not this demand be partly met by providing more powdered, evaporated, and tinned milk for the ordinary consumer ? The easily assimilable milk proteins and the mineral salts are especially needed by two non-priority classes—(1) the sick whose certificates have not been renewed, thanks to the tightening up, or who do not come under any of the priority categories, and (2) the aged, whose digestions are failing and who receive no concessions or consideration under the rationing scheme. During the war there was sufficient shipping to carry food to troops in every part of the globe. Could not civilian needs for preserved milk be treated now with the same urgency ?

* * *

There is undoubtedly a whole field of medicine yet to be developed as an adjunct to broadcasting technique—from the "syrup codein. phosph." draught of your coughing correspondent to a couple of 'Seconal' capsules or a shot of intravenous pethidine for the really anxious or distraught. Broadcasting in a discussion recently I felt that we were all greatly in need of some kind of premedication—alcohol being forbidden as too erratic in its effects. For the gabbler of the party (myself) phenobarbitone would have been insufficient ; even a preliminary course of thiouracil to reduce me to myxœdema would have failed to allay my desire to get it over as quickly as possible. Headache—in a stuffy studio—was another complaint, though whether ergotamine tartrate or intensive psychotherapy would have made the better cure must await further research. A mild anorexia was evident only in the female member of the group, but I am convinced that hyperchlorhydria was universal and I am surprised that more ulcers do not perforate during or after broadcasts.

At present the B.B.C. makes no provision for ante-transmission neuroses. Perhaps in future we shall be vetted and doped according to well-established methods and our E.C.G.s and E.E.G.s taken throughout the broadcast. So far the only practical idea has come from a medical colleague who suggests the routine use of bismuth and tinct. opii for a complaint from which our group all suffered.

Letters to the Editor

THE B.M.A.'s DECISION

SIR,—Those who are leading the British Association are men of good intent who really that what they do and think is best both for the and the people. But a time has come when they alienating the sympathy of laymen from us.

It would almost seem that we are being led by a office file that first began to write itself in 1911. Histor has repeated itself. Then as now the council h bargained with a Welshman and had got as much reasonable men could expect. Then as now son wanted more and gained control. Then as now moderat men went, or were driven, out of the council to be replac by the less moderate. And then began that policy of t "strike that is no strike," though no-one but a memb of the B.M.A. council can understand it. It has becon the pigeon-holed policy of the association, brought out fro time to time with enormous preparation, to be put in threatened action and then to fail. It failed in 1911-1 It failed again in 1922–23 or thereabouts. It will fa again now, because the strike is not the weapon of a intellectual profession.

The present policy of the B.M.A. may, for the momen conform to the herded will of the medical profession; does not conform with the profession of the art of med cine. That is progressive, and with the change of tim changes also.

Perhaps the lamentable result of this plebiscite ma be turned to advantage by eliminating the presen Negotiating Committee. This has been absorbed by th B.M.A.—a thing that is likely to happen to committee organised by it. As the largest medical organisation it i asked to collect a number of persons to represent th profession. This it does, and does well ; and then i stultifies its own work by absorbing them to itself an so fixing upon them the policy of its office file. It di so many years ago with the Insurance Acts Committee and though laymen are wrong in supposing that i controls the G.M.C. the fact remains that the directl elected representatives on that body are nowadays th nominees of the B.M.A. council.

The members in the divisions can readily be induced t vote in the way their leaders wish. And so it come *about that a few people of fixed views,* with an abl secretariat, are able to dominate a great profession.

London, S.E.1. T. B. LAYTON.

THE NEGOTIATING COMMITTEE

SIR,—On the average, members of the Negotiating Committee have been qualified for close on 35 years. One of the members has actually been qualified more than half a century. Comment is needless. How differently this committee would be viewed if it contained a majority of younger men—from recent ex-Service personnel down even to fourth-year students. SENEX.

BLOOD-PRESSURE IN PREGNANCY

SIR,—Are many general practitioners spending sleepless nights puzzling over the increasing frequency of hypertension in pregnant women ? True, one is told that it is more apparent than real, and that hypertension is commonly found nowadays only because doctors are more conscientious in taking blood-pressures than of old.

This is scant comfort, and I don't think it is correct. In my own practice I examine some hundred maternity cases yearly, and during the last six months it has been unusual to find a blood-pressure below 136 mm. Hg systolic and 70 mm. diastolic ; the majority vary between 140/90 mm. and 150/100 mm. It isn't my sphygmomanometer, for in despair I have sometimes sent a case to a consulting obstetrician and his readings have been similar. In most cases the blood-pressure starts to rise about the twentieth week and then remains stationary ; but it does rise and I don't know why. The patient, of course, blames the bread : I hesitate to do that.

It would be interesting to know if others have any views on the subject. E. A. NETTELL.

Exmouth.

ROVISION FOR A MAJOR BURNING DISASTER

SIR,—The recent tragedies at Atlanta and in Canada, ith that of 1942 in Boston, involving between them more an 600 lives, must have set many wondering about the ssibility of a *similar happening here.* A *writer in* e *Times* has pointed out that in many of our large towns are by no means adequately protected by stringent e-escape regulations.

On the medical side the disturbing question arises: ow many of our hospitals could cope effectively with a dden influx of, say, 5 to 50 severely burned patients? n the Boston incident the two chief hospitals had to deal ith 170 cases.) Would they be able to mobilise within hour or so the personnel to set up immediate plasma drips" for the bad cases? Would they have the large antity of plasma or serum required, the sterile gowns, asks, and towels, the dressings, the penicillin cream, id—perhaps most important of all—the extra nurses eded for the frequent administration of fluids and other od to those with bandaged hands and faces?

Our experience here is that the care of one severely rned patient may demand as much as 4–5 hours of e-time of a skilled medical man and a nurse during the t 24 hours; and we not infrequently use as much as 0 grammes of penicillin cream, and 10–20 crêpe ndages, for a single case. This adequate care during e first 24 hours is all-important both for the saving of fe through the critical "shock period" and for the later rocess of repair of the burned tissues. The resources of ny hospital are likely to be severely strained to provide ch care.

I would suggest that the necessary arrangements for ch an emergency should be thought out and agreed n and periodically revised by hospital staffs. The rganisation of one or more burns centres in our larger ities would *certainly* be in the best interests of the many ictims of everyday burning accidents as well as the ictims of such occasional major disasters.

LEONARD COLEBROOK.

Medical Research Council Burns Unit,
Birmingham Accident Hospital.

TREATMENT OF TUBERCULOSIS

SIR,—Some of the statements made by Dr. Houghton nd Dr. Corrigan (Dec. 14) ring so true and have such ignificance that they demand repetition. For example:

> "The patient who enters a modern sanatorium can no longer contemplate a period of tranquillity and freedom from personal anxiety, but must face a series of collapse-therapy measures beginning perhaps with phrenic-nerve interruption or artificial pneumothorax or pneumoperitoneum, and advancing, in the case of failure of these measures, towards the irreversible procedure of thoracoplasty. The effect of this protracted ordeal on apprehensive personalities is often disastrous, and some patients are put to too much emotional strain during treatment. As we are well aware, this has a deleterious effect on the progress of the disease.
>
> "Apart from surgery, the great benefits of which we do not wish to decry, the very facts of diagnosis and subsequent segregation constitute a severe threat to morale. A long stay in hospital, involving perhaps many months of rest in bed, does not tend to reinforce confidence, and sometimes creates more problems than it solves. To these emotional stresses may be added domestic and economic problems. *Long rest in bed is useless without a measure of mental serenity.*"

These observations may be viewed in the light of Dr. George Day's remark (Nov. 16) about his first three cases:

> "In all three the disease was diagnosed early and brought early to treatment without avail."

We know that healthy girls can enter sanatoria as nurses, contract the disease, and die of it in the institutions meant to cure, in spite of treatment from the earliest recognisable sign.

Dr. Day's fourth patient had "bilateral excavation and a family history riddled with phthisis"; yet without any sanatorium or other recognised treatment "the cavities, one of which used to be the size of a tangerine orange, had disappeared completely. There was plenty of firm-looking scar tissue but no sign of any activity." And he asks the question, "Why did she do better than our sanatorium patients?"

In considering the disadvantages of sanatorium life, do we not tend to gloss over segregation—the separation from healthy minds and bodies? Apart from loneliness, there are many other deleterious factors, particularly those occasioned by shortage of staff and food restrictions.

The number of people whom radiography shows to have recovered from tuberculosis, without any institutional care, is at least ten times the number treated for active disease. Presumably a proportion of those nowadays treated would eventually get well by themselves.

Are we right then to submit patients to the conditions described in the first-quoted paragraph? Would it not be better, particularly in view of the shortage of nurses, beds, and equipment, to do as we have done with other infectious diseases—treat the patients at home? They would at any rate be spared the "disastrous and irreversible procedures." Without the use of amphetamine, and with the lessened mental disturbance, we might see more of the tuberculous deriving the benefits noted in Dr. Day's fourth case.

Birmingham. JAMES F. BRAILSFORD.

FATAL USE OF A DANGEROUS UNIVERSAL DONOR

SIR,—The conclusions reached by Dr. A. D. Morgan and Dr. G. Lumb (Dec. 14) are, in my opinion, based on slender evidence.

In the first place, no real evidence is offered that the onset of anuria was not due to the administration of sulphadiazine; the absence of sulpha crystals in the urine does not eliminate this possibility. In this hospital we recently had a case of sulphadiazine suppression of urine (transfusions of blood had not been given before the onset of oliguria), in which crystals of sulpha compounds were not demonstrated in the small amount of bloody urine passed, although tests for soluble sulphonamides were positive.

The reaction reported by Morgan and Lumb may have been due to the transfusion of blood; but the investigations mentioned were not sufficient to warrant the conclusion that the reaction was due to high-titre α agglutinins in the donor's blood acting on the A antigen of the patient's cells. The following criticisms are made:

(1) There is no mention of any blood-transfusions previously given to the patient. Presumably none were known, but if any were ever given the possibility of isoimmunisation against the Rh antigens must be considered. In this connexion, the diagnosis of the patient as Rh-positive should be considered as unreliable, since the test was made on blood removed from the patient after the transfusions of blood.

(2) Occasionally severe reactions are due to the rare but naturally occurring antibodies against the blood factors M, N, Lutheran, or P. No tests for these antibodies are recorded.

(3) The writers report that no agglutination occurred when the patient's cells were tested against his own serum. This test alone may not determine in-vivo sensitisation of the patient's cells unless the absence of an "incomplete" antibody had been demonstrated—e.g., by using Coombe's anti-human globulin serum.

(4) The patient's serum, removed after the onset of suppression, was tested against the cells of the three group-O donors, with negative results. However, in severe transfusion reactions due to the action of the patient's antibodies on donated cells, the specific antibodies are rapidly removed from the circulating plasma and absorbed by the donated cells. Ten days or so later these antibodies reappear. Hence the in-vitro testing of suspected cells against the patient's serum during the first few days following the transfusion-reaction often gives negative results. Positive results may be obtained with a pretransfusion sample of serum or with serum obtained 14 days or more after the transfusion, should the patient survive; but the tests should be performed in tubes at 37° C, as well as at room and refrigerator temperatures. The preliminary

woman who had an operation twenty years ago, she says vaguely, for dropped stomach; she lives in a hotel where she enjoys a better diet than the average householder, including such luxuries as chicken and duck. Her difficulty is that she cannot digest the badly cooked vegetables and she needs ascorbic acid; but she has had throughout the war, and still has, a milk certificate. Her doctor is now retiring and the partner will no doubt drop her off the list. These are cases drawn at random from two different districts; they give a hint that, if the ruling for postoperative cases were strictly followed, there could be some saving of milk for more deserving people.

The Ministry of Food has apparently discovered that the overall consumption of priority milk works out at 12 pints a week per head—nearly 2 pints a day for every holder of a certificate. Yet the only category entitled to receive 2 pints a day is that of gastric and duodenal ulcer. These cases while in hospital actually receive 3 pints a day, but patients with priority certificates for 1 pint receive only 4 oz. of milk a day if on meat diet (at least, they do in our hospital, and Sister says it's "regulations.") So it does not seem that hospitals can be held responsible for the surprising average. Can the milkman, perhaps, throw some light on the mystery? It is not unknown for him to go on delivering the daily pint, when supplies are good, long after the certificate has expired. He is within his rights, when he has surplus milk, but this is a possible source of confusion to the statistician.

The shortage of milk has been made harder to bear by the *Drink More Milk* campaign of pre-war days, when milk-bars sprang up in the towns, and we all became milk-conscious. There were a few heretics who maintained that man, like other mammals, does not need milk when the period of suckling is over, but in view of the undeniable benefit to children and adolescents who take extra milk such arguments were easily refuted; and vague biological analogies are never very convincing. So many more people were drinking milk when war began, and the deprivation has consequently been more keenly felt.

Could not this demand be partly met by providing more powdered, evaporated, and tinned milk for the ordinary consumer? The easily assimilable milk proteins and the mineral salts are especially needed by two non-priority classes—(1) the sick whose certificates have not been renewed, thanks to the tightening up, or who do not come under any of the priority categories, and (2) the aged, whose digestions are failing and who receive no concessions or consideration under the rationing scheme. During the war there was sufficient shipping to carry food to troops in every part of the globe. Could not civilian needs for preserved milk be treated now with the same urgency?

* * *

There is undoubtedly a whole field of medicine yet to be developed as an adjunct to broadcasting technique—from the "syrup codein. phosph." draught of your coughing correspondent to a couple of 'Seconal' capsules or a shot of intravenous pethidine for the really anxious or distraught. Broadcasting in a discussion recently I felt that we were all greatly in need of some kind of premedication—alcohol being forbidden as too erratic in its effects. For the gabbler of the party (myself) phenobarbitone would have been insufficient; even a preliminary course of thiouracil to reduce me to myxœdema would have failed to allay my desire to get it over as quickly as possible. Headache—in a stuffy studio—was another complaint, though whether ergotamine tartrate or intensive psychotherapy would have made the better cure must await further research. A mild anorexia was evident only in the female member of the group, but I am convinced that hyperchlorhydria was universal and I am surprised that more ulcers do not perforate during or after broadcasts.

At present the B.B.C. makes no provision for ante-transmission-neuroses. Perhaps in future we shall be vetted and doped according to well-established methods and our E.C.G.s and E.E.G.s taken throughout the broadcast. So far the only practical idea has come from a medical colleague who suggests the routine use of bismuth and tinct. opii for a complaint from which our group all suffered.

Letters to the Editor

THE B.M.A.'s DECISION

SIR,—Those who are leading the British Medi Association are men of good intent who really beli that what they do and think is best both for the profes and the people. But a time has come when they alienating the sympathy of laymen from us.

It would almost seem that we are being led by office file that first began to write itself in 1911. Hist has repeated itself. Then as now the council bargained with a Welshman and had got as much reasonable men could expect. Then as now so wanted more and gained control. Then as now moder men went, or were driven, out of the council to be repla by the less moderate. And then began that policy of "strike that is *no* strike," *though no-one* but a mem of the B.M.A. council can understand it. It has beco the pigeon-holed policy of the association, brought out fr time to time with enormous preparation, to be put i threatened action and then to fail. It failed in 1911- It failed again in 1922–23 or thereabouts. It will again now, because the strike is not the weapon of intellectual profession.

The present policy of the B.M.A. may, for the mome conform to the herded will of the medical profession; does not conform with the profession of the art of me cine. That is progressive, and with the change of ti changes also.

Perhaps the *lamentable* result of this plebiscite m be turned to advantage by eliminating the prese Negotiating Committee. This has been absorbed by t B.M.A.—a thing that is likely to happen to committe organised by it. As the largest medical organisation it asked to collect a number of persons to represent t profession. This it does, and does well; and then stultifies its own work by absorbing them to itself a so fixing upon them the policy of its office file. It d so many years ago with the Insurance Acts Committe and though laymen are wrong in supposing that controls the G.M.C. the fact remains that the direct elected representatives on that body are nowadays t nominees of the B.M.A. council.

The members in the divisions can readily be induced vote in the way their leaders wish. And so it com about that a few people of fixed views, with an ab secretariat, are able to dominate a great profession.

London, S.E.1.

T. B. LAYTON.

THE NEGOTIATING COMMITTEE

SIR,—On the average, members of the Negotiati Committee have been qualified for close on 35 year One of the members has actually been qualified more tha half a century. Comment is needless. How different this committee would be viewed if it contained a majorit of younger men—from recent ex-Service personnel dow even to fourth-year students.

SENEX.

BLOOD-PRESSURE IN PREGNANCY

SIR,—Are many general practitioners spending slee less nights puzzling over the increasing frequency hypertension in pregnant women? True, one is to that it is more apparent than real, and that hype tension is commonly found nowadays only because docto are more conscientious in taking blood-pressures tha of old.

This is scant comfort, and I don't think it is correc In my own practice I examine some hundred maternit cases yearly, and during the last six months it has bee unusual to find a blood-pressure below 136 mm. H systolic and 70 mm. diastolic; the majority vary betwee 140/90 mm. and 150/100 mm. It isn't my sphygmo manometer, for in despair I have sometimes sent a cas to a consulting obstetrician and his readings have bee similar. In most cases the blood-pressure starts to ris about the twentieth week and *then remains stationary* but it does rise and I don't know why. The patient of course, blames the bread: I hesitate to do that.

It would be interesting to know if others have any view on the subject.

Exmouth.

E. A. NETTELL.

oses of 10 mg. or intramuscular doses of 50 mg. of iamine might be sufficient to precipitate masked defi- encies of other factors, and this may be the explanation f the suddenly increased weakness and ataxia in both ses.

At a time when the chemical industry produces creasingly potent synthetic vitamins at decreasing rices, and when both public and profession are becoming ore and more vitamin-conscious, it would seem that the terdependence of the several factors—at present mainly emonstrated in the B group of vitamins—deserves reater consideration.

London, W.1. Z. A. LEITNER.

CORONARY DISEASE

SIR,—In support of the possible infective basis of oronary artery occlusion, Dr. G. E. Beaumont (Dec. 14) ites the development of leucocytosis and a raised erythro-yte-sedimentation rate (E.S.R.) in this condition. Surely t is generally accepted that these are manifestations of he myocardial infarction and the resulting destruction f tissue. I would suggest that any simple aseptic farct in any site may, if large enough, lead to the evelopment of fever, leucocytosis, and a raised E.S.R., nd that therefore such phenomena following an occlusion do not in any way indicate an infective process.

Department of Pathology,
University of Bristol. M. SYMONS.

A MORAL PROBLEM

SIR,—The issue is not so much whether the results of he German investigators should be published as whether cience can ever truly profit from crime.

There can be no scientific honesty without moral ourage, and no clear reasoning without freedom of hought. In the atmosphere of crime, lies, and suppression that pervaded Nazi Germany no true scientist could have produced anything worth while. And how could one trust the scientific findings of people so devoid of judgment and reasoning that they believed their government's propaganda that Poles, Russians, Frenchmen, and Jews were criminals who should die an abominable death because of their race?

No doubt some points in their findings might be of use to investigators. But there is a far more valuable lesson to be learnt from publication—namely, that with all their unheard-of facilities these Nazi criminals could make few observations of importance.

Mitcham. MAX B. KLEIN.

SIR,—Perhaps it is fortunate for Mr Mellanby that the slaughter of prisoners is not yet British custom. He has thus been spared decision in that moral dilemma which he finds so perplexing.

If the Germans obtained important information from their investigations he would think it right to use their findings. In fact, however, we have no reason to believe that anything of value was ever discovered by the Germans by these methods. The privileges of study in the prison camps were granted, in the main, as rewards for faithful service, to Party officials and S.S. men, and to leaders of the Hitlerjugend and Hitlermädel. By 1939 repeated purges of the medical profession had ensured that its surviving members should be honoured confederates in such company.

The experiments consisted largely in elaborate sexual assault. The atmosphere of pseudo-science in which the proceedings were staged, to the accompaniment very often of the music of Wagner and Beethoven, was no more than a ritualistic addition designed to lend piquancy to the occasion.

These things are not widely understood. Mr. Mellanby cannot be expected to assess with justice circumstances of which, by implication from his letter, he has no conception. Nevertheless, in appearing to discern dignity in monstrous evil, he does some small further injury to the outside world's already sufficiently feeble appreciation of what it is that has been destroyed in Germany.

Dartford, Kent. I. McD. G. STEWART.

Public Health

Rag Flock, Bedding, and Upholstery

THE bedding and upholstered articles on which people spend about a third of their lives should be clean. The Interdepartmental Committee on the Rag Flock Acts point out[1] that this country lags behind some others in the legislation and precautions adopted to ensure that the filling materials are free from infection and dirt. They received evidence that rag flock, the commonest filling material used, is still being made from dirty rags. One witness said that some of this material is collected by rag-and-bone men who go round from house to house with a barrow or cart and collect from tips and dumps. These men are usually employed, or paid for what they bring in, by dealers. No material, however dirty, is refused. "It calls for little imagination," said the witness, "to realise that most of these rags must of necessity contain much infection, filth, and excreta." In the factories where the rag flock is made the cleansing processes vary within fairly wide limits according to the facilities available and to the zeal and scrupulousness of the manufacturers. The provisions of the Factories Act as regards health and cleanliness apply of course to registered factories. In some places the rags are steeped in cold water, and sometimes hot water with or without detergents is used. In others the rags are subjected to agitation while being steeped, the temperature of the water being raised by steam under pressure. A number of rag-flock factories, however, have no washing plant and presumably the rags are not washed at all. To make rag flock the dried rags are disintegrated by passing them over a rapidly revolving cylinder studded with steel teeth. This is a dusty process, the dust being controlled more or less effectively by exhaust ventilation. Sometimes the rags are sprayed with small quantities of oil to reduce the loss of fibre in the dust, but the use of oil has the disadvantage of binding some of the dirt into the flock.

The present legislation dealing with the manufacture and use of rag flock is contained in the Rag Flock Act, 1911, and the regulations made under it in 1912; the Rag Flock Amendment Act, 1928, and the Public Health (London) Act, 1936, sec. 136. The latter section re-enacts the provisions of the previous Acts and regulations in substantially the same form. The Act of 1911 makes it an offence for any person to sell or have in his possession for sale flock made from rags or to use it for the purpose of making upholstery, cushions, or bedding or to have it in his possession unless it conforms to a prescribed standard of cleanliness. This standard was prescribed under the regulations of 1912 and consists of what is known as the "chlorine test," by which the amount of chlorides removed by washing under specified conditions does not exceed 30 parts of chlorine in 100,000 parts of flock. The duty of administering the Act and regulations is placed on the local authorities. The 1928 Act defined the term "flock manufactured from rags" and limited its application to material produced from woven, knitted, or felted materials.

RECOMMENDATIONS

The committee could find no direct evidence that disease or ill health is being transmitted by unclean filling materials used in bedding and upholstery, but they think it safe to presume that disease might arise from the use of such materials. It is possible that the use of unclean filling materials is a contributory cause of certain respiratory ailments in which the sources of infection are not known. In any case the development of the public-health services is based on the attainment of cleanliness. The committee regard the present legislation dealing with the making and use of rag flock as inadequate to protect the public. In their opinion there should be a statutory prohibition against the sale of unclean rag flock intended for use as a filling material. All premises on which rag flock is made or stored or is used in making bedding, upholstery, or other household routine cross-matching of patient's serum and donor's cells performed on a tile may sometimes not show this incompatibility.

---

[1] Cmd 6866. London: H.M. Stationery Office. Pp. 36. 9d. The committee was appointed in 1936 with Lord Merthyr as chairman, and its medical members were Dr. W. G. Clark and the late Dr. G. H. Pearce.

(5) A transfusion reaction due to high-titre α agglutinin in group-O blood given to a group-A patient would be unlikely or impossible if the patient's serum normally contained soluble A factor. This is usually the case when the saliva contains the A substance, but no mention is made whether the patient was a "secretor" of A substance; nor was the presence of this substance in the patient's serum apparently investigated. This possibility must be eliminated before concluding that the anuria was due to the high-titre α agglutinin in the donor's plasma.

S. SEVITT.

Pathological Department, Military Hospital for Head Injuries, Wheatley, Oxon.

DANGERS OF CALCIFEROL

SIR,—Your leading article of Dec. 14 is timely. We were on the point of writing to suggest that some restriction should be placed on the sale of calciferol. A sense of harmlessness surrounds the idea of vitamin therapy, but, in fact, the highly concentrated preparations may be most dangerous.

We have had some two hundred patients, mostly suffering from lupus vulgaris, under treatment with calciferol over the past twelve months and intend in due course to publish our observations and the results of our investigations. We feel, however, that the incidence of toxic symptoms is so high, and the character of the symptoms so serious, that some warning is necessary in view of the freedom with which calciferol is being presented to the profession and the public.

Symptoms of intolerance arise as often and seriously in adults as in children. A high proportion of these cases present the picture of an abdominal emergency, and the symptoms may deceive the élite. Urgent admission to hospital and operation may follow.

In all our cases of intoxication there has been a considerable increase in serum calcium and a raised blood-urea. Though the total calcium may not be raised in those with mild symptoms, the diffusible calcium is invariably raised. Macrae has recently stressed the importance of watching the blood-sedimentation rate. In animals we have found that calciferol severely damages the kidneys.

It seems desirable that all patients on calciferol should have written instructions to stop treatment and report immediately should they experience any untoward symptoms, and especially such abdominal symptoms as pain, anorexia, sickness, and extreme constipation. With such precautions, and careful and regular observation and biochemical control, serious harm is not likely to occur.

That calciferol is of importance in the treatment of lupus vulgaris and that it will play an important part in the control of the problem of lupus is quite certain. That it is of value in other ills is unproven, and it should not be prescribed in high dosage except with proper control.

JOHN T. INGRAM J. DAWSON
Leeds. S. T. ANNING D. E. DOLBY.

PERFORATED PEPTIC ULCER TREATED WITHOUT OPERATION

SIR,—Mr. Hermon Taylor (Sept. 28) states that the conservative treatment of perforated peptic ulcers has a mortality of 14%, and that surgical intervention should be reserved for late cases—patients with gastric dilatation from pyloric stenosis—and for those who have ingested a large quantity of fluid just before or after the perforation.

Signs suggesting perforation are usually pronounced, but sometimes, as laparotomy shows, these signs appear without a perforation. At other times the so-called *gedeckte* (subacute or sealed) perforation, which was first described by the Viennese surgeon, Schnitzler, is found; here the ulcer is sealed off by adhesions to a neighbouring viscus, either before or immediately after the perforation. The symptoms are less acute, and the peritoneal signs are more or less limited; in many gas may be found under the diaphragm. In such cases, if there is no deterioration in the first few hour
defer operation until all signs of peritoneal
have disappeared.

In other cases the perforation is not sealed
adhesions; the opening remains free and uncovere
seen at laparotomy on late cases.

As we know, the contents of the stomach are
by virtue of its hydrochloric acid, so that perit
does not develop if the ulcer is closed by adhesio
suture. But if the opening remains, the highly inf
contents of the intestines can discharge into the
toneal cavity by antiperistaltic waves.

A surgeon expecting every perforated ulcer to be s
off by adhesions will be disappointed, especially if h
not the wide experience of Mr. Hermon Taylor;
failure means the death of the patient.

The late results of simple suture of a perforated
are not satisfactory; in 91% of these cases a ne
recurrent ulcer is found later, so that the patie
exposed to the risk of a second operation or a
perforation.

Therefore with perforations seen after 12–24 hou
perform a partial gastrectomy; the mortality is
in the first twelve hours and 12% in the second, b
many of these late cases peritonitis has already develo
After 24 hours a suture operation only is perfor
In all of Mr. Taylor's cases a partial gastrectomy w
have been undertaken.

Surgical Clinic, University of Graz. A. WINKELBAUI

MALNUTRITION IN RELEASED PRISONERS-OF-WAR AT SINGAPORE

SIR,—The admirable analysis of malnutrition
Dr. Mitchell and Dr. Black (Dec. 14, p. 855) and si
recent studies make a further advance in the evalu
of the causal relationships of single and multiple defici
states.

Signs of vitamin deficiency have often been r
several weeks after the patient has been on a full n
tious hospital diet with vitamin therapy. Cases 1 a
(Mitchell and Black) illustrate this point. Both pat
had peripheral neuritis with tingling, numbness, red
sensibility, and loss of superficial reflexes, with
degree of amblyopia. Both patients were given 6
pound vitamin tablets daily (containing altoge
150 mg. ascorbic acid, 60 mg. nicotinic acid, 6
thiamine, and 6 mg. riboflavin), while case 1 was g
in addition 10 mg. of thiamine daily intravenously
case 4 received 50 mg. of thiamine daily intramuscul
After nine days' treatment case 1 became sudd
weaker in the legs with gross ataxia of both arms
legs, while case 4 was suddenly unable to walk or w
The authors mention that similar observations
described by Spillane and Scott [1] and also by Clarke
Sneddon.[2]

During recent years the importance of the interrela
ship between various factors of the vitamin-B group
been urged several times, subclinical latent deficie
becoming manifest after energetic treatment of
obvious deficiency. Pellagrins have been reporte
showing signs of beriberi, or what has been describe
riboflavin deficiency, after treatment with nico
acid [3, 4]; signs of pellagra [5] and of riboflavin deficien
have appeared after treatment with thiamine. Richar
demonstrated experimentally on rats that excess of t
mine may easily precipitate a masked deficiency
pyridoxine. Mitchell and Black's case 1 had 10 mg
thiamine intravenously; case 4 had 50 mg. intramu
larly. As far as could be ascertained, the cases repo
by Spillane[8] and by Clarke and Sneddon [2] were
given generous doses of thiamine, although these writ
especially Spillane, tried to balance the diet of t
patients carefully. It is reasonable to submit tha
grossly undernourished chronic cases daily intraven

---

1. Spillane, J. D., Scott, G. I. *Lancet*, 1945, ii, 261.
2. Clarke, C. A., Sneddon, J. B. *Proc. R. Soc. Med* 1946, 39,
3. Spies, T. D., Vilter, R. W., Ashe, W. F. *J. Amer. med*
   1939, 113, 931.
4. Sydenstricker, V. P., Sebrell, W. H., Cleckley, H. M., Kr
   H. D. *Ibid*, 1940, 114, 2437.
5. Lehman, J., Nielsen, H. E. *Nord Med.* 1939, 1, 289.
6. Leitner, Z. A. *Brit. med. J.* 1945, i, 609.
7. Richards, M. B. *Ibid*, p 433.
8. Spillane, J. D. *Proc. R. Soc. Med.* 1946, 39, 175.

eement with the Joint Advisory Dental Council.—Mr. es Griffiths replied: As part of the agreement the Joint visory Dental Council advised members of the profession erally to resume the practice of accepting insured persons treatment in accordance with the Dental Benefit Regulans. It has always been a matter for each individual dentist decide whether or not he will accept patients on this basis, d a certain number of dentists have never participated in e service. I am aware that certain dentists have indicated at they are not following the recent advice of the advisory uncil but I have no reason to believe that this is the attitude f any large proportion of dentists.

Future of King's Fund

Sir John Graham Kerr asked the Minister of Health what, der the new National Health Service Act, were the intentions f the Government with regard to the King Edward's Hospital und.—Mr. A. Bevan replied: The new Act does not alter any f the powers and duties of the Fund under its own statute. I pe that the Fund will continue its very valuable work—in hatever forms it may feel to be appropriate to the new rvice.

Obituary

WILLIAM JOB COLLINS

K.C.V.O., M.D., M.S. LOND., F.R.C.S.

Sir William Collins, whose death was announced in ur last issue, died on Dec. 12 at the house in Albert errace, Regent's Park, where he was born 87 years ago nd where his father, Dr. W. J. Collins, practised. His other, Mary Anne Francisca Treacher, belonged to the Huguenot family of Garnault. The family took pride in their distaff descent, and some twenty years ago Sir William served as president of the Huguenot Society in London. From University College School he went with a Jeaffreson exhibition to St. Bartholomew's Hospital, where he graduated M.B. in 1881, winning the university scholarship and a gold medal in obstetrics. After holding house-appointments at Barts he became in 1884 demonstrator in anatomy. Before he qualified in medicine he had already taken his B.SC. with honours in physiology, and he was unable to accept the current tenets of medicine unquestioningly. s early as 1881 he was asking in our columns how far e commonly accepted notions of the specificity of isease should be modified by the doctrine of evolution:

Press Portrait Bureau

> "The common ancestry of specific diseases, once recognised, would do much to remove the hard and fast line so often drawn between diseases and diseases in textbooks, and dissertations, but of which nature knows nothing."

his theory he later elaborated in his essay on *Specificity d Evolution*, which Herbert Spencer, to whom it was edicated, declared opened the way to a "considerable form in pathology," and in *The Man v. Microbe* (1903). erhaps it was his background of heterodoxy which flected him from what promised to be a brilliant rgical career: for after taking his M.S., M.D., and R.C.S., all in 1884 and 1885, he turned to the specialty ophthalmology. He joined the staff of the Royal ye Hospital and Western Ophthalmic Hospital as rgeon, and was also ophthalmic surgeon to the National emperance Hospital. He published a monograph on taract in 1897, and during the war of 1914–18 he scribed several interesting cases of gunshot wounds the eye. As Doyne medallist and lecturer in 1918 he oke on Ophthalmology and the War. A senator of s university for over 30 years, he twice held office its vice-chancellor.

From his conception of the specificity of disease sprang s belief that diseases should be fought outside the body d not within it. With this belief went his eagerness to improve the environment of the people, and he was among the last of the great Liberal Victorian social reformers. One of his heroes was Edwin Chadwick, whose biographer he later became, while Florence Nightingale and Sir William Morris, founder of the Charity Organisation Society, were his friends.

For many years a member of the London County Council, he was its chairman in 1897. In 1904 he was chairman of its first education committee, while its ambulance service was started almost entirely through his efforts. In 1909 a departmental committee and the L.C.C. itself recommended that the Metropolitan Asylums Board should provide the service. Sir William, a member both of the committee and the council, opposed this suggestion, and when neither would accept his views, nothing daunted, he introduced into Parliament, to which he had been elected in 1906, a Bill to confer the powers on the L.C.C. The Commons accepted it in preference to a Bill based on the recommendations of the departmental committee, and the L.C.C. reluctantly accepted its new obligations. The service was started in 1915 under the control of the chief officer of the fire brigade. Sir William became a vice-lieutenant of the county of London in 1925 and was also a justice of the peace.

An experienced and able negotiator, he sat on many royal commissions, notably those on vivisection (1906–12) and on vaccination (1889–96). An ideal chairman, he presided over a select committee on the hop industry (1908), the departmental committee on accidents to railway servants (1914–19), the Conciliation and Arbitration Board for Civil Servants (1917–18), and the Sussex Agricultural Wages Committee (1920–39). To bodies more nearly allied to medicine he was an equally valued counsellor, and he was chairman of the Chadwick Trust, member of the council of the King's Fund, president of the Sanitary Inspectors Association, and from 1899 to 1928 secretary of the League of Mercy. He was asked to help in the formation of the Central Council for District Nursing, and his skilful handling of the eager but sometimes conflicting interests involved brought order and system to the work of the council, of which he was chairman for more than thirty years. When he retired in 1944 the position of president was specially created for him. His work for the council is an example of his value as a coördinator. Through his contacts with the L.C.C. and with the King's Fund, the work of district nursing came to be linked both with the municipal and voluntary hospitals, while as trustee of the City Parochial Charities he was able by his excellent advocacy to direct funds to its exchequer.

As plenipotentiary for Great Britain he attended three international opium conferences held at The Hague between 1911 and 1914. His interest in the problems of addiction linked him to the Medico-Legal Society, over which he presided from 1901 to 1905, and his *Ethics and Law of Drug and Alcohol Addiction* which appeared in 1916 was a balanced survey. He believed in the "potency for good of reduced facilities for tippling," but he advocated restriction and not prohibition.

"I knew Sir William Collins well," Lord Addison writes, "and he was one of those in the old days who stimulated interest in many of us in public affairs as well as in surgery. Looking back on the time of my own acquaintance with him I should say that this fact was outstanding. In those days his wide public interests and sustained activities placed him almost in a class by himself, I should think, amongst surgeons." He was knighted in 1902 and appointed K.C.V.O. in 1914. His acute brain and statesmanlike grasp of affairs served many good causes without a trace of self-interest, and he served them all well.

JOHN ERNEST ALBERT LYNHAM

M.D. BELF., M.R.C.P., F.F.R.

Dr. J. E. A. Lynham, consulting radiologist to Mount Vernon Hospital, died on Dec. 14. He was educated at Queen's College, Galway, where his father, Dr. J. I. Lynham, was for many years professor of medicine, and at Queen's College, Belfast, where he graduated in medicine in 1907, taking his M.D. four years later. After two years as assistant medical officer at the Woolwich Infirmary he was in 1911 appointed assistant superinfurniture should be registered by the local authorities, who should be given power to suspend or revoke registration if the necessary conditions are not being satisfied. There should be the right of appeal against any decision of a local authority to the Minister of Health or the Secretary of State for Scotland. Rag-flock manufacturers and wholesale dealers should be required to keep records showing the destination of each consignment of flock sold by them and the date of sale. Bedding and upholstery makers using rag flock should also keep records of the sources of supply. Local-authority officers should be empowered to inspect the records and to enter any registered or unregistered premises to take samples for analysis. They should also have power to enter any premises on which finished articles of bedding or furniture are sold or offered or exposed for sale; the cost of repairing any damage caused by the opening up of the finished articles should be met by the local authority unless a conviction ensues. Any retailer of bedding and upholstery should be able to plead as a defence a warranty given by the maker in legal proceedings taken against him.

Most of the recommendations about rag flock should, in the opinion of the committee, be applied to all other filling materials such as kapok, feathers, down, wool, and various vegetable fibres. Whatever the filling material used there should be compulsory labelling of each article of bedding and upholstery so that its origin might be traced. Legislation controlling the use of filling materials should also be applied to the coverings and linings of upholstered articles. Evidence had been given to the effect that dirty sacking, tainted meat wrappers, and other contaminated articles are sometimes used as linings of bedding and upholstery. It is added that the filling materials of stuffed toys should have the same standard of cleanliness as that laid down for upholstered articles and bedding. The committee do not think it practicable to prescribe in detail the washing and sterilising processes to be applied in the manufacture of rag flock. In their opinion the proposed system of registration and inspection by the local authority will bring about the necessary standards of cleanliness. The "chlorine test" is regarded as unsatisfactory because it cannot be assumed that flock containing a high proportion of soluble chlorides is necessarily dirty, and further, the standard of 30 parts of chlorine to 100,000 parts of flock is too easily reached without adequate cleansing. The Fenton test at present under investigation by the British Standards Institution, in conjunction with the trade, is the best available test for rag flock and animal fibres. It is necessary, however, to devise other tests for cotton flocks and some other vegetable fibres.

The committee urge that new legislation on this subject should not be too long delayed because it is a matter which touches closely on the daily lives of the whole population.

Infantile Diarrhœa in Maternity Homes

The Registrar-General's figures for the first eleven weeks of the December quarter do not show any notable increase of mortality from enteritis and diarrhœa. Thus in 126 great towns (including London) the average number of deaths of children under 2 years of age per 1000 births for the December quarter 1946 to date was 5·8, whereas the comparative figure for the same period of 1945 was 6·8.

The outbreaks of gastro-intestinal illness recently reported from maternity homes and other institutions in various parts of the country are not all of the same clinical type. Up to date the most serious appears to have been at two hospitals in Leicestershire with between 40 and 50 cases among infants and 23 deaths. In its high case-mortality and relative lack of associated illness in adults this outbreak resembles incidents already recorded in the United States[1] in 1939 and in England[2] in 1943. This condition usually begins during the first three weeks of life with a sudden loss of weight which may precede obvious gastro-intestinal upset by several days. Pyrexia is not always present but the subsequent course suggests an intense toxæmia or shock. In any particular institution the beginning of such an outbreak may not be explosive, there being intervals of a week or so the first cases. Breast-feeding does not always but the breast-fed infant appears to stand a much chance of survival. Pathological and bac investigations have hitherto proved entirely The only effective measure of control is closure of ward or nursery concerned.

In the outbreak reported in connexion with a matern home at Preston the illness of the 18 fatal cases began varying intervals after discharge from the home, and trouble started as long ago as August. It is not possible to state the case-mortality of this outbre which presents some unusual clinical features that being investigated by a team of pædiatricians.

The illness among infants reported from instituti in several other areas differs clinically from that Leicester or Preston and appears to be much less sev Usually mothers and nursing staff have been affected well as infants. In one outbreak at Hull it is possi though not yet confirmed, that the cause was a salmone

---

1. Frant, S., Abramson, H. *N. Y. St. J. Med.* 1939, 39, 784.
2. Sakula. J. *Lancet*, 1943, ii, 758.

Parliament

QUESTION TIME

Care of Children

Mrs. M. E. NICHOL asked the Prime Minister what st were being taken to implement the interim report of the C of Children Committee on training in child care, which presented last March.—Mr. H MORRISON, Lord Presiden the Council, replied: As soon as the interim report was recei interdepartmental consultations took place and a plan worked out to meet the recommendation of the Curtis Co mittee for a central training council to promote basic train in child care for house mothers. This plan has requi reconsideration in the light of the recommendation in the fi report that the functions of the training council should extended to cover more advanced training for other cla of persons who are concerned with the care of home children. There will be no delay in preparing and giving eff to this revised plan, but while a long-term plan for the train of staff will no doubt be advantageous, it will not meet immediate difficulty caused by the acute shortage of staff children's homes. When an attempt was made last sum to start, in accordance with the suggestion in the int report, a course of training for senior staff it was found that homes were unable to spare any members of their staff for purpose.

Less Bacon and More Milk

Mr. JOHN STRACHEY announced on Dec. 16 that the bac ration would have to be reduced from 3 to 2 oz. on Jan. 5 ne This was the effect of the acute world shortage of cereals, a could only be remedied as that shortage was overcome. the other hand, the non-priority milk allowance to the ordin consumer, which last autumn it was feared might not maintained through the winter at even 2 pints, could increased from 2 to $2^1/_2$ pints on Dec. 22.

Extraction-rates for Flour

Mr. STRACHEY, replying to a question, stated that t following extraction-rates had been current during 1946:

Jan. 1–Feb. 23 ..	80%	Sept. 1–Sept. 21 ..	90
Feb. 24–March 9 ..	$82^1/_2$%	Sept. 22–Sept. 30 ..	85
March 10–May 11 ..	85%	October	85
May 12–June 30 ..	90%	November	85
July	90%	First week of December	85
August	90%		

Penicillin Lozenges

Mr. JOHN LEWIS asked the Minister of Health if he wou prohibit the use of penicillin for the production of lozeng which, apart from civilian requirements, were absorb 250 million units for the Service department requirements, view of the fact that a lozenge containing only 500 units penicillin was useless for the treatment of throat infection.—Mr. C. KEY replied: No, Sir. I am advised that lozenges this strength are quite effective.

Dental Benefit

Commander A. H. P. NOBLE asked the Minister of Nation Insurance whether the Dental Benefit Service had now bee resumed throughout the country following upon his recen ght be accommodated for 10*s.* a day.[2] Up to now, about 00 teachers and students, of 42 different nationalities, have en treated, and the library has grown to 17,000 volumes, art from 150 newspapers and reviews.

Dr. Vauthier now plans a far more ambitious scheme— international sanatorium for tuberculous university idents from any country. This also is to be built at Leysin an altitude of over 4400 ft. above sea-level. It will accomdate 200 sick. The governments of Switzerland, Belgium, d Luxemburg are said to have contributed considerable sums wards the realisation of the project.[3]

AN OFFER TO NEGOTIATE

THE Medical Services Guild, which is a constituent of the nfederation of Health Service Employees, was established n years ago as a section of the National Union of County ficers. All its members must belong to their appropriate ofessional organisation, and its doctors all belong to the M.A. Dr. S. W. Jeger, M.P., chairman of the guild, and r. H. B. W. Morgan, M.P., Dr. Mary Barber, Dr. C. W. rook, Dr. W. W. Fox, and Mr. Denis Whitlock, F.R.C.S.E., ho are all members of its medical advisory committee, ite that it is their "convinced opinion that in the event the B.M.A. leadership refusing to negotiate with the Minister, is incumbent upon the confederation to take a lead in presenting the views of those who voted 'yes' in the cent referendum and we shall, therefore, welcome to memberip all those who think like ourselves."

The confederation was set up this year by the amalgamation the Mental Hospitals and Institutional Workers' Union and e Hospitals and Welfare Services Union, and it has a embership of nearly 50,000. It is affiliated with the Trades nion Congress, and its address is 38, Argyle Square, London, .C.1.

NEW NUTRITION BULLETIN

THE first issue of a new two-monthly *Nutrition Bulletin*, ublished by the Central Council for Health Education, is appear next month. The *Bulletin* will deal not with the sic principles of nutrition but with the application of these rinciples to social betterment. It will thus be concerned with e growth of the various nutrition services, the principles nderlying public instruction, the food habits of the comunity, and the place of diet in the national health. The eoretical literature on applied and social nutrition is also be collected. Articles will be concise, topical, and nonchnical. The *Bulletin's* purpose is to inform all who are irectly or indirectly concerned in improving the nation's iet; and the advisory editorial group will carry on the radition established by the *Bulletin* of the Children's Nutrition ouncil. The annual subscription is 3*s.*; and the council's ddress is Tavistock House, Tavistock Square, London, V.C.1.

HOSPITALS

THE *Hospitals Year Book* for 1946—the fourteenth edition n the series—is now obtainable from the central bureau of nformation of the British Hospitals Association, 52, Green Street, Park Lane, London, W.1. Besides being, as usual, n invaluable work of reference it reviews hospital services uring the last decade and gives an account of the forthcoming National Health Service. As the yearbook went to press efore the Bill became law, a review, by Mr. J. P. Wetenhall, ecretary of the association, of the hospital service under he Act has been published as a separate *memorandum*, which should be useful to those who need a clear accurate ummary of the new provisions.

CLIMATE AND COMFORT

WHAT is the ideal climate? Prof. David Brunt, F.R.S., in lecture to the Royal Institution, has suggested that it hould allow a lightly clothed man to walk at four miles an hour in the sunshine without sweating, and to sit in the unshine and stand or sit in the shade or indoors without hivering. With relative humidity of about 60%, the temperaure, if these conditions are to be met, must be between 6° F and 68° F. For a healthy and active life, the mean temperature of the hottest month should not fall much below 0° F or exceed 70° F or at most 75° F, while in the coldest month it should not become difficult to maintain a comfortable indoor temperature. The largest single area approximately satisfying these criteria is Western Europe; in the British Isles the mean temperature of the hottest month lies between 58° F and 62° F, and that of the coldest month between 39° F and 44° F. Probably the best climate in the world is that of New Zealand, where the temperature in the hottest month varies between 62° F and 70° F, and that of the coldest month between 45° F and 52° F. The hottest temperatures which will allow of any activity are 86° F in air of relative humidity 85%, and 95° F in air of relative humidity 25%. Thus, broadly speaking, dry heat is better tolerated than damp heat; but heat-stroke is not uncommon among those exposed to the hot dry "poison wind" of Arabia—the simoom—which, by promoting excessive secretion and evaporation of sweat, causes exhaustion of the glands.

In England the "optimum" indoor temperature in summer is 66° F, and in winter 62°–64° F, as against 76° F and 72° F, respectively, in the United States. An oppressive damp hot climate, said Professor Brunt, is best countered by the open type of house, permitting free air movement, and, if possible, by drying the indoor air. The dry sunny hot climate, on the other hand, calls for a house with double walls and roof, divided by a wide air space and capable of preventing the intrusion of the hot outer air during the day, when ventilation can be increased by fans.

INDUSTRIAL WELFARE

IN the promising change in outlook now spreading through industry, the Industrial Welfare Society is proving an effective catalyst. The annual report claims that during 1945–46 the society provided the means for the exchange of opinions and experiences; and this is confirmed by the popularity of its conferences and the use made of its information service. A generous interpretation of the Reinstatement in Civil Employment Act has been encouraged, and the fact that very few cases came before the reinstatement committees is evidence of the liberality and careful planning of most firms. Many employers are giving thought to the training of young workers, and are willing to release them for part-time non-vocational education, to establish initiation classes for beginners, to set up works training schools, and to send workers to conferences on industrial topics. Wage questions fall outside the society's scope, but job assessment, job description, and merit rating have been studied closely, and a booklet, "Assessing the Job," has been widely read and approved. The society has also been able to suggest equitable arrangements in problems of works discipline, and has reviewed the works handbooks and rules drawn up by many firms to show workers their rights and obligations.

The report notes that the year has been remarkable for the fact that—despite war-time upheavals, rationing of food and goods, and a change of jobs for a third of the working population—strikes have been relatively few, and industrial relations, measured by the experience of other countries and our own experience after the 1914–18 war, have been good. This, the society considers, has been largely due to the organisation of the trade-union movement. The report emphasises the value, in maintaining these good relations, of careful explanations by the management, including foremen, of the firm's policy, and the reason for this or that action. Several firms which have decided to move their factories to development areas have consulted the society about plans for welfare and personnel departments, and a booklet, "Canteens in Industry," has reached a sixth edition; incidentally, some 450 inquiries about canteens were answered—nearly double the number received in the previous year—and visits were made to 114 firms to advise on special canteen problems. The society has also issued a booklet on cloakrooms, washplaces, and toilets, and has considered seriously the question of colour in industry; the report does not give details on this last subject, but it evidently covers the painting of walls and machines in such a way as to conserve lighting and to throw important and potentially dangerous parts of machines into relief—a practice which can materially reduce accident-rates. Voluntary schemes of insurance against sickness and old age are regarded by the Minister of National Insurance as an important supplement to amounts paid by the State—a principle in which the society is taking a great interest. The Catering Wages Act has raised all-round standards for canteen workers, though the report notes that many members of the society have long given conditions above those laid down by the Act. Personnel and welfare officers have taken an outstanding share in smoothing labour problems in this first year of reconstruction. The report notes that many Service men and women have sought advice from the society about taking up personnel and welfare work, but that "circumstances unfortunately made it [illegible] y of these

---

2. See *Ibid.* 1929, 1, 1150.
3. Palmieri, V. M. *Rif. med.* 1946, 60, 514.

tendent to the Radium Institute, a post which he held till 1923. In 1914 he took his M.R.C.P., and in 1921 his D.M.R.E. at Cambridge. Meanwhile he had broadened his experience in his specialty by serving as an assistant in the electrotherapy department of the Royal Cancer Hospital. Later he took charge of the X-ray department at the Italian Hospital, and was appointed visiting radiologist to the Queen Mary's Hospital, Roehampton, while for twenty years he was associated with the Woolwich Memorial Hospital. His aptitude for able work in all branches of radiology left its mark in all these hospitals, but his published work showed his own main interest to lie in the radiological aspects of tuberculosis and cancer. Well known and liked by his colleagues, he was elected a fellow of the Faculty of Radiologists in 1939, and served a term as president of the electrotherapeutic section of the Royal Society of Medicine. During the war he worked continuously, refusing to take even short respites, and his always indifferent health deteriorated greatly during the last two years. A colleague writes: "Lynham was a man of exquisite charm. On occasion his Irish temperament exerted itself, and he was inclined to be a little impulsive and loved argument; but however his views differed from those of his colleagues he never showed malice towards anyone."

Dr. Lynham married Miss Harriet Hopkins in 1912, and she survives him with a son and daughter.

Diary of the Week

DEC. 29 TO JAN. 4

Wednesday, 1st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Surgery* and *Radiology*. Sir Stanford Cade, Dr. J. Ralston Paterson, Mr. W. R. Douglas: Treatment of Carcinoma of the Tongue.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
5 P.M. Prof. W. V. Mayneord: Applications of Atomic Physics in Medicine. (First of six lectures.)

Thursday, 2nd

ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology*. Prof. E. D. Adrian, F.R.S.: General Principles Governing Nervous Activity. (Hughlings Jackson lecture.)

SOCIALIST MEDICAL ASSOCIATION
7.30 P.M. (296, Vauxhall Bridge Road, S.W.1.) Dr. A. T. M. Wilson: Social Aspects of Medical Psychology.

Friday, 3rd

ROYAL SOCIETY OF MEDICINE
5.30 P.M. *Anæsthetics*. Dr. Ronald Jarman, Dr. Frankis Evans: Anæsthesia for Abdomino-perineal Operations.

Births, Marriages, and Deaths

BIRTHS

ADAMS.—On Dec. 11, at Twickenham, the wife of Dr. G. S. Adams—a son.
CARTER.—On Dec. 16, in London, the wife of Dr. A. B. Carter—a daughter.
JACOBS.—On Dec. 9, in London, the wife of Dr. J. J. M. Jacobs—a son.
LENTON.—On Dec. 12, at Clifton, Bristol, the wife of Mr. P. H. Lenton, F.R.C.S.—a son.
McNEIL.—On Dec. 14, at Poona, India, the wife of Major Charles McNeil R.A.M.C.—a daughter
MASON.—On Dec. 15, at Hull, the wife of Mr. J. I C. Mason, F.R.C.S.—a son.
MINETT.—On Dec 14, at Northampton, the wife of Dr. Jack Minett—a son.
PHILPS.—On Dec. 12, in London, the wife of Dr. Richard Philps—a son.
SIMPSON.—On Dec. 17, in London, the wife of Dr. Thomas Simpson—a son.
SLOAN.—On Dec. 6, at St. Albans, the wife of Dr. Oliver Sloan—a son
TEARE.—On Dec. 13, in London, the wife of Dr. Donald Teare—a son.
TOPHAM.—On Dec. 13, at Edinburgh, the wife of Surgeon Lieut.-Commander L. G. Topham, R.N.—a daughter.
YOUNG.—On Dec. 14, in London, the wife of Dr. W. B. Young—a daughter.

MARRIAGES

ALMENT—BACON.—On Dec. 14, in London, Edward Anthony John Alment, M.R.C.S., to Elizabeth Innes Bacon.
STOTT—CAMPBELL.—On Dec. 7, at Nakuru, Kenya, Hugh Stott, M.B., to Helen Campbell.

DEATHS

DATE.—On Dec. 10, at Radlett, William Horton Date, M.D. Durh., late of Exeter, aged 80.
LYNHAM.—On Dec. 14, at Kingston-on-Thames, John Ernest Albert Lynham, M.D. Belf., M.R.C.P., F.F.R.
SUTTON.—On Dec. 17, at Ventnor, the Rev. Samuel Walter Sutton, M.D. Lond., aged 90.

Notes and News

VIENNA'S FOOD

ON Dec. 17 Dr. Harvey S. Collins, medical consult nutrition to UNRRA, described to a press conferenc nutritional state of Vienna, which he previously rev in May.[1] Examination of over 7000 people, complet Sept. 15, revealed that growth in children was re (particularly in those aged between 7 and 13 years) an adults over 40 years of age were definitely under weigl deterioration increasing with age. Œdema of the was present in 6·3% of a sample population, but in 0·3% was it attributable to malnutrition. Clinical ev of vitamin-B deficiency was rare: 0·8% showed signs su ing riboflavin deficiency, while 6·7% showed signs sugg of nicotinic-acid deficiency; there was no clear evide vitamin-B_1 deficiency. No case of scurvy was recorde vitamin-C deficiency was suggested in 0·62%. Signs, pr due to vitamin-A deficiency, were found in 0·71%. The little indication of vitamin-D deficiency in young ch presumably owing to the distribution of preparations co ing this vitamin and preferential milk distribution.

From the middle of March until early November the ration for the normal consumer remained at 1200 calo day, and the average official ration, taking into ac extras for workers, mothers, and others, was 1440 calo day. Although the allocation of food to Vienna has th been the lowest in any large European community, the been no catastrophe. Probably this is because most c secured just enough extra food to prevent progr deterioration. With the coming of winter, sources of supplies may diminish, as they did last year. This in part at least, be offset by the recent increase of the n consumer's rations to 1550 calories, the maintenance of after the end of this year will rest not with UNRRA but wi Austrian government and the occupying powers.

PROFILES

DOES routine work stifle the creative urge? What right preparation for retirement? The Brains Trus been approached more than once for an answer to searching questions. Maybe the College of Physicians be the better arbiter, at least for the medical man. attractive collection of essays before us speaks for its rather for Sir George Newman.[2] No routine can have more exigent or more protracted than that of the first m officer of the Ministry of Health. But the essays here rep which date from this period of his life reveal the workin a spirit free to roam over the field of nature and the v of truth. The rest of us may reach the same destinati other ways, but here is a modern example of Ga assurance *Eppur si muove*.

All but one of these ten essays appeared anonymou the *Friends Quarterly Examiner* during the forty ye Sir George Newman's editorship. He has now acceded to republication under his own name. They include stud George Fox, Thomas Hodgkin, Joshua Rowntree, R Harris, Jane E. Newman, Joseph Rowntree, and others.

INTERNATIONAL SANATORIUM FOR STUDEN

A QUARTER of a century ago (on Oct. 1, 1922, to be e Dr. L. C. Vauthier opened at Leysin the Swiss Univ Sanatorium, of which he is founder and director, fo treatment of tuberculous teachers and students belongi Swiss universities or technical high-schools Here they ca on their studies at regular hours and in regular doses s to each case, and attended regular lectures from ou teachers. They had a library of 2000 volumes and free a to 15,000 volumes in the Leysin library. A year at the torium counted as a scholastic term. It was claimed the work was good for them, giving them a saner out and preserving them from the demoralising effect of u ployment.[1] This arrangement was made possible by the that all teachers and students in Swiss universities and tech high-schools subscribed (teachers fr. 20, students fr. year) towards a university insurance fund. Any of t contracting tuberculosis could obtain treatment in the S University Sanatorium on payment of the equivalent 36s. a week. If there was room, students from other count

---

[1] See *Lancet*, 1946, i, 838.
[2] Quaker Profiles. By Sir George Newman, G.B.E., M.D. Lon Bannisdale Press. Pp. 134. 7s. 6d.

[1] See *Lancet*, 1924, ii, 1087.

INDEX TO VOLUME II, 1946

REFERENCES AND ABBREVIATIONS

nstitutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word Universities. (*A*) = *Annotation,* (*C*) = *Correspondence,* (*LA*) = *Leading Article,* (*ML*) = *Medicine and the Law,* (*NI*) = *New Invention,* (*O*) = *Obituary,* (*P*) = *Parliament, and* (*R*) = *Review.*

A Concordance of page numbers and dates of issue will be found on opposite page

A

baza. A., Acquisitions médicales récentes dans les pays alliés (R) 90
bbie, A. A., Principles of Anatomy (R) 940
bderhalden, E., Grundlagen unserer Ernährung und unseres Stoffwechsels (R) 718
bdomen—abdominal lymphadenitis in children (Baker and James) 232; abdominal symptoms due to calciferol (Ingram, Dawson, Anning, and Dolby) (C) 960; Roentgen Diagnosis of Diseases of Gastrointestinal Tract (Farrell) (R) 238; Surgical Teaching of Abdominal Operations (Spivack) (R) 456; syndrome simulating acute abdominal disease (Goldstone and Le Marquand) 267, (Oram) (C) 363, (Evans) (C) 401, (Goldstone and Le Marquand) (C) 506, (Frankel, Fowler, and Borrie) (C) 884
berystwyth, typhoid fever at, 211, 255, 287, 329, 434
bnormal Behaviour (Gordon) (R) 529
bortion—repeated (Cross) 754; threatened, test for (A) 425
bstracts of World Medicine (A) 278
bstracts of World Surgery, Obstetrics, and Gynæcology (A) 278
ccidents, prevention of, on underground railway, 661
CE (LA) 795
Acetylaminofluorene (A) 242
cid phosphatase, 383
cquisitions médicales récentes dans les pays alliés (Abaza) (R) 90
ctions of Radiations on Living Cells (Lea) (R) 492
ctivation of skin grafts (LA) 350
Addison, Viscount, appointed to Order of Garter, 875
Adenitis, *see* Glands
Adipocere (A) 761
Adler, S., on sandfly-transmitted diseases 23
Adrenal cortex, cancer of, associated with feminisation (McFadzean) 940
Adrenal cortical hormone in convalescence (LA) 203
Adrenalectomy for prostatic cancer (A) 94, (Gutmann) (C) 179
Adrian, E. D., awarded Royal Society's medal, 854
Advertisement of proprietary medicines (Thompson) 280, (A) 762, 776
Aerosols (A) 244
Etiology of infectious and transmissible diseases, 23
Afghanistan, opium traffic in, 610
Africa—chest diseases in Rand miners (A) 952, epidemic thrombophlebitis in East Africa (Manson-Bahr and Charters) 333; gift from South Africa, 625 health services in Southern Rhodesia 395 leprosy in Nigeria (A) 18, malnutrition in South Africa, 57, 108, medical conference in West Africa, 738, South Africa, 100, syndrome simulating acute abdominal disease in West Africa (Goldstone and Le Marquand) 267, (Oram) (C) 363, (Evans) (C) 401, (Goldstone and Le Marquand) (C) 506 (Frankel, Fowler, and Borrie) (C) 884
Aftercare—of ex-Service mental patients 691, Surgical Nursing and After-treatment (Darling) (R) 756
After-images (Edridge Green) 906
Aged—(A) 55, anæsthesia in (LA) 422, care of (Amulree) 801, Medical Aspects of Growing Old (Todd) (R) 162; new words about old age (Howell) (C) 214 (Vertue) (C) 473 (Irvine) (C) 507, prophylactic penicillin in surgical operations on (Power) (C) 32 research on ageing, 240, surgery in (LA) 422
Agglutinins—(A) 912, (Wallerstein) (C) 922; fatal use of dangerous universal donor (Morgan and Lumb) 866, (Sevitt) (C) 959
Agranulocytosis, 677, (Suchecki) (C) 846, *see also* Granulopenia
Agriculture—Association of, 640; Soil Association (Williamson) (C) 33
Aids to Diagnosis and Treatment of Venereal Disease (Osmond) (R) 870
Ainsworth, B., children who spend too long in bed (C) 579
Aircraft, disinfestation of, 929
Aird, I., appointment, 291
Air-raids, deaths from (A) 725
Air transport of casualties (LA) 758
Air travel certificates, 854
Albert F., thanks from Belgium (C) 102
Albert-Weil, J., Phénomènes d'allergie non spécifique dans la tuberculose et les fièvres typhoïdes (R) 908
Albumin, egg-white, in blood-transfusions (Hughes) (C) 579
Aldred Brown, G. R. P. (O) 255
Alginate (A) 279
Alien doctors (P) 135
'Alkathene,' 618
Allen, H. S., variation in female pelvis, 192
Allen, H. W., favus in Devon (C) 399
Allergy—Phénomènes d'allergie non spécifique dans la tuberculose et les fièvres typhoïdes (Albert-Weil) (R) 908
Allowances—entertaining, in Navy (Wakeley) (C) 363; family, 219, (P) 577, 585, (P) 810, tuberculosis (P) 811, 852
Almoners, Institute of (LA) 240
Altitude, high, effect of, on tissues and tuberculosis, 465
Aluminium in silicosis (A) 426
Alves, W., diagnosis of schistosomiasis, 556
'Ambamide' effect of, on biosynthesis of nicotinamide (Ellinger and Emmanuelowa) 716
Amblyopia in prisoners of war (Mitchell and Black) 855
Amboina, prisoners of war in (Hobbs and Forbes) 149
Amenorrhœa, nicotinic acid in (A) 534
America, *see* U.S.A.
American Pocket Medical Dictionary (Dorland) (R) 642
American Practitioner, 875
American Rheumatism Association (A) 570
Amino acids—detection of (Dent) 637; for premature babies (Jorpes, Magnusson, and Wretlind) 228, (A) 240, pre-operative administration of (LA) 203
p Aminobenzoic acid in scrub-typhus (A) 96
p Amino-methyl-benzene-sulphonamide, effect of, on biosynthesis of nicotinamide (Ellinger and Emmanuelowa) 717
Aminosol' (Jorpes, Magnusson, and Wretlind) 228, (A) 240
Amœbic dysentery—nicotinamide methochloride estimations in (Paulley and Aitken) 486, sigmoidoscopy in (Cropper) (C) 473
Amœboma confused with cancer (Smyth) 376, (Hawe) (C) 508
Amphetamine in pulmonary tuberculosis (Houghton and Corrigan) 864
Amplifier for stethoscope, 868
Amputations—465; cineplastic (Magee) 904, (LA) 910; Krukenberg (LA) 910
Amsterdam, problem families in (A) 389
Amulree, Lord, care of elderly, 801
Anæmia—(LA) 680; L'anémie infectieuse (Hemmeler) (R) 492, anti-anæmic liver principle (LA) 532; cardiovascular changes in (A) 496; megaloblastic, in children (A) 461, (Davis) (C) 545, treated with folic acid (Davidson and Girdwood) 373; pernicious (LA) 532, and cancer of œsophagus (Cooke) (C) 472, in children (A) 461, treated with folic acid (Wilkins, Israëls, and Fletcher) 156, (Davidson and Girdwood) 373, (Harrison and White) 787; sickle-cell (LA) 204, 383
Anæsthesia—*Anæsthesia*, 476, 549; and postoperative chests (LA) 910, centenary of, 511, 550, (A) 611, (A) 685; Control of Pain in Childbirth (Lull and Hingson) (R) 384, ether anæsthesia in 1817? (Guthrie) (C) 921, in aged (LA) 422; in labour (A) 388; Physics for the Anæsthetist (Macintosh and Mushin) (R) 718; Postural Circulatory and Respiration Changes During Ether and Intravenous Anesthesia (Gordh) (R) 274; Practical Anæsthetics (Mackenzie) (R) 348; Regional Analgesia (Molesworth) (R) 122
Anaphylaxis—(A) 354; after penicillin (O'Donovan and Klorfajn) 444
Anatomy—anatomical models in teaching (de Seigneux) 302; Illustrations of Regional Anatomy (Jamieson) (R) 304; Manual of Surgical Anatomy (Jones and Shepard) (R) 304· Practical Anatomy Revised and Rewritten (Clark) (LA) 308, Principles of Anatomy (Abbie) (R) 940; teaching of (LA) 308, 329
Anderson, C., Royal College of Physicians of London (C) 438
Andrewes, C. H., influenza B in 1945–46, 927
Androgens—(Gutmann) (C) 179; effect of, on urinary tract (Ucko) (C) 400
Aneurysm, intracranial, 465
Angier, R. B., folic acid (C) 288
Angina pectoris—(Pitt) (C) 884, and testosterone (A) 426
Angiography—Cerebral Angiography with Perabrodil (Engeset) (R) 238
Anhydro-hydroxy-progesterone (Iglesias and Lipschutz) 488
Animal diseases, 24
Annales de Médecine, 930
Anning, S. T., dangers of calciferol (C) 960
Annual Review of Physiology (Luck) (R) 794
Anopheles leucosphyrus (McArthur) 117
Anoxia—611; and renal function (Macgraith and Havard) (C) 213
Anthrax, 24
Anti-anæmic liver principle (LA) 532
Anticoagulants in coronary thrombosis (A) 536
Antigenic properties of spermatozoa, 765
Antiplasmin (Macfarlane and Pilling) 662
Antirabic vaccine, myelitis after (Bussell) 826
Antityphoid inoculation and Sir Almroth Wright (Colebrook) (C) 397, (Guthrie) (C) 681, (Smallman) (C) 694
'ANTU' poison for rats (A) 950
Anuria—splanchnic block for (Bigby, Jones, and MacVine) (C) 365, (Darmady) (C) 681; treated by decapsulation and peritoneal dialysis (Reid, Penfold, and Jones) 749, (Parke) (C) 847, (Danziger) (C) 848
Anxiety and fibrinolysis (Macfarlane and Biggs) 862
Aorta, perforation of (Haines) 455
Appendix abscess, prophylactic penicillin in (Power) (C) 32
Approved societies and dental benefit (P) 699
Archer, V., Osseous System (R) 604
Architecture—Swiss exhibition of planning and building, 585
Argentine harvest (A) 683
Armstrong, T. G., reassurance, 480
Arnott, W. M., appointment, 182, 220
Arsenical chickenpox (Weber) (C) 402, (Reah) (C) 507, (Craddock) (C) 545
Arsenical encephalopathy (Garland) (C) 809
Arsenical therapy followed by myocardial fibrosis (Edge) 675
Art—for ill, 439; King Edward's Hospital Fund art exhibition, 512; medical artists, 853
Arteries, injuries to, 466
Arteriosclerosis (Harris) (C) 849, (Plesch) (C) 885
Arteriovenous fistula (Halle) 85
Arthritis—and desoxycortone (Jennings) (C) 101, (Harrison) (C) 214, (Jennings) (C) 364, (Champernowne) (C) 507; experimental (A) 874; physostigmine in, 540

first-class candidates." This seems to be another example of a curious characteristic of our times: all occupations, including medicine, report a shortage of personnel, but those seeking posts are repeatedly baffled by "circumstances" which keep them from work for which they are trained and fitted, or—if they are young—from training for occupations which are crying out for new candidates.

The society's address is 14, *Hobart Place, London, S.W.1.*

University of Cambridge

The following appointments have been made by the university to Addenbrooke's Hospital, from Oct. 1. Mr. N. R Lawrie, PH.D., biochemist; Dr. A. M. Barrett, morbid anatomist and histologist; and Dr. M. H. Gleeson White, bacteriologist.

University of Manchester

The following were successful in recent examinations:

M.B., Ch.B.—*Joan Hampson (second-class honours)*; C. J. T. Archer, Kathleen Burn, H. S. Coulsting, Dorothy R. Davies, Vera A. Dearden, O. G. Dodge, C. J. Glancy, A. B. Haward, J. B. Howard, S. T. Lunt, Joseph Needoff, E. L. Peel, N. W. Preston, Kathleen Rampling, A. E. Shelswell, Lorinda Wallace, Joan M. Waterfall.

University of Edinburgh

The university has replaced the single diploma in radiology, the D.M.R., by two separate diplomas—one in radiodiagnosis and the other in radiotherapy. Candidates are required to attend courses lasting 18 months and 2 years respectively before examination. The university has also established a diploma in industrial health, the course for which lasts one academic year; candidates must have obtained a certificate in public health before starting on the second term of the final course.

Faculty of Radiologists

The following candidates satisfied the board at the recent examination for the fellowship:

R. J. Keating, G. Simon (both in radiodiagnosis).

Royal Medical Foundation of Epsom College

The council will award next March a pension of at least £30 per annum to a necessitous medical man, aged 55 or over, who has been registered for at least five years. Forms of application, obtainable from the Secretary, Epsom College, Surrey, must be returned by Jan. 30.

London Hospitals Amalgamate

Four members of the governing body of Woodside Hospital for Functional Nervous Diseases, Muswell Hill, have been appointed to the board of the Middlesex Hospital. This follows the amalgamation of St. Luke's Hospital Foundation with the Middlesex Hospital, which will thus have 60 additional beds for the treatment of psychological conditions.

Edinburgh Postgraduate Board for Medicine

The following open lectures will be given at the Royal Infirmary on Tuesdays at 5 P.M.: Jan. 14, Prof. F. A. E. Crew, F.R.S., Death in the Blue Book; Jan. 28, Dr. Douglas Guthrie, Is Medicine Still an Art?; Feb. 11, Prof. A. G. Ogilvie, Human Habitat and Social Geography; Feb. 25, Lieut.-Colonel A. D. Stewart, Hospitals and Hospital Administration; and March 11, Prof. J. H. Gaddum, F.R.S., Introduction of New Remedies.

Staffing the Regional Boards

The Ministry of Health has asked local authorities for a statement of the numbers and types of staff employed at central offices or elsewhere for the purposes of their hospital service, or for groups of hospitals, whom they consider likely to be liable to transfer to the regional hospital boards under the National Health Service Act. Replies are asked for by Jan. 31, 1947. A separate inquiry is being addressed by the Board of Control to the authorities concerned with mental-hospital and mental-deficiency services.

Summer Schools in Health Education

The Central Council for Health Education is to hold two residential summer schools next year—one at Keble College, Oxford, from July 25 to August 8, and the other at Bede College, Durham, from August 20 to Sept. 3. The schools are intended primarily for those who have to do with the training and care of children and young people. Inquiries should be directed to the medical adviser and secretary of the council, Tavistock House, Tavistock Square, London, W.C.1.

London County Council

Dr. E. H. R. Harries will retire from the

of the North-Eastern Hospital of the London County in January, when he reaches the age-limit. He has appointment since he entered the service of the L.C.C. and he has also acted as their smallpox consultant sin In 1935 Dr. Harries was Milroy lecturer to the Roya of Physicians, to whose fellowship he was elected His work as a teacher and counsellor has been recognised, and he has served as president of the fe pitals group of the Society of Medical Officers of and on several committees of the Medical Research He is also joint author of *Clinical Practice in I Diseases.*

Empire Rheumatism Council

At the council's annual meeting in London on I Lord Horder, the president, welcomed the annc that the plan for national action, propounded by the in 1941, was to be operated in principle. The that rheumatic patients would no longer be "the f folk" of public-health administration, recorded, a notable achievement which, even if it stood alone, the campaign. In the new health service each region have special treatment centres linked with peripher centres. The council, said Lord Horder, was invest the causes of rheumatoid arthritis. Two whole-time re had been appointed to deal, in the first instance, w cases. If results were encouraging, 1000 cases w studied, possibly with the help of 4 additional re It was hoped that from this survey, started three mont there might emerge lines for specific research.

Appointments

BEATTIE, MYRA K., B.SC., M.D. Belf.: assistant pathologist, Pathological Laboratory, West Park Hospital.
FREEMAN, D. E., M.B. N.U.I.: M.O., Colonial Service, Solomon Islands Protectorate.
HART, F. D., M.D. Edin., M.R.C.P.: assistant physician, West Hospital.
NEUBERT, F. R., M.D. Lpool, D.O.: ophthalmic surgeon, Hospital, Guernsey.

St. Thomas's Hospital, London:

BATTLE, R. J. V., M.B.E., M.CHIR. Camb., F.R.C.S.: surgeon.
BOURNE, J. G., M.B. Camb., D.A.: anæsthetist.
BOWES, R. K., M.D., M.S. Lond., F.R.C.S.: obstetric physic
CYRIAX, J. H., M.D. Camb.: physician to physiotherapy ment.
FLEMING, J. A. C., M.B. Edin., F.R.C.S.E., F.F.R.: director o therapy.
FURLONG, R. J., M.B. Lond., F.R.C.S.: assistant ort surgeon.
HOVELL, J. H., M.R.C.S., L.D.S.: assistant dental surgeon.
MCLAREN, J. W., M.A. Camb., M.R.C.S., D.M.R.E.: dire X-ray department (diagnostic).
MIMPRISS, T. W., M.S. Lond., F.R.C.S.: surgeon to outpat
NEVIN, R. W., M.B. Camb., F.R.C.S.: surgeon to outpatien
PENMAN, G. G., M.D. Camb., F.R.C.S.: ophthalmic surgeon.
PERKINS, G., M.C., B.M. Oxfd, F.R.C.S.: orthopædic surgeo
RICKFORD, R. B. K., M.D. Lond., F.R.C.S., M.R.C.O.G.: o physician to outpatients.
RIDLEY, N. H. L., M.D. Camb., F.R.C.S.: ophthalmic sur outpatients.
ROBINSON, R. H. O. B., M.B. Camb., F.R.C.S.: surgeon.
WALLACE, H. J., M.B. Camb., M.R.C.P.: assistant physic skin department.
WYLIE, W. D., M.B. Camb., M.R.C.P., D.A.: anæsthetist.

Hospital for Diseases of the Skin, London:

BURFORD, H. G., B.M. Oxfd: registrar.
OWEN, J. R., M.R.C.P.: physician.

Middlesex County Council:

North Middlesex County Hospital:

FERRIMAN, D. G., D.M. Oxfd, M.R.C.P.: physician.
PAGE, B. H., M.B. Camb., F.R.C.S.: surgeon.

West Middlesex County Hospital:

CHIVERS, ELVA M., M.B. Cape Town, D.A.: senior anæsthet

Bristol Royal Hospital:

BARBOUR, R. F., M.B. Edin., M.R.C.P., F.R.C.P.E., D.P.M.: psy ric physician.
CAMPBELL, A. M. G., D.M. Oxfd, M.R.C.P.: physician.
CAPPER, W. M., M.B. Lond., F.R.C.S., M.R.C.O.G.: surgeon.
DAVIES, D. H., M.B. Camb., M.R.C.P.: physician.
EVANS, C. D., O.B.E., M.B. Camb.: dermatologist.
EYRE-BROOK, A. L., M.B. Brist., M.S. Lond., F.R.C.S.: orthop surgeon
HEMPHILL, R. E., M.D. Dubl., D.P.M.: psychiatric physician.
POCOCK, J. A., M.B. Camb., F.R.C.S.: surgeon.

Examining Factory Surgeons:

GRIEVE, M. F., M.B. Edin.: Jedburgh.
HASTINGS, BARBARA V., L.R.C.P.E.: Strathdon.
LOBBAN, A. W. C., M.B. Aberd.: Gamlingay.

s origin (A) 610 ; Hypertonie de
nebration chez l'homme (Mollaret
Bertrand) (R) 456 ; *see also* Menin-

power (LA) 947
—digestibility of high-extraction
nten flours (Booth and Moran) 119,
126 ; for doctors (P) 175 ; for
ol-children (P) 178 ; rationing of
9, (P) 66, (A) 97, (Friend) (C) 102,
135, (P) 577 ; tomorrow's (A) 206 ;
e, for invalids (P) 178 ; *see also*

—*Demodex folliculorum* in nipple
ven) 44
d. H., social psychiatry in treatment
neurosyphilis by induced malaria,
, A. C., on gastrectomy for peptic
, 832
n. J., children who spend too long
d (C) 438
—municipal specialist service, 282 ;
cal area, 876
, H. R., awarded honours, 332
—need for brain-power (LA) 947 ;
War Britain (Marchant) (R) 50
anti-lewisite as antidote to mercury,

Association of Scientific Workers,
(correction) 184
Council, 812
Council for Welfare of Spastics, 889
Empire Cancer Campaign—annual
ng, 957 ; report (A) 242, (correc-
291
Empire Leprosy Relief Association .
l meeting (A) 18
Homœopathic Association and
nal Health Service, 283
Institute of Philosophy (A) 309
Journal of Nutrition, 929
Journal of Pharmacology and
otherapy (A) 278
Journal of Social Medicine (A) 278
Legion (A) 609
Medical Association—and National
h Service Bill (LA) 163, 169, (A)
(LA) 719, (Layton) (C) 958, and
union membership, 917, annual
g, 172, annual representative
g, 169, joint conference with
ation Professionnelle Internation
Medecins [illegible] 565, journals
; *see also* [illegible] lum
Medical J
l staff (A) [illegible] changes in
Medical S[illegible] 52
459 [illegible] Association
Medical Stu
Pharmacopœia [illegible] 331
Social Hyg
Standards I[illegible] 585
[illegible] year book,
Swiss Medi
60, 464 [illegible] 146, 430
X-ray and
uttee's recommendations [illegible] Protection
one, [illegible] 777
ster, dr
H. P.,
[illegible] cliac disease
I. B—
my, 90 [illegible] ction after
infe [illegible] (C) 545
ell) [illegible] nicillin in
R. W [illegible] (C) 471
J. W [illegible] nudes 677
J. M [illegible] R) 202
C) 1 [illegible] vascular
to arteries

award 147
n infancy and

ve surgery of

ular 219
d Disease

diseases in
411

opium
tions from
A 912
LA) 853,
C) 61,
disaster
oral penicillin in gonor-
myelitis after antirabic

C

Cæsarean section (A) 371
Cairns, Sir H., intrathecal streptomycin in meningitis, 153
Calciferol, *see* Vitamin D,
Calcium intake and hypertension (Kesson and McCutcheon) 793, 794, (Harris) (C) 849
Calculating machines (LA) 795
Calf plasma or serum for transfusion (Massons) 341, (A) 355, (Edwards) (C) 437, (Hughes) (C) 570
Calvert, C. A., on development of neurosurgery, 918
Cambridge regional area, 878
Cameron H. C., Nervous Child (R) 756
Campbell, G A , DDT, the Synthetic Insecticide (R) 238
Camping (Williams) (C) 925
Canada—drug addiction in, 510 ; harvest in (A) 683 ; March of Medicine in Western Ontario (Seaborn) 332 ; medical education in (A) 498 ; training of nurses in (A) 610
Cancer—2-acetylaminofluorene (A 242 ;
amœboma confused with (Smyth
Hawe) (C) 505 ; antecedents of, 95 ;
voidable (A) 127, (Twort) (C) 215 ;
British Empire Cancer Campaign (A)
(correction) 291, 957 ; cases,
w-up of, 357 ; control in Liverpool,
genesis of (LA) 797 ; instruction
S.A , 930 ; œstrogens in (Lane)
253, 431, (Fergusson) 551 ; of
nal cortex associated with feminisa-
(McFadzean) 940, of corpus uteri
647, (correction) 702 ; of lung in
muconiosis (Gooding) 891 ; of
hagus and pernicious anæmia
se (C) 472 ; of pancreas (LA) 386 ;
of prostate, adrenalectomy for (A) 94,
man) (C) 179, in animals (Hogg)
34 induced in mouse (Horning) 829,
ted with œstrogens (Lane) (C) 253,
(Fergusson) 551 ; of scrotum (A)
Polipos Cervicais e Afecções
lipoides do Colo do Utero (Dutra)
12 ; prevention and palliation of
A 92 ; research (LA) 92, (LA) 93 ;
ence versus Cancer (Berenblum)
Selected Papers from Royal Cancer
Hospital and Chester Beatty Research
Institute (R) 12 ; X-ray Treatment of
ssible Cancer (Smithers) (R) 50
a, needle and, for chest exploration
dill) (NI) 530
ary fragility (A) 16
ary micro-copy (A) 645
l punishment, 813
tion fee, National Health Insurance
166, 331, (A) 388, (A) 608, panel
ference, 649
hydrate—absorption in sprue effect
phosphate on (Maegraith) (C) 599,
nus) (C) 436, (Maegraith) (C) 471 ;
ohydrate Metabolism (Soskin and
ne) (R) 566 ; metabolism, 956
n 14 (A) 535
ma, *see* Cancer
see Heart
vascular, *see* Heart
see Dental caries
E. R., regional boards (C) 771
d ligation in intracranial aneurysm,
ater, K J , pellagragenic activity of
ole-3 acetic acid, 491
ers—nasal (LA) 164 ; typhoid, detec-
n of, 286, treated with penicillin and
lphathiazole (Comerford, Richmond,
d Kay) 343, (A) 353
er G B., nursing (C) 768
ography, medical (A) 167
in hydrolysate for premature infants
orpes, Magnusson, and Wretlind) 228,
A) 240, (Mackay) (C) 400
dy, Sir M., coronary disease, 587
stellani, A., funiculitis (C) 398
stration, effects of (A) 94
ualties, air transport of (LA) 758
sualties Union, 929
atalogues of films 888
ataract, intracapsular extraction of (A) 19
atering, hospital, in Middlesex (A) 425
Catheters—catheterisation after vaginal plastic operations, 793 ; method of curving (Lane) (C) 398
Cathie, I. A. B., blood-groups in bone-marrow, 418
Cats—alleged cruelty to (ML) 64, (ML) 577, (P) 772 ; tongue of, 30
Cavernostomy, 842
C.cm. or ml.? (Beaumont) (C) 33, (Hamill) (C) 61, (Beaumont) (C) 179, (Hamill) (C) 253, (Beaumont) (C) 290
Cells—Actions of Radiations on Living Cells (Lea) (R) 492 ; Biology of Tissue Cells (Fischer) (R) 678

Census of hospital cases in Stirlingshire, 331
Central Association for Mental Welfare, 701
Central Council for Health Education, 35, 256, 511
Central Council of Physical Recreation, 930
Central Midwives Board report for 1946, 510
Cephalin-cholesterol flocculation test (Maizels) 451
Cereal exports to Europe (P) 772
Cerebral Angiography with Perabrodil (Engleset) (R) 238
Cerebral palsy (A) 354
Cerebrospinal fluid—chlorides in (A) 723 ; tubercle bacilli in, 528, (Roberts) (C) 769, (Shamyeh) (C) 810
Cerebrospinal meningitis, sulphonamides in (Fluker) (C) 435
Certificates—air-travel, 854 ; birth (ML) 771, (P) 887 ; for patients attending osteopath (P) 178 ; milk priority, 614, 661, 692, (P) 699, (P) 886, 957
Cervical polypi—Polipos Cervicais e Afecções Polipoides do Colo do Utero (Dutra) (R) 12
Cervical spine, fracture of, zygomatic traction for (Batchelor) (NI) 202
Ceylon—malnutrition in, 57, (A) 950 ; opium traffic in, 510
Chalk in national flour, 245, (Graham-Little) (C) 254, (Harris) (C) 546, (P) 577, (Harris) (C) 849
Chamberlain, D., appointment, 813
Champernowne, D. G., desoxycortone and arthritis (C) 507
Changi, deficiency diseases in prisoner-of-war at (Burgess) 411
Chapman, P. D. H., psychoneurosis treated with electrical convulsions (C) 808
Charity, legal definition of (ML) 470
Chartered Society of Physiotherapists (A) 461
Charters, A. D., epidemic thrombophlebitis, 333
Cheese, infected (LA) 607
Chelsea pensioners (Amulree) 802
Chemical competition (A) 55
Chemical Society ; centenary, 107
Chemistry and Physiology of Hormones (Moulton) (R) 456
Chemotherapy—(A) 55 ; chemotherapeutic mists (A) 244 ; of influenza (A) 277 ; of malaria, 23 ; of scrub-typhus (A) 96 ; of tuberculosis, 99
Chest—bronchial infections, inhaled penicillin in (Southwell) 225, (A) 244 ; complications of chest surgery, prophylactic penicillin in (Power) (C) 32 ; diabetic pleurisy (A) 55 ; Diagnosis and Management of Thoracic Patient (Bailey) (R) 642 ; disease in Rand miners (A) 952 ; exploration, needle and cannula for (Medill) (NI) 530 ; postoperative (LA) 910 ; primary pleurisy with effusion, 89 ; *see also* Heart, Lungs, Pleurisy
Chester Beatty Research Institute—Selected Papers from Royal Cancer Hospital and Chester Beatty Research Institute (R) 12
Chick, H., malted foods for babies, 601
Chickenpox, arsenical (Weber) (C) 402, (Reah) (C) 507, (Craddock) (C) 545
Chilblains (Winner and Cooper-Willis) 663
Child Guidance Council, 701
Childbirth—*see* Labour
Children—abdominal lymphadenitis in (Baker and James) 232 ; boarding-out of (A) 949 ; boarding-schools, L.C.C., 812, State, 323 ; boys and police, 729 ; boys, wild, 929 ; care of, 648, (P) 659, (P) 886, (P) 962 ; Child and Adolescent Life in Health and Disease (Craig) (R) 604 ; child care, origins of (LA) 871 ; child health, teaching in (LA) 13, (McNeil) (C) 148, (A) 683 ; child mortality during war (A) 390 ; childhood environment (Halliday) 186 ; Children on Trial (film), 439 ; children who spend too long in bed (McCluskie) 302, (Storr) (C) 363, (Tripp) (McCluskie) (C) 399, (Storr) (Brisden) (C) 438, (McCluskie) (C) 546, (Ainsworth) (C) 579 ; children's hamlet at Trogen, 585 ; Curtis report, 648 ; deaf, welfare of (A) 800, (Edwardes) (C) 923 ; diplegic, schools for (A) 354, 624 ; education of subnormal, 467 ; folic acid in cœliac disease (Brody and Gore) (C) 618, (Dalton, Thomson, and Wilson) (C) 652 ; grey hair in ill-nourished (Nicholls) 201 ; holiday milk for school-children (P) 69 ; homeless (A) 129 ; in day nurseries (Menzies) 499, (Kershaw) (C) 544, (Edelston) (C) 581 ; infant mortality in British zone of Germany (P) 218 ; Juvenile Delinquency in New Zealand (Philipp) (R) 832 ; megaloblastic anæmia in (A) 461, (Davis) (C) 545 ; milk for children at school, 211 ; National Conference on Maternity and

cortone and arthritis (Jennings)
101, (Harrison) (C) 214, (Jennings)
364, (Champernowne) (C) 507
b, H., Psychology of Women (R) 946
e's disease (Leitner and Moore) 262
—favus in (Allen) (C) 399; regional
, 876
, T., Textbook of Forensic Pharmacy
348
tes—Diabetes (John) (R) 908; dia-
o pleurisy (A) 55; experimental
etes mellitus, 466; Modern Treat-
t of Diabetes Mellitus (Collens and
) (R) 642; Primer for Diabetic
ents (Wilder) (R) 870
sis—Diagnosis and Management
Thoracic Patient (Bailey) (R) 642;
tory, of smallpox (A) 205; of
rculous pericarditis (A) 245; Pedia-
X-Ray Diagnosis (Caffey) (R) 456;
ntgen Diagnosis of Diseases of
trointestinal Tract (Farrell) (R) 238
ls in uræmia (LA) 720, (Reid,
fold, and Jones) 749, (Parke) (C) 847
ea—infantile, 926, (A) 951, in
rnity homes, 962; in prisoners-of-
(Mitchell and Black) 855; neonatal
951
W. P., home contacts of tuberculous
ms, 791
R. F., appointment, 549
H. V., appointment, 183, 292
marol in coronary thrombosis (A) 536
nary—American Pocket Medical Dic-
ary (Dorland) (R) 642; Spanish-
ish Medical Dictionary (McElligott)
820
(Forbes) 293; hospital catering in
dlesex (A) 425; in convalescence
) 203; in dental caries (LA) 16;
U.S.A., 201; national dietar
ory (P) 811; of prehistoric man
; of prisoners-of war at Singapore
rgess) 411, in Amboina (Hobbs and
bes) 149, in Far East (Mitchell and
ck) 855, in Germany (Leyton) 73,
Java (Hobbs and Forbes) 149
pical Nutrition and Dietetic
cholls) (R) 604
arma-Pl Association 476
ibility of high extraction wheaten
rs (Booth and Moran) 119
70
rodesoxymorphine added to Poisons
625
yl phthalate 451 512, (A) 571
s and luncheons Association of
ulture, 540 Association of Anæs
usts of Great Britain and Ireland
; British Orthopædic Association
; Buckston Browne dinner, 765
erden Society [illegible] International
ical Conference, 502, London
pital, 626; Middlesex Hospital,
Royal College of Obstetricians
Gynæcologists [illegible] Royal Medico
hological Association 184
eria—immunisation against (P) 135
, (Boyd) 195 (P) 218 in Scandinavia
206; mortality during war (A) 390
onjunctiva (Miller and Blower) 345
ents nursed without pillow (Egan)
398; sporotrichosis resembling
ks) 270
cs, see Spastics
n in Industrial Health [illegible]
d—Disabled Persons Employment
ration Ltd, 84[illegible] 58 in industry
3; motor car for 14[illegible] work for, 839
tation of aircraft 92[illegible]
ing of drugs in hospitals (Wilson)
2
nated sclerosis [illegible] (Russell) (C) 582
o, effects of on nerve and muscle
ning) 109
sis (Verney) 759 779 (McCracken)
882, (LA) 948
, T. F., appointment, 468
., 434, 512 (A) 571
re, reablement of 839
—alien (P) 135 and trade unions
(A) 838 (A) 875, (P) 886 917,
ulsion for (Roche) (C) 63; Doctors
r (A) 950 employment of demo
d (P) 851 in Services (LA) 421
trials of (A) 798 posts for demo
l (A) 610, release of specialists
Forces (P) 217 remuneration of
51, resettlement of (P) 658
one bureau [illegible] unemployment
(Graham Little) (C) 180, (A) 722
E. C., on œstrogens in cancer, 431
ncer of prostate in (Hogg) (C) 734
E., dangers of calciferol (C) 960
C. E. medical education in
and U.S.A. (A) 498
B., circulation in kidney (C) 362
W. A. N. American Pocket
Dictionary (R) 642
D. M. figures facts, and fancies
H. B., on treatment of lupus, 528

Drever, J., on education and psychiatry, 160
Drew, W. R. M., appointment, 404
Drowning, resuscitation from, 542
Drugs—dangerous, traffic in, 279; dispensing of, in hospitals (Wilson) (C) 402; Drug Supervisory Body, 549; narcotic, traffic in, 510, control of, 549; proprietary, advertisement of (Thompson) 280, (A) 762, 770
Drummond, Sir J., on production of streptomycin, 529
Duck eggs (LA) 607
Dudgeon, J. A., influenza B in 1945–46, 627
Duff, D. G., leucotomy technique, 639
Dukes, C. E., Bacteria in Relation to Nursing (R) 916
Dunham, W., plebiscite (C) 770
Duodenal ulcer, see Peptic ulcer
Durham, M. P., vitamin-C survey of medical students, 937
Dust in spread of infection (LA) 681
Duthie, E. S.—intrathecal streptomycin in meningitis, 153; penicillin in wound exudates, 405
Du Toit, J., on animal diseases, 24
Dutra, L. H., Polipos Cervicais e Afecções Polipoides do Colo do Utero (R) 12
Dwellings, design of (LA) 123, (Nash) (C) 212, (Saward) (C) 290, (Spoor) (C) 303
Dynamic State of Body Constituents (Schoenheimer) (R) 946
Dysentery—amœbic, sigmoidoscopy in (Cropper) (C) 473; Bacillary Dysentery, Colitis, and Enteritis (Felsen) (R) 122; bacillary, treated with sulphaguanidine, in Burma (LA) 758; in mental hospitals, 690; in prisoners-of-war (Mitchell and Black) 855
Dysmenorrhœa, nicotinic acid in (A) 534
Dyspnœa in anæmia (A) 496
Dystocia in multiparæ, 793

E

Ear—Year Book of Eye, Ear, Nose, and Throat, 1945 (Bothman, Crowe, and Hagens) (R) 832
East Africa, epidemic thrombophlebitis in (Manson-Bahr and Charters) 333
East, Far—painful feet in prisoners-of-war in (Cruickshank) 369; visual defects in prisoners-of-war from (Hobbs and Forbes) 149
East Indies—malaria transmission in Borneo (McArthur) 117
East T., Cardiovascular Disease in General Practice (R) 384
East W. N., on legal aspects of psychiatry, 1
Ebbell D., tuberculous abscess following intramuscular penicillin, 379
Ectopic pregnancy ruptured into urinary bladder (Forshaw) 716
Eddison, C. R., Christian Science (C) 609
Eddelston, H., children in day nurseries (C) 581
Eden, T. W., death of, 462, (O) 509
Edge, J. R., myocardial fibrosis after arsenic, 675
Edholm, O. G., sympathetic control of blood-vessels, 513
Edridge-Green, F. W., retinal mechanism of vision, 906
Education—(A) 311, examinations, 330, health (Kennedy) 427, (Mathers) (C) 616; in child health (LA) 13, (McNeil) (C) 143, (A) 683; in relation to psychiatry, 160; medical, anatomical models in (de Seigneux) 302, in Canada and U.S.A. (A) 498, in Queensland, 248, in U.S.A., effect of war on, 4; of deaf (P) 810; of subnormal child, 467; postgraduate, 326, future of (LA) 91; Pre-School Centres in Australia (Cumpston and Heinig) (R) 90; State boarding-schools, 523; Students Guide, 313; see also Teaching
Edwardes, E., welfare of deaf children (C) 923
Edwards, A. T., death of, 332, (O) 365
Edwards, F. R., calf serum for transfusion (C) 437
Edwards, H. C., perforated peptic ulcer treated without operation (C) 544
Egan, J., myth and mumpsimus (C) 398
Eggs—infected (LA) 607; inoculation of (A) 799
Egg white albumin in blood transfusions (Hughes) (C) 579
Egham, 839
Egypt—hashish and opium in, 510; tropical eosinophilia in (Stephan) 236
Eire, outbreak of poliomyelitis in (Deeny and MacCormack) 8
Elam, J., death after curare (C) 508
Electrical convulsion therapy, see Psychiatry
Electro Acoustics Committee (A) 800

Electrocardiogram, effect of meals on 762
Electro-encephalograms after leucoto 907
Electronic brain (LA) 795
Electroplexy, see Psychiatry
Elek, S. D., tuberculous abscess af intramuscular penicillin, 379
Ellinger, P., effect of p-amino-methy benzene-sulphonamide on biosynthes of nicotinamide, 716
Elliot, W.—parliamentary candidature o 585; election of, 887
Ellis, R.—appointment, 292, on child car (LA) 871
Ellman, P., B.O.G. (C) 435
Emergency Bed Service (Peers) (C) 289
Emmanuelowa, A., effect of p-amino-methyl-benzene-sulphonamide on biosynthesis of nicotinamide, 716
Emotion and diuresis (Verney) 740
Empire Rheumatism Council, 585, 650, 966
Empire Tea Bureau, 107
Employment—and trade-unions, 332, (A) 838, (A) 875, (P) 886, 917; of mentally handicapped, 763, 839; see also Disabled
Encephalomeningitis of virus origin (A) 610
Encephalomyelitis in glandular fever (Gellebter) 753
Encephalopathy, arsenical (Garland) (C) 809
Endocarditis, infective, heparin in (A) 535
Endocrinology—endocrine treatment of enuresis (Ucko) (C) 400; endocrines and tumorigenesis (LA) 797; Gynæcological Endocrinology for Practitioner (Bishop) (R) 750; 1945 Year Book of Neurology, Psychiatry and Endocrinology (Reese, Masten, Lewis, and Sevringhaus) (R) 420, 492; see also Œstrogens
Endometritis, tuberculous, and sterility (A) 354, (Sharman and Sutherland) (C) 506
Engeset, A., Cerebral Angiography with Perabrodil (R) 238
England, changes in, 729
ENIAC (LA) 795
Enteritis—Bacillary Dysentery, Colitis, and Enteritis (Felsen) (R) 122
Enterogastrone (Hubacher) 272, (LA) 275
Enuresis (A) 243, (Ucko) (C) 400
Enzymes isolated from muscle, 956
Eosinophilia, tropical, in Egypt (Stephan) 236
Ephedrine in enuresis (A) 243
Epidemiology—23; and psychosomatic affections (Halliday) 185; infectious diseases (Tomb) (C) 653; kerato-conjunctivitis in Bengal (Thorne) 715; poliomyelitis in Mauritius (Seddon, Hawes, and Raffray) 707; thrombophlebitis in East Africa (Manson-Bahr and Charters) 333; see also Influenza
Epididymitis, non-specific (Bottley) (C) 473, in industry (Whitwell) (C) 360
Epilepsy—pyridoxine in (Fox and Tullidge) 345; 'Tridone' in, 550
Epimenorrhœa (A) 460
Epsom College, 70
Erysipeloid (King) 196, (A) 874
Erythroblastosis fœtalis (A) 212, 793, (Wallerstein) (C) 922
Erythrocyte-sedimentation rate—and calciferol (Feeny) (C) 288; effect of temperature on (Rogers) 520
Ether—anæsthesia in 1817? (Guthrie) (C) 921; and postoperative chests (LA) 910; autoxidation of, 219; Postural Circulatory and Respiration Changes During Ether and Intravenous Anesthesia (Gordh) (R) 274
Europe—food parcels for (P) 851; harvest in (A) 683; winter in (A) 569
Evans, P., syndrome simulating acute abdominal disease (C) 401
Evans, R. W.—on sickle-cell anæmia, 383; penicillin sensitivity of *Bact. typhosum*, 113
Everybody's Way to Health and Fitness (Togna) (R) 12
Examinations, 330
Exercise and cardiac hypertrophy (Abrahams) 565, (Herxheimer) (C) 809, (Lambert) (C) 885
Exhibitions—Britain Can Make It, 469; Empire Tea Bureau, 107; King Edward's Hospital Fund art exhibition, 512; London Medical Exhibition, 776, 845; of British books in Switzerland, 331; of Ethiopian art and industry, 890; Swiss exhibition of planning and building, 585
Expenses, medical, and income-tax (P) 30
Experiments on prisoners in Germany (A) 798, (Mellanby) (C) 850, (Layton) (Nelson-Jones) (C) 882, (Klein) (Stewart) (C) 961
Experiments with Mammalian Sarcoma Extracts (Krebs, Thordarson, and Harbo) (R) 384
Eyes—amblyopia in prisoners-of-war (Mitchell and Black) 855; intracapsular extraction of cataract (A) 19; Introduction to Clinical Perimetry (Traquair) (R) 642; kerato-conjunctivitis

Postural Circulatory and
Changes During Ether and
ms Anesthesia (R) 271
M., tick paralysis (C) 735
G., Abnormal Behaviour (R)

perforated peptic ulcer treated
operation (C) 544
olic acid in cœliac disease (C) 618
B., death after curare (O) 472
kæmia (Shorton) 378
at in Public Health (Mustard) (R)

erating, 220
; ring (Pyke) (C) 580, 852
n, activation of (LA) 350
onnalie, F. E., rubber gloves (C)

. D. P., death after curare (C) 508
ttle, Sir E.—further challenge
cal Act (C) 62; national loaf
: unemployment among doctors

S (Gause) 46
r—medical research (P) 217;
ties (A) 205, (P) 217
, malignant, of nose (Hargrove,
and Rhodes) 596, (Marsh) (C)

ula, sulphonamide, in children
, (Sochecki) (C) 846, (Fletcher)

, on tuberculosis, 466
n education and psychiatry, 160
., on gastrectomy for peptic ulcer,

. W., What People Are (R) 202
ission, 403
. D., on electro-encephalograms
ectomy, 907
. W., death of, 611, (O) 659
A., Manual of Diagnosis and
nent of Peripheral Nerve
(R) 832
M. E., thrombosis of inferior
va, 808
n unserer Ernährung und unseres
hsels (Abderhalden) (R) 718
., fertility survey, 687
—on pertussis, 40; on use of
blood derivatives for transfer
y, 870
V. P., visit to Finland, 431
D.—ether anæsthesia in 1817 !
; Sir Almroth Wright and anti-
inoculation (C) 581
D., adrenalectomy for prostatic
C) 179
ones, W. T. (O) 366
y—Gynæcological Endocrine
the Practitioner (Bishop) (R) 756
l Handbook of Midwifery and
logy (Haultain and Kennedy)
; Symptomatic Diagnosis and
ent of Gynæcological Disorders
(R) 566

H

inometry [illegible]
ago—hæmoptysis treated by arti
neumoperitoneum (Benatt) 234
from seaweed (A) 279, treated
tin (A) 16, uterine (A) 460
E. W., Year Book of Eye, Ear,
nd Throat 1945 (R) 832
arteriovenous fistula, [illegible]
I., perforation of aorta, [illegible]
ey, in ill nourished children
ls) 201
F. P., psychiatry at corps
ion centre, 599
paratyphoid B suspected in, 287
ze, 930
J. L., epidemiology and psycho-
affections, 18
.M., c.cm or ml ? (C) 61, (C) 253
-Paterson, J. L., Penicillin in
l Practice (R) 678
urns, tannic acid for (Stonham)
; mechanical (Magee) 904, (LA)
reconstructive surgery of (LA) 53
k of Social Psychology (Young)
4
W. S., coronary disease (C) 807
I. (O) 62
P., medical photography, 296
F. C., appointment, 813; lectures, 99
-gold medal, 147
., Experiments with Mammalian
a Extracts (R) 384
, appointment, [illegible], 291
—Inheritance of Hare-lip and
Palate (Fogh Andersen) (R) 122
-Wilson, W., London College of
athy (C) [illegible]
es, G. R., on mental health, 763
es, W. H., accidental laboratory
n with tsutsugamushi rickettsia, 4

Hargrove, S. W. G., malignant granuloma of nose, 596
Harkness, A. H., oral penicillin in gonorrhœa, 783
Harley, D., 'Benadryl' in hay-fever, 158
Harper, F. A., World's Hunger (R) 791
Harpman, J. A., penicillin in mastoidectomy (C) 808
Harrens, B. S., valgus foot strain, 490
Harris, I.—hypertension and calcium intake (C) 849; national loaf (C) 546; Studies in Hypertony (R) 794
Harris, L. J., pellagragenic activity of indole-3-acetic acid, 491
Harris, R. S., Vitamins and Hormones (R) 122
Harris, R. W., National Health Insurance in Great Britain 1911–46 (A) 760
Harris, Sir J., death of, 471
Harrison, R. G., desoxycortone and arthritis (C) 214
Harrison, R. J., folic acid in pernicious anæmia, 787
Harveian oration, 587
Harvest (A) 683
Harvey, C., on artificial insemination, 756
Harvey, W. C., Milk: Production and Control (R) 908
Hashish, traffic in, 279, 510
Havard, R. E., anoxia and renal function (C) 213
Haverhill fever (A) 875
Hawe, P., amœboma and cancer (C) 608
Hawes, E. I. B., poliomyelitis in Mauritius 707
Hay-fever—'Benadryl' in, 35, (Harley) 158; direct test for blocking antibody in treated (Maunsell) 199
Haythornthwaite, I. M. (O) 811
Heaf, F., research on tuberculosis (C) 290
Health—Central Council for Health Education, 35, 256, 511; centres (Roe) (C) 884 in U.S.A., 475; education (Kennedy) 427, (Mathers) (O) 616; Everybody's Way to Health and Fitness (Togna) (R) 12; national health scheme in Australia, 803; services in Colonies (P) 104 Southern Rhodesia, 395; World Health Assembly, 142, (Goodman) 358; World Health Conference, 58, 99, 142, (Goodman) 358; World Health Organisation, 142, (Goodman) 358, (A) 790; *see also* Children, Industrial health, Industry, Mental health, National Health Insurance, National Health Service Act, Public health
Hearing, binaural, 212; *see also* Deafness
Hearing-aids (P) 30, (Stevens) (Constantine) (C) 63, (A) 800, 839; 'Omnipac,' 776
Heart—cardiovascular changes in anæmia (A) 496; Cardiovascular Disease in General Practice (East) (R) 381; cardiovascular disturbances in prisoners-of-war (Mitchell and Black) 855; cases, reablement of, 839; coronary disease (Cassidy) 587, (Ryle) (C) 692, (Bashford) (C) 768, (Handley) (C) 807, (Pitt) (C) 884, (Beaumont) (Plesch) (C) 885, (Symons) (C) 961, coronary occlusion in young adults (Newman) 409, (Holzer and Polzer) (C) 846, coronary thrombosis, anticoagulants in (A) 536, disease (Forbes) 294; effect of meals on electrocardiogram (A) 762; failure, 430, fluids in (A) 54, heparin in infective endocarditis (A) 535, hypertrophy and exercise (Abrahams) 565, (Herxheimer) (C) 809, (Lambert) (C) 886; in pneumoconiosis (Gooding) 891; myocardial fibrosis after arsenic (Edge) 675; signs in young adults (Bourne) 770; tuberculous pericarditis, diagnosis of (A) 245
Heath case (ML) 541
Heath, C. W., What People Are (R) 202
Heating of houses (LA) 123
Heffernan, H. N., psychiatric disability among British officers in India, 257
Heggie, J. F., circulation in kidney (C) 436
Heinig, C. M., Pre-School Centres in Australia (R) 90
Hemmeler, G., Anémie infectieuse (R) 492
Henry, S. A., on cancer of scrotum (A) 127
Heparin—dangerous to newborn (Wallerstein) (C) 922; in coronary thrombosis (A) 536, in infective endocarditis (A) 535
Hepatitis—empirical tests of liver function (Maizels) 451; homologous serum (Smith) (C) 212, liver-function tests in (LA) 947, post-hepatitis syndrome (Sherlock and Walshe) 482; serum in (LA) 947
Herbalist summoned (ML) 31
Heredopathia Atactica Polyneuritiformis (Refsum) (R) 832
Hernia—through foramen of Winslow (Gillis) 48; through lesser omentum (Aylett) (C) 735
Herpes, recurrent, treatment of (Whitfield) (C) 367
Herxheimer, H., exercise and cardiac hypertrophy (C) 809
Herz, E., Motor Disorders in Nervous Diseases (R) 870

Heuer, G. J., Treatment of Peptic Ulcer (R) 202
Hill, H., Milk: Production and Control (R) 908
Hill, K. R., penicillin in yaws, 522
Hingson, R. A., Control of Pain in Childbirth (R) 384
Hip, arthrodesis of (Patrick) 9
Hirsch, W. P., early ovulation (C) 582
Hitler's neurological state, 920
Hobbs, H. E., visual defects in prisoners-of-war, 149
Hoffstaedt, E. G. W., military service for medical students (C) 506
Hogg, A. H., cancer of prostate in animals (C) 734
Hokey-pokey (A) 391
Holland—Dutch school, 25; 'problem families in Amsterdam (A) 389
Holland, E., demobilised would-be specialists (C) 143
Holman, C., Treatment of Peptic Ulcer (R) 202
Holmes, G., Introduction to Clinical Neurology (R) 456
Holten, C., thiouracil in thyrotoxicosis (C) 695
Holzer, W., coronary occlusion (C) 846
Homes, convalescent (LA) 508, (Roxburgh) (C) 652
Homœopathy in National Health Service, 283
Honeyman, W. M. (O) 887
Honours—Brazilian, 440; Canadian, 100; French, 220, 332; *see also* On Active Service
Hood, Sir A., presentation to (A) 572
Hormones—and cancer of prostate (Horning) 829; antidiuretic (Verney) 739; Chemistry and Physiology of Hormones (Moulton) (R) 456; effect of sex hormones on urinary tract (Ucko) (C) 100; relations of steroid hormones and anhydro-hydroxy-progesterone to fibromatosis (Iglesias and Lipschutz) 488; Vitamins and Hormones (Harris and Thimann) (R) 122; *see also* Œstrogens
Horner, G., retirement of (A) 952
Horning, E. S., induction of cancer in prostate of mouse, 829
Hospitals—accommodation for mentally defective (P) 811, and chronic sick (Ives) 915; and reablement, 839; catering in Middlesex (A) 425; census of hospital cases in Stirlingshire, 331; Chinese hospital, 767; dispensing of drugs in (Wilson) (C) 402; domestic help in (A) 95; domestic staff of (P) 658, (P) 772; Emergency Bed Service (Peers) (C) 289; food bulletins for, 510; food gifts for (P) 218; Hospitals Year Book, 965; in U.S.A., 475; King Edward's Hospital Fund for London, 34, (A) 95, 510, 511, 614, (A) 913, (P) 963; largest hospital in Britain (MacIver) (C) 695; L.C.C. hospital committees, 182; length of stay in (Gardner and Witts) 392; liability of (ML) 771; local responsibility for, 511; lock (A) 17; management committees of, 103; Manchester's proposed hospital (A) 534; medical staff of (A) 725; mental, in National Health Service (A) 94, report of Board of Control, 1945, 690; nationalisation of (P) 30, (LA) 757; of the future (A) 534; photographic departments of (Stanford) 299, (Treadgold) (C) 509; regional survey of north-east, 919; regions, proposed (P) 658; sharing of nursing staffs of (P) 887; size of, 210; voluntary, of London, 614; "walking hospital," 881; *see also* National Health Service Act

HOSPITALS.—Bromley and District Hospital, 930; Central Middlesex Hospital, 853; Infants Hospital, Vincent Square, 475; King's College Hospital, London (A) 207; London Hospital, 926; London Lock Hospital (A) 17; Maudsley Hospital, 889, 930; Middlesex Hospital, 476, 550, 966; Royal Cancer Hospital (R) 12; Royal Hospital, Chelsea (Amulree) 802; Willesden General Hospital (P) 851; Woodside Hospital for Functional Nervous Diseases, Muswell Hill, 966

Hostels for aged (Amulree) 801
Houghton, L. E., amphetamine in pulmonary tuberculosis, 805
Houghton, M., nursing (C) 693
Hounslow, A. G., tuberculosis following injection (C) 617
Houses, design of (LA) 123, (Nash) (C) 212, (Saward) (C) 290, (Spoor) (C) 363
Housing, 34, (LA) 351, (P) 657
Houtz, S. J., Manual of Diagnosis and Management of Peripheral Nerve Injuries (R) 832

in Bengal (Thorne) 715; muscle forceps for squint operation (Klein) (NI) 907, nutritional retrobulbar neuritis (Moore) 246, (Wright) (C) 401; Ocular Prosthesis (Prince) (R) 274 · primary diphtheria of conjunctiva (Miller and Blower) 345; retinal mechanism of vision (Edridge-Green) 906; Textbook of Ophthalmology (Gifford) (R) 12; visual defects in prisoners of-war (Hobbs and Forbes) 149; Year Book of Eye, Ear, Nose, and Throat, 1945 (Bothman, Crowe, and Hagens) (R) 832

F

Faculty of Ophthalmologists, 777
Faculty of Radiologists, 549, 966
Fairley, N. H.—appointment, 182, 220; on chemotherapy of malaria, 23; on 'Paludrine,' 640
Fallopian tubes, penicillin via (Frisk and Westman) 118
Family—allowances, 219 (P) 577, 585, (P) 810; childlessness and small family (Titmuss and Grundy) 687, Family Planning Association, 439, 755; planning clinics, 210; problem, in Amsterdam (A) 389; size of (Baird) 43
Famine—dangers of, in Germany (P) 731; effects of slow starvation (Leyton) 73; in India, 60
Far East—painful feet in prisoners-of-war in (Cruickshank) 369, visual defects in prisoners-of-war from (Hobbs and Forbes) 149
Farrell, J. T., Roentgen Diagnosis of Diseases of Gastrointestinal Tract (R) 238
Fat-digestion in sprue (Smart and Daley) 159
Favus in Devon (Allen) (C) 399
Fear and fibrinolysis (Macfarlane and Biggs) 862
" Fear No More," 219
Feeny, P. J., calciferol and sedimentation-rate (C) 288
Feet—models of, 468, painful (Cruickshank) 369, (A) 912; pulsation in (A) 496; ringworm of (A) 95, *valgus* strain of (Bailey and Harrens) 490
Feldman, W. H.—awarded Alvarenga prize, 147, on chemotherapy of tuberculosis, 99
Felsen, J, Bacillary Dysentery, Colitis, and Enteritis (R) 122
Feminisation associated with carcinoma of adrenal cortex (McFadzean) 940
Fergusson, J. D., carcinoma of prostate treated with œstrogens, 551
Ferriman, D., penicillin by inhalation (C) 398
Fertility—(Baird) 41; hyaluronidase in fertilisation, 755, survey in Luton (Titmuss and Grundy) 687, *see also* Infertility
Fibrin-film, 918
Fibrin-foam, 918
Fibrinolysis (Macfarlane and Pilling) 562, (Macfarlane and Biggs) 862
Fibromatosis and hormones (Iglesias and Lipschutz) 488, (LA) 797
Figures, facts, and fancies (Douglas) (C) 289
Filing of medical photographs (Hansell) 297
Films—catalogues of, 888, on microbiology and protistology, 36

FILMS—Children on Trial 439; Hydatid Disease of Liver, 814, Neurological Sequelæ of Deficiency Disease seen in ex-Prisoners of-war, 814, Scabies 1946, 475; Sister Kenny, 853; This Town is Ours, 814

Filmstrip (Hansell) 297
Findlay, G. M.—on control of insect-borne diseases, 23; penicillin in yaws, 522
Finland, visit to (Gurassa and Jackson) 431
First-aid—Casualties Union 929; *First Aid to Injured* (R) 908; *for apparently* drowned, 542; Ship Captain's Medical Guide (R) 529
Fischer, A., Biology of Tissue Cells (R) 678
Fish (A) 390
Fishbein, M., Medical Uses of Soap (R) 718
Fisher, A. C., *epidemic* thrombophlebitis (C) 438
Fistula, arteriovenous (Haile) 85
Five-day fever (A) 914
Flagella (LA) 871
Fleming, Sir A.—awarded Brazilian order of Southern Cross 440, gold medal of Royal College of Surgeons of England, 765, gold medal of Society of Apothecaries of London, 368, 853, Harben gold medal, 147; Penicillin: its practical application (R) 678
Fletcher, F.—folic acid in pernicious anæmia, 156; sulphonamide granulopenia in children (C) 924
Florey, M. E., penicillin in wound exudates, 405
Florey, Sir H., awarded gold medal of Society of Apothecaries of London, 368, 853
Flour—chalk in national, 245, (Graham-Little) (C) 254, (Harris) (C) 546, (P) 577, (Harris) (C) 849; digestibility of high-extraction wheaten (Booth and Moran) 119, (A) 126; extraction (P) 577, (P) 962; rationing of (P) 29; white, for invalids (P) 178; *see also* Bread
Floyer, M., test-meals, 350
Fluids in heart-failure (A) 54
Fluker, J. L., treatment of meningitis (C) 435
Fluorine—hazards (Murray and Wilson) 821, (LA) 835, (P) 887; in water-supplies (A) 167
Fodden, J. H., malignant granuloma of nose, 596
Fœtus—bones of, in urinary bladder (Forshaw) 716; models in teaching delivery and rotation of head of (de Seigneux) 302; respiration of (A) 570
" Fog disaster " (LA) 835
Fogh-Andersen, P., Inheritance of Hare-lip and Cleft Palate (R) 122
Folic acid—(Angier) (C) 288, (LA) 680; in cœliac disease (Brody and Gore) (C) 618, (Dalton, Thomson, and Wilson) (C) 652; in megaloblastic anæmia (Davidson and Girdwood) 373; in pernicious anæmia (Wilkinson, Israëls, and Fletcher) 156, (Davidson and Girdwood) 373, (Harrison and White) 787; in tropical sprue (Manson-Bahr and Clarke) 903
Food—bulletins for hospitals, 510; consumption of, in U.K. (P) 658; dangers of raw meat, 854; effect of meals on electrocardiogram (A) 762; Food and Agriculture Organisation, 463, 550; Food and Nutrition (Cruickshank) (R) 530; for premature baby (LA) 240; from sea (A) 390; frosted (A) 646; gifts for hospitals (P) 218; in British zone of Germany (P) 68, (P) 731, (A) 759, (P) 772, (P) 851; in Finland (Gurassa and Jackson) 431; in mental hospitals, 690; infected (LA) 607, (Hutchinson) (C) 693; medicine, and population (LA) 349; *parcels for Europe (P) 851*; rations for Germany, 475, (P) 772; welfare foods, 211; world cereals (P) 851; world harvest (A) 683; world shortage of (A) 206, World's Hunger (Pearson and Harper) (R) 794; *see also* Bread, Diet, Flour, Milk, Nutrition, Rations
Foot, *see* Feet
Foote, R. R, retractor for varicose veins (NI) 162
Forbes, F. A., visual defects in prisoners-of-war, 149
Forbes, J. R., myth and mumpsimus, 293
Forceps, muscle, for squint operation (Klein) (NI) 907
Ford, E B, on birth-control, 852
Fordham, M., psychoneurosis treated with electrical convulsions (C) 694
Forensic Medicine (Kerr) (R) 530
Forensic pharmacy—Textbook of Forensic Pharmacy (Dewar) (R) 348
Form and function (A) 126
Forshaw, H. W., fœtal bones in urinary bladder, 716
Foss, G. L, phosgene poisoning, 670
Foundlings, birth certificates of (ML) 771
Fowler, P. B. S, syndrome simulating acute abdominal disease (C) 884
Fox, J. T., pyridoxine in epilepsy, 345
Fractures—Complete Outline of Fractures (Bonnin) (R) 348; compound, prophylactic penicillin in (Power) (C) 32; new fracture bed, 778; of cervical spine, zygomatic traction for (Batchelor) (NI) 202
Fraenkel, G. J., prophylactic penicillin in surgery (C) 64
Fragility, capillary (A) 16
France, care of aged in (Amulree) 802
Francis, G. E, vitamin-C survey of medical *students, 938*
Frankel, E. L., syndrome simulating acute abdominal disease (C) 884
Franklin, K. J., renal pathology, 237
Fraser, R. M., myth and mumpsimus (C) 506
Fraser, Sir F., on postgraduate education (LA) 91
Freund, Prof. Ernst (Pearson) (C) 102
Friend, G. E., bread rationing (C) 102
Frisk, A. R., penicillin via fallopian tubes, 118
Frosted food (A) 646
Fuld, H., on gastrectomy for peptic ulcer, 832
Fulton, J. F., Howell's Textbook of Physiology (R) 3·4
Function and form (A) 126
Fungi, 543
Funiculitis (Castellani) (C) 398
Future for Preventive Medicine (Stieglitz) (R) 642
Gaisford, W. F., treatm
(C) 253
Gallagher, E., cultures in female
(C) 63
Gamma rays—Actions of
Living Cells (Lea) (R) 492; bombs (LA) 14, (LA) 124
Gardner, F., length of *stay in h*
Gardner, L. U. (O) 736
Garland, H., arsenical enceph
809
Garven, H. S. D., *Demodex foll*
nipple, 44
Garvie, A., periodicity of infin
Gastrectomy for peptic ulcer, 83
Gastric extracts in peptic ulcer (
272
Gastro-enteritis, infantile, 92,
in maternity homes, 962
Gastro-enterology—Roentgen
Diseases of Gastroin
(Farrell) (R) 238
Gause, G. F., gramicidin S, 46
Gauvain, S., calciferol and
adenitis (C) 921
Gazelle boy, 929
Gelatin models in teaching (de
302
Gellebter, S., glandular fever
myelitis, 753
Gemmell, A. A., on afte
plastic operations, 793
Gemmill, W., death of, 168.
General Board of Control for
General Medical Council, 181,
General Register Office, 601
Genetics—effects of atom bo
Inheritance of Hare-lip and
(Fogh-Andersen) (R) 122
Geneva Convention, revision
Geriatrics, *see* Aged
Germany—806; Control Co
danger of famine in (P) 73
experiments on prisoners
(Mellanby) (C) 850, (Kle
(C) 961; food in British
(P) 731, (A) 759, (P) 851;
25; nutrition in, 22, (P)
for Germans, 475, (P) 77
rations of prisoners of-war
(Leyton) 73; Ruhr, 136;
25; welfare work in British
Gerocomy (Howell) (C) 214
Gerontology, *see* Aged
Gifford, S, Textbook of Op
(R) 12
Gillie, A, women in medicine
Gillis, L, hernia through
Winslow, 48
Gillman T, and Gillman, J.,
infantile pellagra, 446
Girdlestone G. R., prophyla
in surgery (C) 102
Girdwood, R. H, folic acid in
anæmia, 373
Girlhood—Psychology of Wom
(R) 946
Glaister J. N., psychoneurosis
electrical convulsions (C) 61
(C) 885
Glands—abdominal lymphaden
dren (Baker and James)
culous, treated with calcifer
88, (Wallace) (C) 473, (J
(Bell) (C) 808
Glandular fever (Gellebter) 753.
Glaser E M, psychiatry in
(C) 73
" Gleam " 845
Glover, R. E., influenza B in 19
Gloves, rubber (Graham-Bonn
Gloyne, S. R., on pulmonary
383
Glucose (Forbes) 295
Glyn Hughes F., on sulphona
Goitre—intrathoracic, *sign of*
(C) 509; toxic, treated with
iodine (A) 166
Gold salt death after (ML) 925
Goldstone, B. W., syndrome
acute abdominal disease, 267,
Goll R. E., on employment
handicapped, 764
Gonorrhœa—female, cultures i
(C) 3, penicillin in (Ma
(Sandes) (C) 810, (Michael
847; oral penicillin in (B
Harkness) 783, (LA) 796;
gonococci (Parker) (C) 850;
thiazole in 677
Gooding, C G., pneumoconiosis
891
Goodman, N. M.—appeal for
364, appointment, 952; Wor
Organisation 358
Gra skin reflex in malnutrition
(C) 471

Howard, C., myth and mumpsimus (C) 397
Howell, T. H., new words about old age (C) 214
Howell's Textbook of Physiology (Fulton) (R) 384
Howie, J. W., teacher's income (C) 768
Hubacher, O., peptic ulcer treated with gastric and intestinal extracts, 272
Hughes, R. A., bovine plasma (C) 579
Hugo, H. F. L. (C) 474
Human Biochemistry (Kleiner) (R) 678
Humphrey, J. H., penicillin inhalation in pulmonary disease, 221
Humphreys, Sir T., on birth-control, 852
Hunting in Germany, 25
Hutchinson, R. I., infected food (C) 693
Hyaluronidase in fertilisation, 765
Hydatid Disease of Liver (film), 814
Hydrolysates—casein, as supplementary food for premature infants (Jorpes, Magnusson, and Wretlind) 228, (LA) 240, (Mackay) (C) 400; protein, in infantile pellagra (Gillman and Gillman) 446
Hydrotherapy—Everybody's Way to Health and Fitness (Togna) (R) 12
Hygiene in Middle East, 691
Hynes, M., serum-protein level of Indian soldiers, 590
Hyperplasia (LA) 797
Hypertension—and calcium intake (Kesson and McCutcheon) 793, (Harris) (C) 849; Studies in Hypertony and Prevention of Disease (Harris) (R) 794, (Harris) (C) 849
Hypertonie de décérébration chez l'homme (Mollaret and Bertrand) (R) 456
Hypomenorrhœa, nicotinic acid in (A) 534
Hypoproteinæmia (A) 914

I

Ibrahim, H., peritoneal nodules, 346
Ice-cream—chemical standard for (P) 887; control of (A) 571; danger from (A) 277, (A) 391; *see also* Typhoid fever
Ichthyosis, 263
Icterus gravis neonatorum (Third) 635, (Parsons) (C) 807, (Bowley) (C) 848, (Third) (C) 922
Iglesias, R., hormones and fibromatosis, 488
Illegitimates—birth certificates of (ML) 771; mothers of (A) 836
Illingworth, R. S., appointment, 585, 625
Immunisation—against diphtheria (P) 135, 147, (Boyd) 195; with vole bacillus (A) 17; *see also* B.C.G.
Immunity—Topley and Wilson's Principles of Bacteriology and Immunity (Wilson and Miles) (R) 12; use of human blood derivatives for transfer immunity, 870
Income-tax and medical expenses (P) 30
Index Catalogue (A) 168
India—epidemic kerato-conjunctivitis in Bengal (Thorne) 715; famine in, 60; harvest in (A) 683; opium traffic in, 510; psychiatric disability among British officers in (Tredgold, Kelly, Heffernan, and Leigh) 257; serum-protein level of Indian soldiers (Hynes, Ishaq, and Morris) 590; training of Indian nurses in Australia, 662
Indies, East—malaria transmission in Borneo (McArthur) 117
Indies, West—nutrition in (A) 128, (Thrower) (C) 288
Indole-3-acetic acid (Kodicek, Carpenter, and Harris) 491
Industrial health—diploma in, 70; in Croydon, 660; research (Keatinge and Davies) (C) 179
Industrial medicine, prospects in, 504
Industrial safety and medicine (Levy) 20
Industrial Welfare Society, 965
Industry—and fluorosis (Murray and Wilson) 821, (LA) 835; disabled in (P) 773; epididymitis, non-specific, in (Whitwell) (C) 360

IN ENGLAND NOW.—Aden, Gulf of, 101—Africa, South, 100—Anatomy, teaching of, 329—Appointments, candidates for, 136—Army, medical grading in, 651, specialists in, 330—Awards, compensation, 283—Band music, 60—Binaural hearing, 212—Birthdays, 330—Bottling of fruit, 252—Boys and police, 729—Bread, 505—Brides, Canadian, 100—Britain Can Make It exhibition, 469—Broadcasters, drugs for, 958—Canadian brides, 100—Cancer cases, follow-up of, 357—Candidates for appointments, 136—Car, German, 25—Career, medical, reasons for adopting, 358—Certificates, milk priority, 614, 692, 957—Changes in England, 729—Chinese hospital, 767—Club, girls', visits Tower of London, 251—Club, Sparrows, 25—Compensation awards, 283—Conferences, health, 251—Control Commission of Germany, 396—Convalescent homes, 578—Deadly nightshade, 578—Dimethyl phthalate, 434—Doctor's waiting-room, 284—Drowning, resuscitation from, 542—Drugs for broadcasters, 958—Dutch school, 25—England, changes in, 729—Examinations, 60, 330—Exhibition, Britain Can Make It, 469, medical, 845—Famine, in India, 60, in Ireland, 542—Fear of venereal disease, 505—Fly-fishing, 60—Fœtus, disposal of, 921—Fruit-bottling, 252—Fungi, 543—German motor-car, 25—Germany, 806, Control Commission of, 396, *hunting in*, 25—*Girls' club visits* Tower of London, 251—"Gleam," 845—Grading, medical, in Army, 651—Gulf of Aden, 101—Harvest mites, 434—Health conferences, 251—Hearing, binaural, 212—Hitler's neurological state, 920—Homes, convalescent, 578—Hospital, Chinese, 767, L.C.C., 651, "walking," 881—Hotel in Washington, 136—Hunting in Germany, 25—Hygiene in Middle East, 691—Ice-cream carrier, 358—India, famine in, 60—Irish famine, 542—Java, 174—Law and medicine compared, 578—L.C.C. hospital, 651—Maize, 542—Medical career, reasons for adopting, 358—Medical exhibition, 845—Medical grading in Army, 651—Medical statues in London, 881—Medically overcrowded area, 357, 433—Medicinable, 396—Medicine and law compared, 578—Medicine, teaching of, 329—Middle East, hygiene in, 691—Milk priority certificates, 614, 692, 957—Mites, harvest, 434—Motor-car, German, 25—Mushrooms, 543—Music in park, 60—Nightshade, deadly, 578—Nurses, 881—Outpatients, 211—Perforated peptic ulcer, 845—Pipe smoking, 651—Police and boys, 729—Resuscitation from drowning, 542—Roosevelt memorial, 845—Rubber shortage, 729—Ruhr, 136—Salaries, 767—School, Dutch, 25—Sigmoidoscopy, preparation for, 396—Smallpox, 211—Smoking, 651—South Africa, 100—South African Medical Council, 767—Soya bean, 806—Sparrows Club, 25—Specialists in Army, 330—Squatters, 505, 614—Statues, medical, in London, 881—"Swanning," 543—Switzerland, 468—Teaching of anatomy and medicine, 329—Testimonials, 614, 729—Thames steaming, 136—Toadstools, 543—Tower of London, 251—Traffic jams, 60—Vaccination, 252—Venereal disease, fear of, 505—Volkswagen, 25—Waiting-room, doctor's, 284—"Walking hospital," 881—Washington hotel, 136—White, Gilbert, 434—Words, 806

Infant mortality, *see* Vital statistics
Infantile gastro-enteritis, 926, in maternity homes, 962
Infantile paralysis, *see* Poliomyelitis
Infants, *see* Babies, Children
Infection spread by dust (LA) [illegible]
Infectious diseases—Anémie infectieuse (Hemmeler) (R) 492; control of, 23; epidemiology of (Tomb) (C) [illegible]; in nurseries (Menzies) 499; streptococcal throat infections (LA) 164[illegible]; weekly lists of, 31, 59, 100, 145, [illegible], 255, 287, 320, 350, 395, 434, 470, [illegible], 541, 584, 614, 659, 695, 728, [illegible], 841, 880, 926
Inferior vena cava, thrombosis [illegible] (Stowers and Grossman) 868
Infertility—artificial insemination in, 756; male, investigation of (Bourne) (C) 923; *see also* Sterility
Infestation Control: Rats and Mice (A) 950
Influenza—B (LA) 644, among West Indians (Jackson) 631, in 1945–46 (Dudgeon, Stuart-Harris, Glover, Andrewes, and Bradley) 62[illegible]; chemotherapy of (A) 277; periodicity of (Garvie) (C) 652; research on (A) 951; treated with sulphathiazole, 677
Ingram, J. T., dangers of calciferol (C) 960
Inheritance of Hare-lip and Cleft Palate (Fogh-Andersen) (R) 122
Injuries of the Knee Joint (Smillie) (R) 162
Insanity, *see* Lunacy
Insect-borne diseases, control of, 23
Insecticides—DDT, the Synthetic Insecticide (West and Campbell) (R) 238; patentability of, 331
Insemination, artificial, 756
Institute of Almoners (LA) 241
Instruments, scientific, 292
Insurance—Insurance Acts Committee (A) 166, (A) 388; *see also* National Health Insurance
Intelligence, distribution of, 198, (LA) 204
Intercellular fluid (A) 914
Interdepartmental Committee on Scientific Instruments, 292
International Medical
Intervertebral [illegible]
[illegible]balgies (Putti-Dutaillis) ( )
Intestinal extracts in pep
(Hubacher) 272
'Intocostrin,' 80
Introduction to Clinical Neurology (
(R) 456
Introduction to Clinical P
(Traquair) (R) 642
Introduction to Clinical Surgery (S
908
Iodine, radio-active, in toxic goitre
Iraq—Royal College of Medicine,
404, 468
Ireland—*Epidemic of poliomye*
Eire (Deeny and MacCorma
famine of 1846, 542; mental d
in Northern Ireland, 727
Irvine, G., new words about old ag
Ishaq, M., serum-protein level of
soldiers, 590
Isotopes, radioactive (LA) 24
see also Tracers
Israëls, M. C. G., folic acid in p
anæmia, 156
Italian medical students' associatio
Italy, Q fever in (LA) 644
Itter, W., male nurses (C) 254
Ives, A. G. L., responsibility for
sick, 915
Ives, L. A., testimonials (C) 695

J

Jackson, F. L., visit to Finland, 4
Jackson, H. B. (C) 583
Jackson, L. N., left turn (C) 849
Jackson, M. H., on artificial inse
756
Jackson, W. P. U., influenza B amo
Indians, 631
Jacobsen, E., on reticulocytes, 383
James, U., abdominal lymphade
children, 232
Jamieson, E. B., Illustrations of
Anatomy (R) 304
Janeway, C. A., appointment, 36
Jarman, T. F., tuberculous gla
calciferol (C) 580
Jaundice—diagnosis of (LA) 947;
cal tests of liver function (
451; homologous serum, 384;
gravis neonatorum (Third) 635, (
(C) 807, (Bowley) (C) 848, (Third
Java—174; prisoners-of-war in
and Forbes) 149
Jennings, D.—desoxycortone and
(C) 101, (C) 364; test-meals, 35
Jephcott, H., efficacy of penicillin
Jessel, G. (C) 69
John, H. J., Diabetes (R) 908
Johnston, L., on sulphonamides, 6
Johnstone, R. D. C., 'Paludr
relapsing benign tertian malaria,
Joint Chemical Committee on Pate
Joint Tuberculosis Council, 738
Joints—arthrodesis of hip (Pat
Atlas of Surgical Approaches t
and Joints (Nicola) (R) 566; In
the Knee Joint (Smillie) (R) 16
lesions in skeletal tuberculosis
744; synovial membrane of
815; *see also* Arthritis
Jones, F. A., splanchnic block fo
(C) 365
Jones, R. N., anuria treated b
decapsulation and peritoneal
749
Jones, T., Manual of Surgical
(R) 304
Jorpes, J. E., casein hydroly
premature infants, 228
Joseph Rogers prize, 303
Joules, H., penicillin inhalation
monary disease, 221
Journal of General Microbiology, 92
Journal of History of Medicine an
Sciences, 550
Journal of Tropical Medicine and E
107
Journals—appeal for medical and
(Goodman) (C) 361, new, *Abst*
World Medicine (A) 278, *Abst*
World Surgery, Obstetrics, and G
logy (A) 278, *American Practition*
Anæsthesia, 476, 549, *British*
of Nutrition, 929, *British Jour*
Pharmacology and Chemotherapy (
British Journal of Social Medic
278, *British Medical Students' J*
331, *Nutrition and Child Welfa*
Nutrition Bulletin, 965, *Thorax* (A
wanted abroad, 475, World L
Scientific Periodicals, 813
Juvenile Delinquency in New
(Philipp) (R) 832

in cœliac disease

ents with Mam
a (R) 384
ic kerato-conjunc

of, 685, (O) 736
ptococcal (LA) 164 ;
, Ear, Nose, and
man, Crowe, and

demic (Manson-Bahr
Fisher and Lendrum)
883
Anticoagulants in
dults (Newman) 409 ;
cava (Stowers and
ontaneous mesenteric
of, (Lambert) (C) 63
, Indies (C) 288
t (Maizels) 451
rathoracic, sign of
9
tive iodine in (A)
(A) 207, 368, (Holten)

don) (C) 735
lymphocytic menin-
ar fever, 819
s, 812

logy of Tissue Cells
8
ak) (C) 883
rtility survey, 687
agement of Obstetric
304

to defæcation (C) 362 ;
of Growing Old (R) 162
rybody's Way to Health
12
idemiology of infectious

prisoners-of-war (Mitchell

4
choneurosis treated with
lsions (C) 615
's Principles of Bacterio-
nity (Wilson and Miles)

New Towns Bill (P) 105
2 ; see also Isotopes
l employment, 332, (A)
) 886, 917
édique de la paralysie
) (R) 162
calf plasma or serum
(A) 355, (Edwards) (C)
) 579
Introduction to Clinical
342
nic (Moody) 934
spital photographic de-
9
ining industry (P) 69 ;
nent Year Book 1946
715 ; Year Book of
eutics (Bethea) (R) 50
, psychiatric disability
fficers in India, 257
914
rine" (C) 361
tors (A) 798
periodide, 889

dren who spend too long

681
hamlet at, 585
's Tropical Diseases (Man-
304 ; Pathology of
ses (Ash and Spitz) (R)
in tropical medicine,
473 ; tropical diseases, 23,
tropical eosinophilia in
) 236 ; Tropical Nutrition
Nicholls) (R) 604
athology, 237
24

e Scrub-typhus
; allowances, 811,
G. (LA) 129, 153, (Tytler)
395, (Ellman) (C) 435,
e (P) 659, mortality from
lciferol in (Wallace) 88,
473, 528, 529, (Jarman)
(C) 808, (Gaurain) (C)
therapy of, 99 ; high-
ment of, 465 ; home
uberculous persons (Dick
n) 791 ; immunisation
us (A) 17 ; in China, 403 ;
) 278 ; in Finland, 432 ;
spitals, 690 ; in miners
; in Newfoundland (A)
and (Daniels) 537 ; in
Vienna (P) 659 ; Joint Tuberculosis Council, 738 ; lung lesions in skeletal tuberculosis (Mann) 744 ; lupus vulgaris, treatment of, 528 ; mass radiography (P) 928 ; morbidity, 90 ; mortality during war (A) 390 ; murine (A) 17 ; of nervous system, 525 ; patients and priority milk (P) 178 ; Phénomènes d'allergie non spécifique dans la tuberculose et les fièvres typhoïdes (Albert-Weil) (R) 908 ; Preston Hall, 70 ; primary pleurisy with effusion, 89 ; psychology of tuberculous (Day) 703 ; pulmonary, amphetamine in (Houghton and Corrigan) 864, in prisoners-of-war (Mitchell and Black) 855, in Rand miners (A) 952, psychology of (A) 875, relation between primary and adult, 382, (Pagel) (C) 471 ; rations for tuberculous, 36, (P) 217 ; reablement of tuberculous (Tattersall) 37, (A) 128 ; refresher course, 519 ; research (Newell) (C) 210, (Heaf) (C) 292 ; service and future (Tattersall) 37 ; streptomycin in tuberculous meningitis (Cairns, Duthie, and Smith) 133 ; treatment of (Brailsford) (C) 939 ; tubercle bacilli in cerebrospinal fluid, 528, (Roberts) (C) 769, (Shamyeh) (C) 810 ; Tuberculosis Educational Institute, 519 ; tuberculous abscess following intramuscular penicillin (Ebrill and Elek) 379, (Marsh) (C) 508, (Hounslow) (C) 617 ; tuberculous endometritis and sterility (A) 354, (Sharman and Sutherland) (C) 506 ; tuberculous glands and sinuses treated with calciferol (Wallace) 88, (Wallace) (C) 473, (Jarman) (C) 580, (Bell) (C) 808, (Gaurain) (C) 921 ; tuberculous pericarditis, diagnosis of (A) 245 ; under National Health Service, 728 ; Victor Chetwynd Tuberculosis Fund, 403 ; work for tuberculous (A) 128
Tubocurarine chloride (Trevan) (C) 361 ; in anæsthesia (Prescott, Organe, and Rowbotham) 80
Tucker, W. E., London College of Osteopathy (C) 145
Tullidge, G. M., pyridoxine (vitamin B_6) in epilepsy, 345
Tumours—experimental tumorigenesis (LA) 797 ; see also Cancer, Sarcoma
Turner, A. C. F. (O) 402
Turner, G. G., perforated peptic ulcer treated without operation (C) 693
Turner, J. W. A., polyarteritis nodosa and syphilis (C) 143
Turton, E. C., penicillin in wound exudates, 405
Twort, J. M., avoidable cancer (C) 215
Typhoid carriers—detection of, 286 ; treated with penicillin and sulphathiazole (Comerford, Richmond, and Kay) 343, (A) 353
Typhoid fever—outbreak at Aberystwyth, 211, 255, 287, 329, 434 ; Phénomènes d'allergie non spécifique dans la tuberculose et les fièvres typhoïdes (Albert-Weil) (R) 908 ; Sir A. Wright and anti-typhoid inoculation (Colebrook) (C) 397, (Guthrie) (C) 581, (Smallman) (C) 694 ; sulphathiazole and penicillin in (McSweeney) 114, (A) 358, (correction) 476
Typhus—louse-borne (A) 914 ; radiographical opacities in chest in, 431 ; research (LA) 531 ; see also Scrub-typhus
Tytler, W. H.—B.C.G. (C) 180 ; on pulmonary tuberculosis, 383

U

Ucko, H., persistent enuresis (C) 400
Ulcer, see Peptic ulcer
Ulcerative colitis—psychotherapy of (West) 890 ; treated with thiouracil (Martin) 944
Unemployment among doctors (Graham-Little) (C) 180
Ungar, J., on pertussis, 50
United States of America, see U.S.A.

UNIVERSITIES.—Birmingham : chair of medicine, 182, obstetrics and gynæcology, 182, pædiatrics and child health, 182, 220, surgery, 182, 220 ; degrees, 71—Cambridge : appointments, 367, 888 ; degrees, 35, 71, 292, 585, 661, 737, 813, 888 ; postgraduate school (A) 836 ; Rockefeller Foundation grant to, 147—Dublin : degrees, 71, 147, 183, 888—Durham : chair of oral medicine, 256 ; degrees, 71 ; research fellowships (A) 97—Edinburgh : appointment, 439 ; Cameron prize, 182 ; chair of child life and health, 292, midwifery and diseases of women, 219 ; degrees, 182, 930 ; diplomas, 182, 701, in industrial health, radiodiagnosis, and radiotherapy, 966 ; extension of premises, 504—Glasgow : appointment, midwifery, 183 ; degrees election of chancellor, 81 chair of medicine, 550, pe surgery, 550—Leeds : a 853 ; chairs of biochem new, 182, of pædiatrics ; psychiatry, 182, 292, surger, postgraduate course, 511—Liv pass-list, 71—London : appoir ts, 182, 549, 661, 813 ; chairs of bact gy, 256, 291, clinical pathology, 2 , 367, dental medicine, 661, embryol y, 291, experimental biochemistry, 51 human nutrition, 291, medicine, 549, 813, morbid anatomy, 403, obstetrics and gynæcology, 256, physiology, 256, 367, surgery, 291, tropical medicine, 182, 220 ; pass-lists, 35, 182 ; retirements, 182—Manchester : chair of chemical physiology, 182, physiology, 182, surgery, 853 ; pass-lists, 71, 147, 968 ; proposed liaison with Strasbourg, 328—Oxford : appointments, 35 ; degrees, 35, 71, 219, 661, 853 ; Nuffield scholarships, 737 ; salaries of professors, 35—Princeton : honorary degrees, 777—Queen's University, Belfast : degrees, 147 ; pass-lists, 71—Sheffield : appointments, 585, 737, 929 ; chair of bacteriology, 256, child health, 585, 625, physiology, 625 ; pass-list, 511—Strasbourg : proposed liaison with Manchester, 328

Universities—expansion of (A) 205 ; Scottish, by-election, 585, 738
University Grants Committee (A) 205, (P) 217
University students, 236
UNRRA (P) 772, (A) 799
Upholstery, 961
Uræmia (Darmady) (C) 581, (LA) 920, (Reid, Penfold, and Jones) 749, (Parke) (C) 847, (Danziger) (C) 848
Urea-formaldehyde resins in orthopædic surgery (Collinson) (C) 215
Urinary bladder, fœtal bones in (Forshaw) 716
Urinary tract, effect of sex hormones on (Ucko) (C) 400
Urine—detection of amino acids in (Dent) 637 ; excretion of (Verney) 739, 781 ; extraction of penicillin from (LA) 757 ; of infants, 464
Urogastrone (Hubacher) 272
Urology, 173
U.S.A.—American Rheumatism Association (A) 570 ; Army centre for deaf, 888 ; Army operational ration, 889 ; cancer instruction in, 930 ; dietary, 291 ; effect of war on medical education in, 4 ; group practice in (A) 311 ; harvest (A) 683 ; hospitals and health centres in, 475 ; medical education in, 4, (A) 498 ; mental health in (A) 56 ; milk industry in North America (A) 127 ; rheumatism in (A) 570 ; scientific books published in, 1930–44, 287 ; shortage of scientists in, 778
U.S.A. National Research Council and streptomycin, 35
Usborne, V. M., women in medicine (C) 471
Use and disuse, effects of, on nerve and muscle (Young) 109
U.S.S.R.—B.C.G. in, 778 ; harvest (A) 683 ; Russian scientists visit Britain (P) 30
Ustvedt, H., on pulmonary tuberculosis, 382
Uterus—cancer of corpus uteri (A) 647, (correction) 702 ; fibroids of (LA) 797 ; hæmorrhage from (A) 460, (Levy) (C) 546 ; Pólipos Cervicais e Afecções Polipoides do Colo do Útero (Dutra) (R) 12 ; Technical Minutiæ of Extended Myomectomy and Ovarian Cystectomy (Bonney) (R) 420 ; tuberculous endometritis and sterility (A) 354

V

Vaccination—(Boul and Corfield) 234, 332, (LA) 350, (Millard) (C) 362 ; fees, 252
Vaccine—antirabic, myelitis after (Russell) 826 ; pertussis (A) 685 ; plague (A) 462
Vaginal plastic operations, aftercare of, 793
Vagus function after leucotomy, 907
Valgus foot strain (Bailey and Harrens) 490
Van den Ende, M., accidental laboratory infection with tsutsugamushi rickettsia, 4
Vannotti, A., on physiology at high altitudes, 405
Van Someren, E. H., 440
Varicella, arsenical (Weber) (C) 402, (Reah) (C) 507, (Craddock) (C) 545
Varicose veins, retractor for (Foote) (NI) 162
Variola, see Smallpox
Vaughan, J., on homologous serum jaundice, 354
Veins, varicose—retractor for (Foote) (NI) 162 ; see also Thrombosis